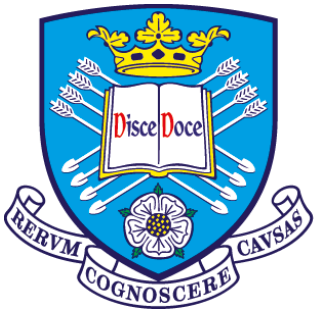

The University Of Sheffield.

School of Education

Pedagogical affordances and challenges of tablets:
How can the Charter for 21st century literacies support tablet-mediated teaching and learning?

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Submitted in partial fulfilment of the Doctor of Education degree

School of Education

January 2020

“Liberating education consists in acts of cognition, not transferals of information.”

Paulo Freire, Pedagogy of the Oppressed,
New York: Continuum Books, 1993

Acknowledgements

I would like to express my gratitude to all those who in some way or another contributed in the process of this study.

My sincere appreciation and gratitude go to my supervisor, Professor Jackie Marsh for her invaluable guidance. I have been extremely lucky to have a supervisor who is an expert in this area and who responded to my queries promptly. I would like to thank my former supervisor, Professor Kate Pahl, for encouragement and guidance she has provided throughout my time as her student. I also thank Dr Rebecca L. Parry, Director for the Ed.D Programme for her great support and input throughout my studies.

I acknowledge the partly financial support for the course of the Endeavour Scholarship Scheme administered by the Scholarships Unit Programme Implementation Directorate within the Ministry for Education and Employment of Malta.

Special thanks and appreciation are due to the Head of School, the teachers and students who took part in this study. The observations period enabled me to appreciate more the challenges teachers face.

Finally, I am truly grateful to my wife Mary Grace and my three children, Aislinn, Cedric and Riona for their everlasting encouragement and support. They helped me a lot to reach this stage in my life.

Abstract

This work set out to explore the pedagogical practices that are developing through the use of tablets in relation to literacy learning. Presently this is the Ministry of Education's top strategic priority in Malta. Whilst this study acknowledges that tablets are not a quick-fix solution to major language and literacy problems, it explores the advantages and the challenges involved in using tablets in the classroom. The study also aims to present a critical review of pedagogical practices with regard to the use of tablets in order to identify those practices that can make a positive contribution to children's literacy learning.

In order to fulfil this aim, I conducted an empirical study in two classrooms of a Maltese state school between February and June 2016. In two small classrooms, 11 students were observed in depth, and the use of tablets was video-recorded and / or photographed. Children also captured photographs of their tablet-focused lessons and these informed discussions with them. My approach was interpretivist and qualitative data were generated during the lessons observed.

The key findings are that in the school that was the focus for this study, there were a number of benefits of using tablets in the classroom, and some challenges faced. The advantages of tablets in the classroom were their portability, which allowed children to roam about in the classroom and provided more autonomous learning; their touch screen facility, which allowed for an easier and more intuitive interaction for young children, and their facilitation of the use of a number of open-ended apps which facilitated the use of Maltese language. The challenges for teachers were related to managing the integration of tablets as relatively new technology into teaching and learning, as well as choosing the right apps for learning. Being portable devices, they posed more risks of being dropped and damaged by young children, adding to

other costs involved including purchasing of apps. In addition, the study found that pedagogical practices demonstrated by the teachers were largely in line with those identified in the field as effective, such as the promotion of multiliteracies, engagement with a range of modes and media, and collaboration. However, the study also identified that some areas were less well developed, such as the use of playful pedagogies, innovation and experimentation, and critical thinking. The implications for teacher education in Malta are considered.

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Chapter 1:
Introduction

1.1 Introduction

This thesis seeks to analyse the emerging role of tablets in the classroom in Malta, shedding light on their pedagogical use to support and enhance litercy skills. One of its major aims is to establish whether through the use of tablets, teachers can reach their pedagogical aims. Another aim is to explore how tablets can facilitate and enhance the acquisition of literacy skills by students. Santori & Smith (2018, p.25) state that research is needed which shows how effective tablet-mediated teaching and learning is, as research that highlights, "how it supports the development of multiliteracies" is still limited. Simpson & Walsh (2017, p.68) also remark that, "there has been little research into the modal complexity offered by this learning device that takes into account the context in which learning takes place." Flewitt, Messer, & Kucirkova, (2015, p.292) reiterate that "to date, very little is known about how touch-screen technologies can be used to enhance classroom-based early literacy learning." Some years have passed since Burnett (2009) stated that there is, "very little research that examines new literacies within the context of primary classrooms", but in Malta little has changed so far and very little research has been carried out locally regarding the 'educational use' of tablets, with the exception of the recent study "Information Technology Audit: The Effective Use of Tablets in State, Church and Independent Primary Schools", conducted by the National Audit Office (2019). Tablet technology is actually relatively new and therefore it is hardly surprising that research on tablets is recent and ongoing. Apple Ipads were launched in January 2010 (Smith & Evans, 2010) and Android, now the most popular mobile operating system, was still in its infancy. Despite the novelty of tablets and their use in the classroom, an emerging literature

base (reviewed in this thesis) explain the mechanisms involved in tablet-mediated learning and demonstrate the strong evidence of the positive impact of tablets to enhance student learning.

The inception of this research stemmed from my concern that, despite the State's initiative to invest in tablets for primary school students, with plans to pursue this project in middle and secondary schools, the ultimate outcome depends on understanding the pedagogical affordances of these devices as well as the challenges that teachers may face. This may also entail constructive approaches to teaching and learning.

This thesis, therefore, aims to shine a light of enquiry into this field, so that the foundational aspects of this nascent body of knowledge can be developed and informed by an analysis of good practicies and also difficulties in a real classroom environment. Further research to determine whether tablets actually improve literacy outcomes would require a longitudinal study, which so far has never been conducted in Malta. Thus, the principal aim of this study is to explore the affordances of the tablet as an educational tool and the experiences of children when using tablets in a classroom.

1.2 Positioning the researcher

This research focuses on the pedagogical affordances of tablets and the challenges for teachers in managing tablet-mediated teaching and learning. These are the preoccupations which have given rise to this research. Due to the contiguity of this research with my career and my professional development, including my Masters in this field, I feel it is sensible to share my own pathway to the study.

My adventure with digital literacy began at the moment I started working as a regular teacher, at that time using the school multimedia room. The room had to be booked beforehand, at a time when the notion of constant access to I.T and multimedia in the classroom was inconceivable. With virtually no technologies present in class, I experimented with the flipped classroom concept, where I provided notes and pages from books and later on my website while testing activities were conducted in class. When I became an ICT teacher, the PCs in the lab provided more opportunities for Web2 tools and hands-on experience.

I am a teacher by profession and was appointed as a regular teacher in September 1999. For twelve years I taught in two secondary schools. Before the 2010 reform, 'area secondary' schools were distinguished from 'Junior Lyceum' schools, which were introduced in 1981 to stream better performing students from others. This experience enabled me to better reflect how to deal with challenging behaviour and use differentiated learning techniques. I always believed that Information and Communication technology could enhance learning and motivate my students. At that time, we were witnessing the change from blackboards to whiteboards and desktops were being introduced in schools.

The benefits of mobile technologies in education were the subject of my Masters in Information Technology dissertation. The principal purpose of this dissertation (Seguna, 2010) was to investigate how mobile phones can be used in the teaching and learning of basic skills in mathematics. This was undertaken by observing some of my students who had not managed to acquire the necessary literacy and numeracy skills. They were very enthusiastic about using mobile phones applications - at that time Java applications were most popular. Mobile phones became an attractive technology even for students who lack basic IT skills and my argument was that they could become useful educational tools, irrespective of the students' academic

background and competencies. As part of this project, I also created a small application, which was also tested by students. The application consisted of four educational activities: Addition/Subtraction, Multiplication, Solid Shapes (*See Figure 1*). The activities were carefully selected after discussions with basic skills mathematics teachers and evaluated by the students. Recent developments both in hardware and software enable collaboration and inquiry-based learning.

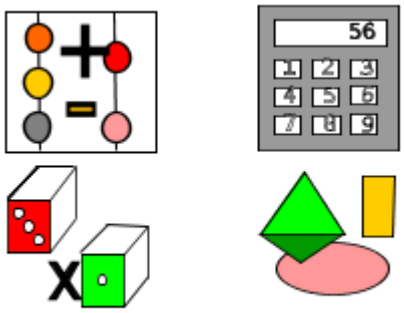

Figure 1: Main screen of the app I created as part of my Masters in Information Technology project and dissertation

In my dissertation about mobile technology in the teaching and learning of basic skills in mathematics, I also discussed in some depth the advantages of mobile devices over desktops and laptops. The benefits of working in an IT environment were enormous and I found it personally rewarding to have created an app which could be used in the classroom.

The motivation behind this study emerged after three years as an e-Learning Support teacher where I could observe how technologies were being used. I started as an e-Learning support teacher at the time when interactive whiteboards were being installed in schools and a virtual learning environment was launched. In actual fact, therefore, my support started when this huge investment was still in its infancy. At that time I was also aware that the Ministry of Education had in mind to roll-out tablets and I wanted to further contribute to this field and explore how

a tablet as hand-held device can be used in a meaningful way. When I used to deliver teacher training courses, as an e-learning support teacher, I was constantly asked for game-based learning, instant feedback assessment and hand-held devices which allow individualised learning and inquiry-based learning. Meanwhile, I have always heeded the importance of developing teachers' competences.

Whilst applying for my doctorate in education, a decision by my colleagues in the Ministry of Education was to downsize the e-Learning Centre and focus more on pedagogy, whereas the technical aspect had to be catered by the Information Management Unit. This led to a natural trajectory split and I was handpicked by the Chief Information Officer to serve as an ICT officer at the Information Management Unit for Schools. My own experience in delivering courses and providing training in ICT as an entrepreneurial tool, aimed at individuals who are employed with or own a microenterprise, helped me gain insight into the subject. Furthermore, my various experiences as a class teacher, e-Learning support teacher in the curriculum and in an information management unit environment, as well as an Education Officer (Digital Literacy), gave me the opportunity to apply theoretical and pedagogical knowledge, which contributed to the background I required for my doctorate studies.

The stance I have taken in this thesis has been, therefore, inspired by my experience in addition to a review of relevant literature. Before this study, as a Masters in IT graduate who developed a small educational app, an ICT teacher, and an e-learning support teacher, I held some assumptions. My assumptions were that tablets can transform learning through enabling access to information and collaborative learning opportunities, and through developing capable global citizens. At the same time, I was also aware that the inflexibility to relinquish teacher-centred classrooms would mean that the prospects for enabling learners in a 21st century world would

be a challenge. Whilst, therefore, it may be said that I went into the study with pre-set ideas, I did not let these shape the study. I started the project open to finding data that might challenge my assumptions and ensured that the processes of data collection and analysis were rigorous.

1.3 Defining literacy and digital literacy

Given developments in the media age, I share Roberts' view (1995, p.413) on what he called a "'pluralist' perspective on the problem of defining literacy." The empirical research of this thesis focused on English and Maltese language lessons and included a focus on reading and writing using a range of media, including digital technologies. Thus, traditional definitions of literacy that focus only on reading and writing on paper were inadequate. The definition of literacy in this thesis stems from Lanham (1995, p.198), who stated that literacy has extended its semantic reach from meaning "the ability to read and write" to "the ability to understand information". However I was also interested how students are active producers of multimedia/ multimodal texts and how they made use of the portable devices provided. Thus, I adoped a working definition of digital literacy that focused on reading, writing, multimodal meaning-making and the use and production of information across all media, including digital media, to suit the needs of the research. Lynch & Redpath (2014, p.150) claim that, "what counts as literacy is constantly being redefined and broadened, [but] classroom practices continue to position technology narrowly". Considering the fact that before early schooling, children have already been exposed to tablets as well as other digital media (Marsh et al., (2015), I believe that schools should acknowledge what Street (2016) referred to as the variety of everyday literacy practices. This reasoning enabled me not only to form my own defenition of literacy but also to reflect more on teachers' pedagogies. During my academic journey I came across the "Charter of the 21st century literacies" (Burnett and Merchant, 2018) and I found the nine principles to be incredibly relatable to my working definition of literacy, as it recognises the

way in which literacy is changing in the digital age, and the multiple lens that needs to be brought to bear on literacy in this context. I felt that the Charter could be of use in reflecting on how far Maltese teachers are, and could be, more inclusive by broadening their definition of literacy and consequently changing their pedagogical approaches accordingly.

1.4 Context of Study

My interest in the use of hand-held devices stems from the ubiquity of tablets in children's lives, as well as my intention to explore how mobile phones can be useful educational tools. Tablets, like mobile phones, can be described as mobile devices, as explained by Dias & Victor (2017) who cite the UNESCO (2013) report which states that, "mobile devices include any portable, connected technology, such as basic mobile phones, smartphones, e-readers, netbooks, tablets, iPads and computers". People are using mobile devices more intensively in all aspects of daily life and as Xiangming & Song (2018) observe, mobile devices have become a vital part of our lives and have changed the way we live and interact with each other. Tablets are ubiquitous in the lives of many young children and early literature in the field shows that mobile phones, together with television, are widely present in the homes of young children (Jones, Issroff, Scanlon, Clough, & Mcandrew, 2006). Hashemi, Azizinezhad, Najafi, & Nesari, (2011, p.2477) state that, "alongside formal education, everyday opportunities to access learning resources on mobile devices have multiplied." There is no doubt whatsoever, in fact, that all the new digital technologies are accessible to many of the present generation. This has implications for learning. Flewitt et al., (2015, p.305) argue quite convincingly that, "if innovative uses of new technologies continue to remain absent from the school curriculum and from pedagogy, then we risk failing to turn on a powerful switch that can light up this generation's learning". Student-centred pedagogical approaches are "facilitated by digital

tools" (Pegrum, Oakley, & Faulkner, 2013), and tablets may be a particularly useful tool in the classroom.

Tablets, however, are not a quick fix solution for outstanding educational problems (Kucirkova, 2014). Providing tablets is not an infallible formula for better educational achievement. The change should not only be in the type of educational resource or 'tool' used, but also in pedagogy and practice. This would imply a change in the teacher's approach, which would require a departure from the traditional approach to a more student-centred approach. Nevertheless, a study by Geer, White, Zeegers, Au, & Barnes, (2017) suggests that this move towards inquiry-based learning is not an automatic one and in the majority of cases, there has been little to no change in teachers' practices. Tablets, like any other tool, if not used appropriately would not reach their educational objective to positively contribute to literacy and other important educational skills. As Lankshear and Knobel (2003) suggest, the "old-wines-in-new-bottles" syndrome is prevalent in many teachers. Questionnaires conducted in a Maltese college (Camilleri & Camilleri, 2017) revealed that while teachers were aware that they have to adapt their approach, they also maintained that they were not confident to effectively use digital technologies. It is clear, therefore, that there is a need to undertake research in this area in the Maltese context in order to inform practice.

This study focused on literacy learning. The National Literacy Strategy in Malta promotes a balanced literacy (2014, p. 8), which it defines as a, "curricular methodology that integrates various modalities of literacy instruction". The new learning outcomes framework in Malta demand that students acquire a number of competences both in language learning, and also in digital literacies. Following these official guidelines and literature this thesis treats technologies as an integral component of teaching and learning of literacy. Even critics such as Neil Selwyn, argued that "digital technologies are now embedded so deeply into the

everyday of education that they should not remain only of interest to researchers who have a specific personal interest in the 'high tech'" (2014, p. 164). Digital literacy therefore stems from the definition of literacy and refers to meaning-making that involves digital technologies, although it is also acknowledged that children move fluidly across digital and non-digital domains in their meaning-making (Burnett and Merchant, 2018).

1.4.1 Tablet-mediated Teaching and Learning in Malta

The need for tablets was felt in Malta, mainly because of the contribution they could offer to literacy skills. Following a change in government on the 5th of March 2013, the Ministry of Education embarked on a long-term project to improve literacy. This was very evident in the majority of the official press releases, such as official priority lists in education sectors (Ministry for Education and Employment, 2014) and strategies such as the Framework for the Education Strategy for Malta 2014-2024: sustaining foundations, creating alternatives and increasing employability, all developed by the Ministry for Education and Employment. The pledge that all children, youths and adults should be equipped with the literacy skills required in life was the main lever for the National Digital Literacy Strategy (Ministry for Education and Employment, 2014 p. 6). These proposals were written by eight expert consultative working groups, one of which was focused on Digital Literacy.

The National Digital Literacy Strategy also embraces the 'One Tablet Per Child' project (Ministry of Education and Employment, 2014, p. 57), since it is the Ministry of Education's target that the project be first and foremost an educational project and not a technological one (Ministry for Education and Employment, 2014). Evidently, the emphasis is that technology is a useful tool, but not the end goal of education. Digital Literacy is encouraged by the National

Curriculum Framework in the Maltese context, which recommends, "a shift to constructivist education philosophies" (Ministry of Education and Employment, 2012 p. 37). Digital Literacy was one of the priority areas in the National literacy Strategy (Ministry for Education and Employment, 2014 p.10) with the aim to, "promote the use of new technologies in the teaching and learning of literacy".

During the launch of the tablet pilot project, the Minister of Education and Employment Evarist Bartolo reaffirmed that this is an educational project and not a technological one. (Ministry for Education and Employment, 2014). Such a nationwide strategy is also a continued drive to apply technology in schools, following the earlier introduction of desktops in schools, provision of laptops for every teacher, introduction of interactive whiteboards in every classroom, and access to a virtual learning environment for every student and educator.

1.4.2 One-Tablet-Per child Project in Malta report

At the moment of completing this thesis the National Audit Office (NAO) of Malta has published an Information Technology Audit: *The Effective Use of Tablets in State, Church and Independent Primary School* (2019). This was published after 3 years of the One-Tablet per child initative. Due to the potential contribution of my thesis to the national agenda and as a guide for future reference and implementation of tablets or similar hand-held devices in Maltese classrooms, I felt it was crucial that I include a section explaining the outcomes of this report.

Over 70% of the replies from teachers and parents interviewed in this research carried out by the Auditor General's Office stated that the tablets project 'One tablet per child' has helped students in their educational career (NAO, p.10). Sixty-eight percent of the replies by educators

indicate that tablets are helping them in transmitting knowledge. With particular reference to the pedagogical affordances of tablets, the feedback shows that this learning tool provided educators with a more engaging and innovative way of delivering a lesson and offered a good tool for students' continuous assessment (NAO, p.10). This was of particular interest, since the country is replacing its half-yearly examination with assessment for learning.

Half of the replies from parents and teachers indicated that students are using the tablets for home use, mainly for homework, reading or studying (NAO, p.47). Regarding the quality of the digital content for the respective subjects, this study shows that the mathematics and English Language apps were more appreciated by parents and teachers, more than the Maltese Language app, science, social studies and religion (NAO, p.48). The NAO was also informed of open-ended apps that helped students think creatively, such as the Mind maps app, which was useful to use to brainstorm any topic and build thoughts on a story plot or theme. There were also apps intended to encourage reading such as Oxford Owl, Study ladder, LiteracyPro (NAO, p.27).

On the other hand, the National Audit Office report also highlights some challenges. Nineteen percent of participating parents indicated that students are using the tablets at school on a daily basis and 20% of participating teachers who responded, reported using the tablet only when an activity is planned. These results fuel concerns that the "any-time-anywhere" affordance of tablets is not being utlisied.. Despite the fact that students are meant to take the device home every day, a quarter of replies from parents and teachers indicated that students are not using the tablets for home use (NAO, p.47). Eighty four percent of parents indicated that tablets were not being used on family outings and 61.5% of the replies from educators indicated that tablets were not being used on educational outings organised by the school (NAO, p.47). A

number of technical challenges were encountered which may have impacted on these choices, such as unreliable wi-fi, battery not charging or holding charge and the slow performance of devices (NAO, p.48). Further, a significant 82.9% of educators responded that children were not charging their tablets at home (NAO, p.44).

Some participants also reported lack of support with 35.1%, indicating that the support of support teachers is only available when requested, 13.7% of respondents specified that this service is available once a week, and another 10.7% of participants stipulated that this service is only available once every fortnight. The role of support teachers in assisting class teachers in the transition to new ways of teaching through tablets is so important that the Ministry for Education and Employment (MEDE), "may have influenced the result" (NAO, p.53).

Another interesting result with regard to tablet usability was about the use of apps. Apps for Maltese, Science and Social Studies were poorly rated (NAO, p.48), but MEDE explained that the majority of apps available on tablets were not subject-based. The tablets contained apps which enabled students to create digital content such as WorkSpace, Author Premium, PicSay, SimpleMind, Animator, StoryVisualizer and Comic Strip It, and apps which faciliated self-assessment such as Kahoot, Quizizz and Quizlet and also coding apps such as J2Code, Scratch Junior and WeDo 2.0 (NAO, p.53).

This study offers an important backdrop for my research. It suggests that tablets have had a positive impact on Maltese education, but that there are still barriers to be faced. However, what the report does not do is to provide detailed reflections on the use of tablets in classrooms which can develop an understanding of their affordances and challenges. This is the aim of my study.

1.5 Research questions

The aim of this thesis was to identify the benefits and challenges of using tablets to foster digital literacies in the Maltese classroom. Whilst this study acknowledges the ubiquity of mobile devices (Papadakis & Kalogiannakis, 2017), the assumption is that pedagogy should drive technology. It aims to serve as a guide in terms of how the teaching profession can tap into the potential that tablets have for improving education. This involves a consideration of the affordances of tablets. My definition of affordances draws upon Gaver (1991, p. 5) who argues that affordances should, "not focus on technologies or users alone, but on the fundamental interactions between the two". Hutchby reaffirms that:

> …affordances are functional and relational aspects which frame, while not determining, the possibilities for agentic action in relation to an object. In this way, technologies can be understood as artefacts which may be both shaped by and shaping of the practices humans use in interaction with, around and through them.
>
> Hutchby (2001, p.444)

With regard to the overall use of technology in the classroom, Conole and Dyke (2004) developed a taxonomy of ICT affordances which includes: accessibility, speed, diversity, reflection, multi-modality and non-linearity, risk, fragility and uncertainty, immediacy, monopolisation, and surveillance. These ICT affordances were pivotal throughout my studies, since they enabled me to delve deeper into the usability of tablets as technologies and the interaction of children with tablets. In relation to the study of tablets in the classroom, Lawrence (2018) identified their portability, their touchscreens, the capacity for multiple-person viewing and their small size as their affordances in promoting preschool children's social interactions during digital play. Therefore, my first research question was the following:

a. How far are tablets creating new affordances for literacy learning in the Maltese context?

The benefits of tablets as mobile devices such as portability, interaction, collaboration and just-in-time learning recur across literature (e.g. Burnett, Merchant, Simpson, & Walsh, 2017; Flewitt, Messer, & Kucirkova, 2014; Hashemi et al., 2011). However, the key to educational success, especially in terms of tablet-mediated teaching and learning, are the teachers themselves (Melhuish & Falloon, 2010), for, as Dig Comp rightly asserts, "the ubiquity of digital devices and applications, in particular, requires educators to develop their digital competence" (Redecker & Punie, 2017). Hence my interest in the various facets of tablet usage included examining how far teachers want to embrace tablets in order to reach their educational outcomes while acknowledging the difficulties they may face in this process. Therefore, my second research question was the following:

b. What are the challenges of using tablets in the classroom for literacy learning?

This research question sought to identify factors that hinder effective implementation of tablet-mediated teaching and learning. Anecdotal evidence suggests technical problems such as unreliable network connection and lack of tablets, lack of pedagogical support, and internet safety are issues which need to be addressed prior to any implementation of a tablet programme.

The project also aimed to have an impact on practice. In Malta, the Ministry of Education was resolved to implement the one-tablet-per-child programme in primary schools, which materialised during the writing of this thesis, and is committed to continue with a similar programme in secondary schools. This thesis, therefore, aims to shed light on these issues and to propose ways how they can be tackled. While reflecting on the benefits and challenges of

tablet-mediated teaching and learning, and the recognition that no technological investment in our classrooms can be successful without the pedagogical preparation of educators, I discovered how Burnett, Davies, Merchant, & Rowsell (2014) developed a set of principles resulting from their research in new media. The Charter for 21st Century literacies was first published as a series of foundational principles in the last chapter of the book: *New Literacies Around the Globe: Policy and Pedagogy* (Burnett et al., (2014). This Charter outlines nine recommendations for developing literacy curriculum and pedagogy in the digital age. Therefore, a third research question, albeit of a supplementary nature, was developed:

c. **How far are the principles of the Charter for 21st Literacies (Burnett and Merchant, 2018) evident in teachers' practices with tablets in two Maltese classrooms?**

This question aimed to consider how far the principles outlined in the Charter could be identified in the classrooms under observation in order to identify those principles that might need further consideration in the Maltese context.

1.6 Structure of Chapters

This thesis consists of five chapters. In this first chapter, I have introduced the subject of the research. The underlying motivation for the study was presented, including a review of my professional experience in this area. Chapter Two provides a review of literature that has examined the benefits and challenges of tablets in the classroom. The literature review enabled me to identify the main themes related to tablet usability, as featured in recent research. This chapter also explores how the principles of the Charter of the 21st Century literacies (Burnett et al., 2018) can be beneficial to teachers' pedagogies in literacy learning.

Chapter Three describes the methodology used for the research and the way the methods implemented to collect, analyse and interpret the data evolved. In this chapter I also discuss the ethical considerations in relation to this research study, as well as the approach towards analysis.

In Chapter Four, I present and analyse the data collated throughout the 5-months observations, whilst Chapter Five offers conclusions on this study and also provides recommendations for future research, policy and practice.

1.7 Chapter Summary

This study did not attempt to conduct a feasibility study with regard to whether tablets should be introduced in the classroom, since the implementation of the one-tablet-per-child project had already come into effect, and a review of its general efficacy had been undertaken. Instead, the thesis aimed to provide a detailed review of the affordances and challenges of using tablets for literacy learning and teaching in two Maltese primary classrooms. In this chapter, I have provided the background to the study and offered a rationale for this focus. In the next chapter, I discuss literature which informs an analysis of the benefits and challenges related to tablet use in the classroom.

Chapter 2:
Literature Review

2.1 Introduction

This chapter reviews literature related to the role of tablets in the development of children's literacy skills. Among several technologies which can be used in digital literacy practices and in accessing e-reading material for children, the use of tablets is predominant (Miller & Warschauer, 2013). This is the case in children's early years at home. In a study aimed to explore play and creativity in pre-schooler's use of apps (Marsh, et al., 2015), 41.3% of UK parents said their children had access to an iPad, and some of them used it more than 30 minutes per day. The popularity of tablets among pre-schoolers was also evident in case studies of fourteen families published in 2012 by Plowman, Stevenson, Stephen, & Mcpake, 2012. These findings correspond to earlier research which shows that children are exposed to tablets from a very young age. O'Mara and Laidlaw (2011 p. 152), for example, after observing children for two weeks, individually and in family groups, found out that tablets were deeply incorporated into the lives of the children they studied "in interesting and complex ways". Considering that so much learning is taking place even in 'out-of-school' contexts, and that students are finding tablets appealing, it makes sense to exploit the full potential of tablets. Fantozzi, Johnson, & Scherfen (2018, p.681) state that, "our children's lives (as well as the lives of many children around the world) are filled with digital stories outside the classroom. Despite the fact that tablets are becoming more pervasive in our children's out-of-school lives, however, schools are not maintaining the pace in relation to embracing tablets as tools to support learning (Fantozzi, Johnson, & Scherfen, 2018; Blackwell, Lauricella, & Wartella, 2014) and they are rarely used in preschool settings (Lawrence, 2018). When used in schools,

tablets have been found to be “motivating and engaging for students” (Pegrum et al., 2013, p.69).

Kucirkova (2014) identified several advantages of tablets, among which were their potential to foster multimodal communication and their portability. She argues that, if used appropriately, these advantages provide “unprecedented opportunities for children to create their own contents and participate in rich and dynamic learning contexts” (p.715). Using tablets is a different experience not only from traditional books but also from traditional technologies, including television. Children can interact in different ways with digital media, which offers the possibility for autonomous, self-directed learning. On the other hand, tablets, like all educational technologies, offer new challenges to educators. Some authors (Nguyen, Barton, & Nguyen, 2015) argue that there are inconclusive results as to whether tablets improve learning. Another concern amongst educators is that tablets, like other mobile devices, are distracting (Wakefield & Smith, 2012). Other authors (e.g. House, 2012; Cordes and Miller, 2000) even argue that tablets should not be used by very young children, since they might impact negatively on their development. Therefore, the themes explored in the reviewed literature were not only from proponents of the use of tablets, but also from those critical of certain tropes in relation to the use of technologies in education, such as Selwyn (2014), in order to investigate these tensions further.

2.2 The educational affordances of tablets

This section identifies several affordances of tablets for teaching and learning. The affordances explored in this literature review are not limited to tablets’ technological features, but the focus

is on how tablets can be integrated into teaching and learning to enhance children's learning. Although the focus of this study is on tablet usability, the literature intersects in many ways with other hand-held devices in the m-learning sphere. It should also be noted that the choice of hybrids (2-in-1s) nowadays is much broader than in the past years, with the advent of touch screen laptops and netbooks.

Some of the advantages of tablets, such as the possibility to include a number of e-books and reduce the schoolbag size, are not analysed in this literature review, which focuses mainly on pedagogy. While carrying heavy school bags is a concern for some students, the literature identifies more far-reaching benefits, which are explored below.

2.2.1 Tablets stimulate children's motivation

Santori & Smith, (2018, p.25) state that most of the research about the benefits of tablets is concerned with how they motivate and inspire children's learning in the classroom. Dunn & Sweeney (2018, p. 860) suggest that, "The use of tablet devices is also reported to enhance motivation and independence, which is often lacking in the teaching of writing". Motivation in learning has been explored quite thoroughly in several educational topics but with regards to technologies in education, Ciampa (2012, p.2) argues that, "motivation to read is both the essential element for actively engaging young children in the reading process and a strong predictor of later reading skills". There is a growing body of research that discusses how tablet devices affordances (including portability and the use of multimedia, which are going to be discussed in this chapter) contribute to more motivation in students. Kucirkova & Sakr, (2015) mention how multimedia stories can enhance children's creativity. Geer et al., (2017, p.1)

describe tablets as emergent technologies that can, "bring about a transformation in education where students are engaged in rich authentic experiences that will enhance their motivation and learning." The researchers observed several activities using tablets such as browsing, using educational apps, taking and editing photos and videos, and reading books and watching videos. They observed a shift from enhancement to transformation using the Substitution, Augmentation, Modification and Redefinition (SAMR) framework of Puentedura (2009). The SAMR model is a four-level approach tool which describes and categorizes teachers's uses of classroom technology (Hamilton, Rosenberg, & Akcaoglu, 2016)

Another reason which contributes to motivation in learning is because tablets are, "easy for young children to use" (Lawrence 2018, p.210). Lynch & Redpath (2014, p.156) state that:

> …young students very quickly developed competence in the use of the iPad and iPod Touch devices, that they demonstrate a high level of motivation towards using these devices, and that, unlike with other forms of digital technology available in the classroom (e.g. desktop and laptop computers), these devices pose very few (if any) technical issues for this young age group. (p.156)

2.2.2 Tablets as portable devices

As Burnett (2017, p.20) proposed, tablets enable, "the portability needed for flexible use across a range of teaching and learning activities". The "physical size and shape" (2017 p.21) of tablets offer great opportunities both for reading and also for other activities, including quick access to reference material, not only in the classroom but also during field work, workshops and outdoor learning. Tablets may be crucial to facilitate these activities in out-of-classroom activities, which in school settings are known as fieldwork (France et al., 2015). Despite concerns that students are getting too much screen time (Cytowic, 2015) tablets can facilitate

several innovative approaches to teaching and learning, including usage in several cross-curricular out-of-school activities and face-to-face social interactions.

Students may benefit from the multitude of functionalities of tablets. In my Masters in Information Technology dissertation (Seguna, 2010), I analysed how e-Learning and mobile learning are a natural extension of this functionality (Brown, 2003). I have drawn on the work of Boyinbode & Akinyede, (2008), who described mobile learning as a sub-set of e-learning by claiming that where mobile computing intersects with e-learning, it can therefore be described as a subset of e-learning. The semantic focus, when using the terms 'mobile' or 'handheld device' is on the move from traditional e-learning to a more flexible environment (Lominé & Buckhingham, 2009).

Tablets offer a more portable learning experience than other mobile devices such as laptops, "which, although they can be transported to different locations, [they] lack the convenience and flexibility of smaller handheld devices" (Pegrum et al., 2013, p.66.). Although the keyboard functionality makes typing easier than the onscreen keyboard, peripherals are more inconvenient to carry and use in fieldwork and outdoor activities. Kucirkova (2014, p.1) argues that, "iPads are portable and light-weight (unlike netbooks and laptops)" and that they eliminate the need for separate input devices requiring certain levels of dexterity (such as mouse and keyboard).

An evident advantage of tablets is the possibility of accessing hundreds of e-books on a single device as opposed to traditional print. There are environmental concerns about traditional print and the carbon footprint of paper (Panyasai, Hansuebsai, & Shimizu, 2013). However, the pedagogical advantages are more relevant to this dissertation, including the tablet's flexibility

and easier access to a large number of e-books, reference tools such as the dictionary and to other learning apps. Maynard (2010), in her research about e-reading amongst young children, sheds light on the potential advantages of e-books compared to traditional print and reports that some children find digital readers lighter and easier to hold, easier to read when lying down, and also that the pages do not turn by accident as often as they do with printed books. Wardley & Mang (2015, np) remark that students in their data set, "did consider prosaic aspects of the iPad such as increased mobility and reduced need to carry heavy textbooks to class".

The ubiquity of tablets extends learning beyond the classroom walls and even beyond the school building. It enriches teaching and learning anytime and anywhere (Xiangming & Song, 2018;Wong, 2012), or what has been termed as seamless learning, through the use of simple interfaces. Anytime-and-anywhere learning is defined by Wakefield & Smith (2012) as, "the ability to find, evaluate, and use information nearly instantaneously at any time and place." Christensen & Knezek (2017, p.381) state that, "The portability of these mobile devices allows students to connect to content within and beyond the classroom walls and the time periods when students are in school." The ultimate outcome, therefore, is that children can avail themselves of learning tools that are meant to transform learning rather than just sophisticated toys.

The portability of tablets may also be of value to children with special educational needs. Assistive technologies have always been widely used in education (Hockly, 2018), and both hardware, such as adaptive switches and touch screens, and software have long been perceived as an important requirement for special education needs students. Hashemia, Azizinezhad, Najafia, & Nesari (2011, p.2480) argue that the tablets' portability, size, weight and shape

make them potentially beneficial tools in special educational needs and enable students to, "organize their lives and achieve some independence."

2.2.3 Touch screen facility

Tablets have the potential to offer a richer user experience than television and other technologies because students may touch rather than listen or watch, as in the case of television. Rather than having static pictures and texts, tablets offer the possibility to highlight texts, watch videos, take notes, swipe through pictures and pages and search for content. This interaction with the environment through touch was the basis of Minogue & Jones (2006)'s research, which focused on the role of touch in cognition and learning. Mark-making has long been acknowledged as an important foundation for the development of writing skills (Coates & Coates, 2006). The study of human interaction with the external environment is referred to as 'haptics' (Minogue, et al. p. 318). Haptics have evolved over the years from hyperlinks, scrolling, and vibrations in game consoles controllers. Distinct effects and enhanced realism improved the look and feel factor. Children are used to having something occurring when touching, scrolling or swiping using interactive screens. Besides dynamic effect capabilities, interactive screens also offer the possibility to acquire more information, since rather than having static pictures, students may also experience videos and other information. The touch-screen interface allows students to engage more interactively with content. The learning experience, therefore, is not only being enhanced but also becoming transformative and addressing students' needs. Laindlaw and O'Mara (2015, p.59) maintain that "the affordances of touch screen devices offer young and preliterate children the possibility to independently design, create and produce their own texts in ways that are more easily facilitated than with tools such as paper and pencil".

Mangen (2008) researched the idea of haptic modality within hypertext fiction reading and tried to find out how digital technology could affect the way we read. E-books may have several features such as zooming and highlighting but some people, particularly bookworms who love the 'smell' of books, may argue that traditional print books makes reading physically pleasurable. The effect of holding and flipping through a traditional book is very different from that of an e-book and as Buckleitner (n.d.), editor of 'Children's Technology Review', has noted, "iPads will never replace the smell of freshly peeled crayons." Picton (2014) compared a 2011 study where regular computers were involved (Ackerman & Goldsmith, 2011) to a more recent 2013 study (Margolin, Driscoll, & Toland, 2013) and concluded that in the second study, reading from paper-based books was more of a personal preference for the next generation of readers who are also choosing e-books.

Children who are used to tablets may find it easier and more intuitive to swipe on the screen, than to navigate with a mouse. Although less effective than using paints or other media in some cases, it can be a convenient solution and may be an added value to some lessons in class. On the other hand, Picton (2014, p.15) states that many eBooks are able to, "recreate many of the best features of printed books", in some cases simulating turning pages with your finger to provide what she describes as, "paper-like reading experience". As Mangen (p.407) posits it, "The tactility of a mouse click, of touch screen page turning or of a click with the e-book page turner bar is very different from that of flicking through the print pages of a book". To overcome shortcomings, many e-book readers and apps nowadays use skeuomorphic visual design and simulate flipping through the pages of an actual book. In addition, e-book readers also have other features like highlighting, note annotation, and bookmarking.

Rowsell et al., (2013) did extensive research on how iPads can be used for reading and the physical and cognitive processes taking place during the reading activity. They found that during one's activity using tablets, there is an amount of hand-to-eye coordination and finger movements taking place. Clark & Luckin (2013, p.12) sum up the benefit of this functionality of tablets in educational settings:

> The finger-driven interface motivates and engages students, keeping them interested in content for longer periods of time, and allows students to interact with the device at the same time and with the same object, enhancing and stimulating simultaneous opportunities for face-to-face social interaction in ways that desktop, laptop and even netbook computing with their mouse-hyphen-driven screen, 'individual' peripherals, fixed location, weight and overall design do not. (p.12)

While researching haptics and the tablet's tactile qualities, I became familiar with the concept of 'intra-action', introduced by Barad (2007). In interactions, independent entities are viewed as affecting each other without necessarily depending on each other. Intra-action entails more than this, for it involves the mutual constitution of interdependent agencies. For example, when interacting with a soft toy, the "agent is not the child alone, rather both the child/children and the thing(s) in question" (Rautio, p.462). Researching "intra-action" between humans and tablets, therefore, is essential in examining the use of tablets in the classroom.

2.2.4 Tablets as tools for multi-modal text production and analysis

An added value to education when tablets are used is the potential to create and respond to multimodal texts. In addition to their portability and the facilities of the touch screen, another main educational possibility is to, "record, transfer or provide information to the user, in any location[…] allowing the transfer of information over wireless and Bluetooth connections,

capturing and storing multimedia data along with variety of analytical applications" (France et al., 2015). By using tablets, children can record their own voices, watch videos, take photos and integrate the data they gather with their own stories. In other words, they can switch from one app to the other, copying and pasting while making use of tablet features which are beneficial to learning, including, "audio and video recording, instant access to the Internet, texting, uploading and sharing files" (Christensen & Knezek, 2017, p.381). A text can be thoroughly transformed through digital media in terms of its appearance. Sometimes, visual arrangements of text, images and symbols, rather than linear written text, is the preferred choice of readers. This multi-directionality of reading paths is the subject of Simpson et al. (2013) report on data they collected as part of a Social Sciences and Humanities Research Council (SSHRC) funded project, involving researchers from Canada, the United States and Australia. They asserted that students follow reading paths which, "are not only non-linear and multimodal but multidirectional, where the latter term is taken to refer to interaction across interrelated textual dimensions and platforms" (Simpson et al., 2013, p.123). Besides these distinctive features of digital texts, Moore (2017, p.22) also points out that "using more advanced digital tools and carefully selected programs, children can continue to actively create and communicate their interests, thinking, and understandings of the world around them." The ubiquity of tablets seems to raise more interest in new literacies and content-creation. Davies (2012, p.20), for instance, distinguishes between new literacy and new literacies, where the latter refers to the multiple forms of literacies, which may include social networks, blogs, instant messages, podcasting, sharing images, videos and music, digital storytelling, games etc. Santori & Smith (2018, p.29) argue that tablets, "can empower students to develop multiliteracies in productive and innovative ways while effectively addressing the needs of 21st-century students."

One of the competence areas in the Digital Competence Framework for Citizens (Vuorikari, Punie, Carretero, & Brande, 2016, p.9) is Digital Content Creation and the ability "to create and edit digital content in different formats, to express oneself through digital means; modify, refine, improve and integrate information and content into an existing body of knowledge to create new, original and relevant content and knowledge". By making use of technologies, children are becoming producers of different kinds of works (Lynch & Redpath, 2012; Clark, 2011) rather than remaining passive learners. Using a simple tactile interface, finger-based operating features, cameras, colours, sounds and augmented reality, tablets offer wonderful possibilities, which can be explored in education. In this sense, tablets facilitate transformative learning. These type of activities should allow the students to, "interact with others in writing and reading situations, explore print on their own, and experiment with different forms, inventing their own literacies" (Neuman & Roskos, 2010, p.10). These are all examples of how the use of tablets can be integrated in education in meaningful ways. O'Mara & Laidlaw (2011, p. 152) describe how children involved in their study whilst using tablets can be "'creators', 'designers' and 'experts', rather than mere passive responders". As Kucirkova et al. (2013 p. 116) argues in a study using an iPad application:

> iPads offer the possibility for creating and sharing personalised stories in a multimedia device that offers the use of audio recordings, photographs, film and writing and the subsequent production and sharing of multimodal stories using sound, images and typed text. (p.116)

Neuman & Roskos (2010) recommend that classroom teaching should provide a rich and dynamic context for both academic learning and real-world opportunities where children can experience problem-solving situations and, using their multi-literacy capabilities, can strategically adapt their purposes for literacy in different situations. I believe that tablets can be great tools to facilitate Neuman & Roskos (2010)'s recommendations, since they can serve

both as e-readers and also as ‘creation’ tools where children can create their own stories. Children may take photos using the tablet’s inbuilt camera, capture images, search for content online and use an e-book creator app to create their own book. The use of the camera together with open-ended apps also facilitates a flipped classroom model where, “the direct instruction is offloaded to the individual space, and the class time is used for something else” (Bergmann & Sams, 2016, p. 5). This model, which shifts from passive learning to active learning, creates several possibilities which were previously difficult to achieve without the use of technology. When a classroom is flipped, the most difficult tasks can be done in class in the presence of teachers, whereas the ‘instruction’ part can be done at home by means of videos so that learning can take place through a virtual learning environment. Bergmann & Sams (2016) mention apps that can support this kind of learning, such as apps that facilitate video recordings (p.17) and QR code scanning (p.20). Furthermore, interest in augmented reality is growing (Billinghurst & Duenser, 2012) and is steadily sweeping into our classrooms. Augmented reality can bring pictures to life, and this is evidently facilitated by using tablets’ cameras. Therefore, whilst desk-top computers and laptops can also facilitate multimodal meaning-making, tablets foster this kind of creative activity because of the camera feature, as well as the wide range of creative apps produced for tablets.

2.2.5 Tablets facilitate personalised learning

Grant and Basye (2014, p.3) argue that, “students in the same grade have different knowledge base levels and learn at different rates. They are more likely to succeed academically, emotionally, and behaviourally when they are supported as individuals”. Personalised learning is based on the premise that no two individuals learn the same way, nor do they bring the same prior knowledge to a learning experience. The easy access of tablets to young children allows them to interact and feel in control over their device (Price, Jewitt, & Crescenzi, 2015) and

fosters a sense of belonging to the children i.e. children feel the device belongs to them. Clark & Luckin (2013, p.11) state that, "for many students, having not only personalised access to this state-of-the-art technology but also individual ownership of the device, is highly motivational".

In their research among four Australian regional low SES schools, Prain et al. (2013) found that a personalised learning approach has the potential to address improvement in students' academic attainment and well-being if an effective curriculum is established that offers and requires support, both from and for teachers and also from and for students. Personalised learning, "depends on the expertise of teachers to support students' meaningful goal-setting, accompanied by the provision of an engaging curriculum that offers timely strategies and learning experiences to address student goals" (Prain, et al., 2013 p. 672). Learning spaces have to be designed to allow for personalised, collaborative learning and to cater for different learning needs. Technologies, particularly tablets, are crucial in one-to-one teaching and learning. Never was individualised learning so facilitated as it is with tablets, which enable teachers to shift from a one-for-all approach to one-to-one teaching. Grant & Basye (2014, p.3) maintain that "the customisation one-to-one (often shortened to 1:1) computing approach transforms learning environments, turning them into dynamic communities of connected learners taking advantage of digital tools."

The ease to create educational content using tablets does not only provide opportunities for students, but also for educators and parents because they allow them to create education resources adapted for their children. One of the problems with outsourced educational content is that it is not always relevant to the students. There are times when the resources are not related to the local curricula. Besides, there are also details that are not always relevant to all

cultures. In Malta, pictures of a bus showing the London bus, rather than a local bus, for example, are quite common. Another example concerns currency use, where in some off-the-shelf content, pounds or dollars are used rather than euros. Another difficulty in Malta is that teachers find very little online educational content or off-the-shelf content in Maltese. Kucirkova et al., (2013 p. 116) describe personalised stories as, "intrinsically relevant to the child's socio-cultural experience and aligned with the child's personal experience", as opposed to most stories found in commercially-produced books. A number of easy-to use apps on tablets can help create content.

2.2.6 Tablets facilitate collaboration

Throughout the last twenty years, we have witnessed two great technological changes in the devices we use. The Internet allows for a more collaborative environment, particularly with the advent of Web 2.0, which is more programmable, with increased functionalities and artificial intelligence particularly characterised by the use of Extensible Markup Language (XML). Another significant change that could lead to further collaboration was the development of devices that were smaller and more portable than previous digital tools (Murphy, Farley, Lane, Hafeez-Baig, & Carter, 2014). Tablets, which are the focus of this study, provide new opportunities for collaboration, not only because of their size but also due to their camera and microphone functionalities as well as a number of collaboration apps. This new environment is really transforming the way students connect and share ideas. Even if users are not connected to the internet and social sites for collaborative learning are not used, students can work together on projects, search and create content and help each other in problem-solving activities. Collaboration is not limited to online contexts but is also possible in face-to-face interactions involving the use of tablets as well. Mercier & Higgins (2013)

analysed a specifically designed application, on four networked, multi-touch student tables controlled by a tablet which could also project content onto the classroom's interactive whiteboard. Their study is interesting because they outlined a number of advantages including, "opportunities for students to be innovative as well as efficient" (p.22) and "opportunities for elaboration of ideas within the group" (p.18).

The advantages of collaborative learning using social media apps on tablets have been evidenced by several researchers. Schroeder, Minocha and Schneider (2010) analysed 20 social media initiatives in UK-based higher and further education institutions in order to identify the diverse experiences and concerns of students and educators. They proposed a number of recommendations for the use of social media as a teaching and learning tool. They highlight the pedagogical benefits of collaborative learning where students, "not only present their own insights but also consolidate and refine each other's contributions" (Schroeder et al., 2010, p.160). Similar conclusions were derived by Ktoridou, Eteokleous, & Zahariadou, 2012) who state that two benefits of collaboration are, "the removal of racial boundaries that enables children to understand each other's differences and attributes" (p.135) and sharing of, "resources and ideas (texts, images, music, videos, etc.) with people who have the same interests" (p.135).

Collaboration introduces students to new people, cultures, places and experiences. Grant & Basye (2014, p.2) state that:

> Students thrive on dynamic learning experiences that are collaborative, relevant and engaging. As cloud-based learning solutions and mobile education apps continue to become more popular, schools need to find innovative ways of integrating these technologies into teaching, learning and assessment. (p.2)

Collaboration is not a new concept that was merely developed with the advent of tablets or of technologies in general. People have long been collaborating with each other in order to deal with situations that require teamwork, especially when it comes to maintaining a healthy working environment and nurturing a good family and social life. Daily meetings in the local village squares and social clubs are still existent, but even in these contexts, the dynamics of communal interaction are taking a different shape. The village squares and social clubs have extended their discussions and their propaganda to social media environments by means of online forums and video sharing. Similarly, e-twinning projects are continuing and extending class collaboration and fieldwork activities. Clark and Luckin (2013) argue that whilst several technologies allow for video conferencing features, the portability, speed and ease of tablet usage make it an excellent choice for these kinds of shared learning.

2.2.7 Tablet usage to fight digital and social inequalities

The rationale of my Masters in IT project and dissertation (Seguna, 2009) was that mobile phones have become such a common technology that they are very accessible even to economically disadvantaged students. I argued that mobile phones could lift some students over economic barriers, because those 'computers' inside their pocket are actually cheaper than desktop computers which some parents cannot afford. At that time, I used to teach in a secondary school in an inner harbour region in Malta. Social differences do exist across the island, and underachievement is statistically higher in some parts of the island, like the inner harbour region, which is mostly made up of working-class families. These areas top the list of failing students and truancy (Cefai, Cooper, & Camilleri, 2009). The inner harbour region (particularly Cottonera, Valletta, Floriana, Marsa, Paola and Ħamrun) became a popular location amongst the working class due to the Malta Dry Docks, which provided employment for thousands of workers. Further to this, due to the hostilities of the Second World War,

several people coming from the inner harbour region fled their homes and cities and the area became characterised by cheap housing and people on low incomes from different parts of the island. Cheap housing also became attractive to immigrants from Africa and the Southern Mediterranean, (Caruana, 1999).

Cutajar (2006) conducted a research study intended to explore the possibilities of teenage mothers to work and study. She found out that the majority (64%) of single parents in Malta live in the Harbour Region, 32.8% in the Inner Harbour Region and 31.1%, in the Outer Harbour region (Cutajar, 2006, p.216). Single-parent mothers tend to dedicate their lives as parents depending on social security; something that led the present government to motivate single parents to substantially improve their income by entering into employment and at the same time become less of a burden on the economy (Ministry for Finance, 2014). Being economically disadvantaged, both working-class men and women find it difficult to finance their own education and leaving school at an early stage enables them to earn a living. Cutajar (2006, p.220) observed that, "lack of educational credentials and labour market skills can deprive young, unmarried mothers from finding well-remunerated jobs that enable them to maintain themselves and their children". This local social background must be taken into account when dealing with the subject at hand, since the cost of tablets may add to a family's financial problems , as shown in the work of Welsh, et al. (2015), who describe how children in their findings found the cost of iPads very expensive. The 'One-Tablet-per-Child' initiative in Malta removed this financial barrier and it is one way to partially solve the financial difficulties, though it is not always possible.

However, all technologies are now becoming more available in many countries. Plowman et al. (2012, p.33) found out that, "by the time they started school, nearly all of the children in

[their] case studies had encountered a range of technologies, such as mobile phones, television, games consoles, DVD and MP3 players, as well as desktop and notebook computers". Today's children are being raised as 'digital natives'. Plowman's research was amongst pre-schoolers in 2012 in Scotland and since then, mobile technologies have become more affluent amongst young children. Denying students this basic entitlement of using tablets on social and financial grounds is an exclusive position that goes against social mobility.

2.3 Challenges of using tablets

As the previous sections indicate, literature evinces that since 2010, when tablets were still in their infancy, there has been an increased acknowledgement of the effectiveness of tablets as tools for learning. As portable devices, they enable students to access interactive and dynamic content anytime, anywhere. The ease of interaction via the touch screen enables young children to access the devices with fewer difficulties compared to desktop computers which they previously had in class. Literature also reveals, however, that tablet usage in the classroom does not come without its drawbacks. This review provides a balanced discussion of both the pros and cons of the integration of tablet devices in the classroom. Proper infrastructure and teacher training in technology-mediated teaching and learning are among the challenges identified by various authors which need to be addressed. In this section, therefore, I will be discussing the challenges of using tablets in the classroom.

Despite the tangible and educational benefits of tablets, as outlined above, there are various strategic considerations to be taken should a tablet programme be implemented. Grant & Basye (2014, p.128) identified the following features as problematic: "Multitasking between applications; the capability of using common powerful applications, such as Microsoft Office

and Adobe Photoshop; Input through a keyboard, a tough interface, or a stylus". These aspects cannot be dismissed because small devices have limitations when compared to standard desktop computers or server computers. One of the obvious differences from using desktop computers is that the screen is smaller. Other limitations are related to memory, alternative input methods, and slower processors. As I.T. users, most of us are used to switching from one application to the other and even working on two-word documents at the same time. This is very different on tablets, although the multi-window button on androids is a promising start. Some applications are limited and adapted on tablets and students may have to switch from one device to another in order to use them. Educators also need to ensure some sort of seamless transfer from one device to another. Grant & Basye (2014, p.129) advise that: "Before adding hundreds or even thousands of new devices, it's important to investigate how these devices will work with existing hardware, such as desktop computers, printers, and interactive whiteboards."

Like other technologies, tablet usability in classrooms should be beyond the excitement they may incur. Selwyn (2014, p.159) gives us a lot of food for thought with regard to the use of technologies in education, which I am extending to tablets. He asks, "Where is the evidence for success? What are the outcomes of this investment? What are the unintended consequences?"' is this where the quote ends? I consider these questions as fundamental to understanding tablets' affordances in education.

2.3.1 Integration of tablets as a 'new' technology

Sheppard (2011, p.12) argues that "the introduction of anything new brings with it considerations for learning and pedagogy." Whilst the ubiquity of tablets suggest that they are not new technologies anymore, teachers need time to understand their benefits in teaching and

learning. Teachers may feel that they require more professional development in the use of technologies to enrich and enhance all areas of the curriculum (Christensen & Knezek, 2017). Literature about tablets usability in the classroom is increasing. *The Case of the iPad: Mobile Literacies in Education* (Burnett, Merchant, Simpson, & Walsh, 2017), which is a compilation of studies about mobile literacies in a variety of educational settings, is just one example among the recent literature on various issues which may arise with regard to tablet usability in classroom environments.

Until some years ago, several authors (e.g. O'Mara & Laidlaw, 2011; Miller & Warschauer, 2013) were still claiming that there are few conclusive studies on the educational use of tablets and the benefits of their use in schools. Furthermore, Wakefield & Smith (2012, p.643) state that:

> …little research has been reported in professional journals that describes ways in which educators can integrate the technology into teaching and learning in order to capitalize on the opportunities or overcome the challenges they will likely encounter as they move to integrate mobile devices into university coursework. (p.643)

Other authors argue that most of the research on children's use of tablets has been based either in preschool settings (Roskos, Burstein, & You, 2012; Hutchison, Beschorner, & Schmidt - Crawford, 2012) or focused on children with special needs (Cardon, 2012; Kagohara, et al., 2013).

Recent literature (e.g. Christensen & Knezek, 2017) identifies challenges as to how tablets can be integrated into curricula in ways teachers can work with. Tablets pose a new challenge for teachers (Wakefield & Smith, 2012) and they face difficulties in integrating this relatively new technology into the curriculum (Lorenz & Kikkas, 2011). Similar findings were outlined by

Nguyen et al. (2015, p.197) who noted that whilst iPads were used individually by students, they were not integrated, "within a holistic teaching and learning approach". Students were very proficient in the use of technology but noticed, "lack of innovative pedagogical guidelines" (p.197) and little evidence that this device is improving the learning outcomes. They also found out that mobile phones are not integrating contents into the social learning environments but rather they are used only to enhance learning. In other words, no transformative learning has been taking place. Wohlwend (2017, p.49) asserts that teachers have to, "update the pedagogies we offer to young children who are immersed in rapidly shifting technologies, literacies, and global innovation."

Understanding teachers' difficulties in integrating tablets within their teaching is crucial. Ertmer et al. (1999) describe two types of barriers to technology integration: First-order extrinsic barriers which focus on technological hiccups in a school, up-to-date training on using technology in the classroom and support and second-order intrinsic barriers which focus on teachers' perceptions of technology, such as whether or not it adds educational value to their work, and the level of comfort they have to use it.

First-order extrinsic barriers are also explored by other authors such as Howard (2013) who suggests two reasons for teacher's resistance to technology integration: (a) teachers' familiarity with technologies and their contribution to literacy skills is limited; (b) teachers may hold negative views towards the role of media in young children's lives, particularly during the early years. Through their analysis of teachers' constraints in the use of technology, Ertmer et al. (1999) outline problems which are applicable to the use of any digital device in the classroom. Unreliable hardware, hard-to-use software, and other technical obstacles frustrate classroom teachers and inhibit technology integration. Tablets depend on other technologies, particularly

networks. In addition, educators must also care for technologies themselves. As Grant & Basye (2014, p.219) posit: "Students may not be the most cautious caretakers of computing devices, and adults may be careless with a device." At the same time, since technology is changing rapidly, educators have to always keep abreast of technology changes and get used to how new devices work. Since the first introduction of PCs in schools, with office software being the main application used, the technological world has changed its economic and social profile in undreamt of ways. Yet, O'Mara & Laidlaw (2011, p.151) noted that there is little evidence that when tablets are used with learners, their usage is truly different from the "drill and skill" programs that students may already be using during "computer time" in the classroom or in their school computer labs. Lankshear and Knobel (2006, p.55) identified several cases in classrooms where the use of technology was rather, "to perpetuate the old, rather than to engage with and refine or re-invent the new". There is much literature (Schrum, Shelley, & Miller, 2008; Gu & Day, 2007; Wang, Ertmer, & Newby, 2005) that shows that teachers are often afraid of changes and sometimes conservative to adapt to new technologies. The approach adopted is often linear, teacher-centred and often resistant to change. O'Mara & Laidlaw (2011, p.158) stated that, "Often teachers are afraid of the openness and "unfamiliar territory" of the new technology, so restrict what can and can't be done, creating a closed approach and system."

This may raise difficulties which Ertmer et al. (1999) describe as second-order intrinsic barriers, which focus on how teachers perceive technology and whether these perceptions mean that they are able to integrate technologies into their teaching and learning. They ask three main questions about "how" technologies are being used:

> 1. How are teachers using computers in the classroom? How do these uses relate to their beliefs about the role of technology in the curriculum?

> 2. What value do teachers assign to technology? What are their reasons for use? What are the perceived barriers to use?
>
> 3. How do teacher beliefs about classroom practice (e.g., role of technology or management style) shape perceptions of critical barriers to technology use? (p.57)

These questions can be applied to teachers' use of tablets and may offer a self-reflection guide to enable teachers to overcome some of the barriers.

2.3.2 Portability

The advantage of tablets over other portable devices is mainly their small size, as a keyboard-less computer embedded in a touch screen. While a large number of apps have been created, thanks to the existing platforms that facilitate this, it should be noted that flash-based educational websites are still common and not available on most tablets. Hashemi et al. (2011, p.2479) state that:

> …small mobile and PDA screens limit the amount and type of information that can be displayed. There are limited storage capacities for mobiles and PDAs. Batteries have to be charged regularly, and data can be lost if this is not done correctly. (p.2479)

Most tablets do not have USB ports and despite the fact that nowadays there are several Bluetooth keyboards for tablets, many prefer to use desktops or laptops with larger screens and full version of office software rather than second-rate app tools. Grant & Basye (2014, p.129) advise that before purchasing tablets in bulk, "it's important to investigate how these devices will work with existing hardware, such as desktop computers, printers, and interactive whiteboards."

However, there are other concerns with regard to tablet portability besides functionality. Tablets come with the promise of anytime-anywhere-learning education and although this has a number of advantages, it is not trouble-free. Dempsey, Lyons & McCoy (2018, p.3) mention several, "indirect effects such as sleep, smartphone addiction and mental health." However, it is important to note that issues such as these are contestable and claims are often made about, for example, technology addition, based on limited or questionable evidence.

Conole and Dyke (2004) raise a very important concern regarding the speed at which information can be exchanged. In their own words, "The speed with which information can be exchanged via the web and email has led to a shift in user expectations in terms of response times to requests from other users" (p.120). Selwyn (2014, p.155) states that "the lives of many people are now regulated by smartphones, tablets, Wi-Fi and other requirements of being 'always on'". Edwards et al. (2016, p.322) argued that cyber-safety awareness has become a difficulty that childhood education has to face every year because, "touch screen mobile technologies have quite literally put the Internet at the fingertips of pre-schoolers" (2016, p.322).

Due to their portability, tablets pose unprecedented problems with regards to e-safety. Lorenz & Kikkas (2011) mention several possible dangers including cyber bullying, prank calls and talking to strangers. They state that, "parents and teachers are usually in a weak position to supervise students; they are usually left alone with these problems and have to develop their own strategies to deal with these matters" (p.19). It would be erroneous, however, to think that children don't require any help from adults (Livingstone, et al., 2013) because of their presumed familiarity with the digital world. In Ktoridou et al.(2012, p.140)'s words, "being digital literate does not imply awareness of the internet dangers and knowledge on protective

measures." In other words, what these authors suggest is that there is a difference between having a good mastery of software and hardware, which is likely to be the case of the majority of young people, and "mastering a set of core competencies" (Gilster, p.1998, p.3). The latter includes the ability to think critically and make good judgement. Ktoridou et al. (2012)'s reasoning is twofold, as they note that, "Each new generation of internet users is more skilled, capable and advanced than the previous one" (p.134) and, "at the same time parents are afraid that their children might become addicted to it and isolated or even victim of electronic crime" (p.134). However, support from parents or carers should not only be to ensure that children are safe online but also to enable them to become good critics of online content by reviewing and evaluating information and protecting their e-reputation. As Plowman & McPake (2012, 31) assert, parents/carers should be there for their children to, "monitor activities, help when things are difficult, provide encouragement and praise for achievements, and assist children in managing their emotions if they get frustrated".

Since Lorenz & Kikkas' (2011) research, social media apps which can be available on tablets and mobile phones have increased exponentially, and trends have also changed. One of the current, underlying fast-growing trends amongst young people is the use of messaging apps and platforms, and anonymous chat. Understanding these trends and apps which young people are finding 'cool', is very important for all those who work with young people.

The "anytime-anywhere" aspect of tablets is great for immediate access, but it also implies that students may have quick access to websites, videos or games that they should not be using during that lesson. A consistent finding (e.g. Wakefield & Smith (2012)) is that tablets could potentially be a distraction to students and the functionality to switch from one app to the other as well as having internet "always on" do not help in this regard. Flewitt et al. (2015, p.295)

state that the practitioners in their data set were concerned that “carers/parents spent time texting rather than talking to their children” and this would deny them from the attention they should be given. However, it should be stressed that these are perceptions, and the evidence for these impacts is limited.

2.3.3 Choosing apps

As Moore (2017, p.23) claims, “one of the most difficult technology-related decisions for teachers is choosing appropriate apps.” As in any other professional field, teachers want to find apps that enable them to reach their learning objectives. Apps that foster digital literacies may also support inquiry-based learning (Cavanaugh, Hargis, Munns, & Kamali, 2013) and as a result, teachers’ pedagogies have to be adapted too. Knowledge and support for teacher learning is therefore crucial (Lefstein, 2003 p. 731).

Lawrence (2018) distinguishes between closed-ended apps, which are off-the-shelf products which position learners as passive content consumers, and open-ended apps which allow experimentation and creation, and knowledge construction. Closed-ended apps follow a “behaviourist or transmission model of learning” (p.210). These arguments are on the same lines of the U.S. Department of Education's new National Education Technology Plan (2017, p.7) which describes a “digital divide” between those who passively receive and consume predetermined content and, “learners who are using technology in active, creative ways to support their learning”.

Lynch & Redpath (2014) advocate the shift away from "passive" uses of apps and a constructivist approach which position the child as an active learner, cultivating the unique talents and extraordinary potential that exists in every child. O'Mara & Laidlaw (2011) mention

how the child participants in their "out-of-school" activities, although initially they played the closed-ended "drill and skill" activities, after some time they found them "boring" and preferred open-ended apps which allowed more creativity. Moore (2017, p.23) states that, "for children to engage in creative meaning making based on their interests, they need opportunities to explore open-ended apps that allow some individualized control over creating content". There should be room for innovation and improvisation and a balance between structure and freedom (Hobbs, 2017). The organisation and provision of professional development is therefore crucial to enable teachers incorporate technology experiences into teaching and learning (Moore, 2017; Neumann & Neumann, 2014).

2.3.4 Tablets are expensive to purchase and support

The implementation of tablets in classrooms comes against a huge cost both for the purchasing of hardware, i.e. the tablet itself, educational apps and other software which may be required such as mobile device management systems and also the building of the infrastructure required such as wireless networks. Selwyn (2016, p.112) referred to Richard Heeks (2008) who implied that the One Laptop per child posed a great financial burden and placed pressure on governments to commit to such huge order of devices. I find this very similar to what we have experienced in Malta in the implementation of the One Tablet per child initiative.

Furthermore, one must also add teacher training. Dias (2017, 341) state that "The tablets are expensive to purchase, and the cost of maintenance is even higher.' They explain that:

> Tablets are more fragile than computers; parents and teachers are concerned about the damage. In addition, these gadgets are expensive and when dropped or misplaced the loss is quite big as they are costly devices. There is also possibility of theft of the devices at school. Parents' concern is how this could be replaced (p.342).

A roll-out of tablets similar to the One-tablet initiative in Malta requires huge investment both for the initial outlay, which includes the infrastructure required for network, and the ongoing maintenance. This also entails huge investment of wireless hotspots and a large-scale network topology. Ironically, the considerable investment in technology and the large percentage of the annual budget dedicated to education may perpetuate what Selwyn (2014, p.155) describes as, "issues of inequality and exclusion; power differentials and unequal social relations; the uneasy correspondence between education and (global) economics; and the privatisation and commercialisation of public services."

Investment in adequate and reliable network also adds to the financial expense of education authorities. However, if students are not provided with a tablet, a school-based or nation-wide Bring Your Own Device (BYOD) programme may deepen the socio-economic inequity inherent in the schooling system. As pockets of poverty in the periphery rise despite economic growth, this technology in education boom, unless implemented with caution, may increase the digital divide.

This brings social inclusion challenges. An understanding of the complexity of poverty trends and the digital and social divide is crucial in the implementation of the use of tablets in classrooms. The local Minister of Education in Malta, Mr. Evarist Bartolo asserted that there is a link between poverty and good education (Bartolo, 2016; Sansone, 2016). There is in fact some research which supports this claim, for example the work of Willis (1977), whose renowned book is titled "*Learning to labour: How working-class kids get working class jobs*". Willis sheds light on the difficulties of working-class families and particularly those below the poverty line to succeed in education. Hall and Coles (1999, p.91) found out that the lower the socio-economic group, the fewer the number of children who engage in reading. Reay (1998

p. 523), maintained that, “the working-class students are differentially positioned in relation to knowledge of, and confidence in relation to, higher education.” There is, therefore, a range of research that indicates that there are already significant social inequities in the education system, due to the differential economic capital of families. Should a ‘Bring Your Own Device’ (BYOD) programme be introduced in schools, careful considerations of the financial difficulties it may incur should be taken (Pegrum et al., 2013). Otherwise, these inequities will be perpetuated.

The socio-economic problem has to be understood also in relation to the proliferation of different cultural groups as a result of immigration. Even though Malta is a small country, diversities are increasing due to immigration (Schembri & Attard, 2013). Foreigners living in Malta do not only arrive by boat from Africa, but there are a number of Italians and Eastern Europeans and other minorities (Ibid.). Prinsloo and Rowsell (2012, p.273) state that meaning is shaped by place and context, and diversity and multi-culturalism foster heterogeneity and multiple meanings. Rowsell et al. (2013) delve further into this area of situated learning and focus specifically on iPads. They state that:

> Even if technologies are the same when they enter a context compared with other contexts, an essential dimension to any research on technologies (and new literacies, for that matter) is how local specificities point to divergent practices. (p.351)

If tablets are to be introduced in classrooms, therefore, this needs to be done in ways that are sensitive to the cultural backgrounds of pupils.

2.3.5 Summary

As this section has outlined, there are a number of challenges in relation to the use of tablets in the classroom. It would be wrong to think of iPads as offering a magical solution to literacy problems and all educational problems. Rowsell et al. (2013 p. 351) state that media and literature tend, "to romanticise technologies like iPads as a panacea, an answer to the challenge of 21st-century literacy education." Despite the fact that there is an amount of self-learning which takes place, the role of teachers is vital in the classroom. Several authors (e.g. Rowsell, Saudelli, Scott, & Bishop 2013; Livingstone, Wijnem, Papaioannou, Costa, & Grandio, 2013; Kucirkova, 2014) argue that it would be erroneous to think of tablets as a magic wand to solve literacy problems. Providing tablets is not an infallible formula for better educational achievement. The change should not only be in the type of educational resource or 'tool' used, but also in pedagogy and practice. Livingstone et al. (2013, p.219) describe technological determinism, which includes the optimistic and pessimistic perspectives that "digital media are changing everything", as a myth. It would be a mistake to think that the use of tablets would inevitably give us better results than other educational resources. Kucirkova (2014) also debunks the claims that place technology as being superior to other resources such as books. Rather, we should consider the value of both digital and non-digital experiences.

As this literature review indicates, tablets offer an unprecedented level of individualisation, planning, immediate access to web 2.0 tools and research and communication. However, the literature also shows that tablets present a range of challenges, as described above. Moreover, despite the ubiquity of tablets (Miller & Warschauer, 2013), teachers need time to slowly get used to digital devices and integrate them into their teaching and learning (Cavanaugh et al., 2013). The literature on the use of tablets in the literacy curriculum identifies the challenges that educators face in embracing these new technologies (e.g. Schrum et al. 2008; Gu & Day,

2007; Wang et al. 2005; Lankshear & Knobel, 2006), as well as emphasising the understanding that empowering students to become global digital citizens is the way forward (Cavanaugh et al., 2013; Laidlaw & Mara, 2015; Pegrum et al., 2013). To this end, it is frequently argued that teachers need to be focused on developing pupils' so-called '21st century literacies' (e.g. Jenkins 2006). There are numerous frameworks that have been developed in order to guide professionals, such as the European Framework for the Digital Competence of Educators: DigCompEdu (Redecker & Punie, 2017), but few that are grounded in the field of new literacies, in which an understanding of the way meaning-making is evolving in the digital age is central. For this, we need to turn to the work of Burnett and Merchant (2014), who developed a 'Charter for 21st Century Literacies'. This is outlined in the next section.

2.4 Charter for 21st Century Literacies

Burnett and Merchant (2018) developed the Charter for 21st Century Literacies in order to ensure that literacy practice in schools is informed by children's experiences of literacy in out-of-school contexts. Earlier literature identified the difficulties that early years students face because of differences between their literacy in life and school (McNaughton, 2001). Burnett and Merchant (2018) make it clear that this disparity still exists in contemporary society.

Burnett et al (2014, p.160) suggest that school literacy be seen as singular in nature and, "defined in terms of individual developmental progress". They also state that unique linguistic and social backgrounds must be valued and affirmed. Verbal written text is still predominant in school literacies, as opposed to home literacies, which are increasingly marked by multimodality. Linearity and fixity in school contexts also contrast with constructed texts in

home literacies which are often provisional. Another distinction between out-of-school and schooled literacy is authorship, where individual contribution is valued at the expense of collaboration. Whilst schools perceive literacy as a set of objective skills, home literacies are more embodied in experience and situated. Schools mainly rely on individual construction of meaning as a strategy for further improvement. On the other hand, Burnett and Merchant (2018) argue that literacy "has a social function" (p.160) and that shared values emerge via meaningful and participatory meaning making. School literacy programs aim to empower students with interpersonal and intrapersonal skills and prepare the young generation for the future. Literacy in school is about "adhering to a set of established rules". However, literacies are culturally and socially situated, and meaning-making practices are shaped by one's prior knowledge and experiences (p.160).

Given these tensions between home and schooled practices, Burnett and Merchant (2018) developed the Charter for 21st Literacies in order to enable teachers to reflect critically on these tensions, and to be able to incorporate some of the aspects of out-of-school literacies into classroom practice. The Charter consists of nine principles, which are outlined below.

(i) Acknowledge the changing nature of meaning making

This principle acknowledges the linguistic and social resources learners bring to the classroom, while urging them to broaden the scope of open practices in which they take part. Despite our impression of social media and video games trends, their uses may "gloss over diversity and difference in children's digital lives and their everyday experiences of digital literacy" (Burnett and Merchant, 2018 p.27). Burnett et al. (2014, p.161) draw on Prinsloo (2005) to argue that "their uses may reproduce inequalities rather than eradicating them".

Similarly, Pahl & Rowsell (2012, p.146) argue that, due to changes in the way information is presented and as we become more globalised, "increased inequalities in urban spaces make it more urgent to harness the skills of young people to education and to foster their literacy development". This "'empowering' literacy education", as described by Burnett et al. (2014, p.160), leads to another recognition of children's unique backgrounds, which entail that they create meaning for themselves and also of their literacy comprehension.

(ii) Recognise and build on children's linguistic, social and cultural repertoires

This principle outlines the importance of recognising and building upon students' repertoires of textual practices. It entails the schools' full awareness that, "the orchestration of semiotic resources" (Burnett et al., 2014, p.161) is important to produce socially recognisable meanings.

For as Prinsloo and Rowsell (2012) state, even if semiotic forms are identical, meaning is shaped differently across different cultures and people perceive of meanings in very different ways. To overcome this difficulty, educators need to understand students so that they can teach them in a better way (Kincheloe et al., 2011). We need to look at constructed texts in home literacies, which are often provisional. As Pahl & Rowsell (2012, p.133) recommend, "We should try to locate teaching and learning within the identities our students bring to our classrooms". They argue that new literacies, "…can provide opportunities for children and young people to merge home experiences and funds of knowledge with content area literacy from school" (2012, p.86). The portability of tablets, while strengthening the home-school link, is changing how the sense of ownership of learning places is being constructed. Tablets are contributing heavily to digital storytelling, creativity and communication.

Tablets also enable the creation of multimodal digital stories, which lead to another practice that educators need to develop in classrooms.

(iii) Acknowledge diverse modes and media

This principle acknowledges the role of multimodality in meaning making. Unfortunately, as Burnett et al. (2014, p.161) posit, "…verbal written text is still predominant in school literacies as opposed to home literacies which are increasingly marked by multimodality". The focus in Maltese schools has been on the process of reading and writing acquisition. As Pahl & Rowsell (2012, p.44) argue, "Reading implies the skills of decoding words, but it also involves using visuals to comprehend texts, using spatial dimensions to problem-solve in space". The increased pressure of focusing on literacy skills such as comprehension and letter recognition ignores the rich potential of 21st century literacies in touchscreen functionality, use of sound and visuals, and apps which enable digital media production. Various learning tools can be used to enhance literacy and writing skills in creative and amusing ways. Tablets definitely fit in this definition of multimodality and, as Yelland & Gilbert (2018, p.154) argue, they, "enable [pupils] to create multimodal texts to represent and communicate their ideas and understandings." This principle recommends that we should be mindful to what children learn at home and how literacies are being constructed. Children download story maker apps, they record their own voices, search videos about topics of interest including animations. They spend time in unstructured play, which may enhance their creativity, problem-solving and other competences.

Pahl & Rowsell (2012, p.86) argue that:

> Classrooms of the future may incorporate the ways in which homes work. At home movement across sites and across nodes may be happening much more quickly and to a different timeframe from that of school. We need to examine what literacy activities our students are engaging with out of school and consider how we can form bridges to support students within school. (p.88)

This entails ensuring that the school environment incudes similar literacies to those children would see at home. The next principle, therefore, discusses how meaning making is constructed through various interactions while drawing upon children's own experiences.

(iv) Recognise the affective, embodied and material dimensions of meaning making

This principle aims to "allow for students to explore what texts mean to them and share emotional, personal and situated responses" (Burnett et al., 2014, p.163). Burnett et al. also state that when children use mobile touchscreen technology, they create meaning unique to the context of the interaction (2018, p.50). Students make meaning from stories or videos through which they extend their knowledge while relating to their own experiences.

As Pahl & Rowsell (2012, p.86) accurately put it, "opening out the affordances of multimodal meaning-making to the digital can let in many other kinds of meaning".

(v) Encourage improvisation and experimentation

Improvisation and experimentation comprise an element of creativity when it comes to the production of intelligible text. They involve a diversity of literacy activities and a good combination of planned and spontaneous experiences.

(vi) Use entertaining pedagogies

What counts as literacy is beyond the mere chalk and talk, paper and pencil. Active learning involves meaningful games, solving problems and exploring.

Pahl & Rowsell (2012, p.60) state that:

> When children compose in the classroom, their composing process should be accompanied by play, gesture, drawing and talk. Students may use drama, songs, photography, multimedia, such as Facebook, blogs and wikis and digital storytelling as well as everyday practices such as texting, emailing and craft activities to communicate meaning. (p.60)

(vii) Create opportunities to work with the provisionality of digital media

Meaning must be generated through different texts, contexts and situations. Awareness of a range of meaning-making opportunities also entails, "reviewing how we position ourselves and how we are positioned by others as we do so" (p.164). Meaning must be generated through different texts, contexts and situations which distinguish between the self and the others.

(viii) Provide contexts that facilitate criticality

This principle highlights the importance of creating an environment in which students feel safe and supported so that they can experiment and collaborate with each other in the production of meaningful discourse. The best use of hardware and software including quick internet, better bandwidth, and latest web developments, should enable students to navigate information and make more informed decisions. They need to develop critical skills in the uses of technology. These recommendations should be endorsed by schools to future-proof the students' competences required for the 21st century.

(ix) Promote collaboration around and through texts in negotiating meaning

This principle includes spontaneous, loose ad-hoc collaboration, which may allow inquiry-based learning as well as successful collaboration. The social nature of meaning making enriches the literacy experience of children. Lawrence (2018) found that tablets, in general,

seemed to invite social interaction and that, “many of these forms and types of play have been adapted from typologies of traditional play” (p.211).

In this study, I examine two Maltese teachers’ practices in order to identify how far these nine principles are embedded in their classrooms and explore the gaps in knowledge and practice that might be evident in order to inform an understanding of future professional needs.

2.5 Chapter Summary

In this chapter I sought to expose the pedagogical affordances as well as difficulties of using tablets in the classroom. Tablets, as educational resources, provide additional support for pedagogical practices. However, they also offer new challenges and in this literature review, I also alluded to some of these concerns. While considering these benefits and challenges, I also managed to identify how the Charter for 21st century literacies (Burnett and Merchant, 2018) can serve as a guide for a meaningful tablet integration.

The study reported in this thesis builds upon this work by outlining a study of a Maltese classroom. Having identified the strengths and challenges of using tablets, the study was set up to investigate whether or not these existed in relation to this classroom, and the study also examined the extent to which the principles of the Charter for 21st century literacies (Burnett and Merchant, 2018) could be identified in practice. Whilst there have been other studies of tablets in Malta (e.g. NAO, 2019), these have not focused on issues relating to new/digital literacies, which is the contribution this study makes to the field.

The next chapter outlines how data was obtained throughout this study, the methodological paradigm and research methods used. The data-analysis procedures will also be explained.

Chapter 3:
Methodology and Methods

3.1 Introduction

This chapter details the research methodology that underpins the study. It includes the research questions, background theory, the context and sample, ethical considerations taken, and the research methods used for the study. The research questions of this dissertation attempt to analyse what the pedagogical possibilities of tablets for literacy learning are, and the challenges faced by educators in embedding them in their teaching and learning. The focus is on how tablets can be used effectively to enhance literacy learning and teaching. Studying this in the local context requires undertaking observations within the classroom context.

The overarching research question is, 'How far are tablets creating new affordances for literacy learning in the Maltese context? In order to address this question, there are three sub-questions:

The study, therefore, attempts to address the following research questions:

1. What are the benefits of using tablets in the classroom?

2. What are the challenges of using tablets in the classroom?

3. How far are the principles of the Charter for 21st Literacies (Burnett and Merchant, 2018) evident in teachers' practices with tablets in two Maltese classrooms?

This chapter describes the chosen methodology and the research methods adopted. In doing so I also discuss the epistemological framework through which I have chosen the research questions, and the approaches taken towards analysis.

The chapter is divided into four parts. The first section outlines the research context and locale of the study. The second section discusses the theoretical framework and methodological approaches to working and doing research with children. It also attempts to outline the methodological framework to the observations I have carried out locally with children. In the third section, ethical considerations, particularly when working with young children, are evaluated. Finally, I outline the methods I adopted and the tools I used to collect the information.

3.2 The research paradigms

Methodology is described by Sikes (2004 p. 16) as the:

> …theory of getting knowledge, to the consideration of the best ways, methods or procedures, by which data that will provide the evidence basis for the construction of knowledge about whatever it is that is being researched is obtained. (p.16)

It is understood here as the logic behind the methods, which as described here, includes the integration of children's voices and all participants.

Hammond and Wellington (2013, p.58) state that epistemology and ontology should be "place[d] together at the top of a hierarchy when it comes to shaping a research project". Ontology explains the essence of things, what kind of world we are investigating and, "the nature of existence, with the structure of reality as such" (Crotty, 1998, p. 10), while epistemology is a, "way of understanding and explaining how we know what we know" (Crotty, 1998, p. 3).

The epistemological outcome in the context of my research is insight into literacy teaching in a Maltese classroom. An assumption I made was that the success of tablets' usability depends on teachers and how they integrate them within their teaching and learning. Observing the teacher, therefore, was as crucial as observing children. I searched for methods that would help me understand the impact of this device on teaching and learning. The contribution of my research to the existing body of knowledge and to the national agenda is the examination of the pedagogical use of tablets in a real context, demonstrating the benefits and challenges faced by teachers when using this device and identifying how far it is enabling them to reach better their learning outcomes. Statistics do not show how hardware is actually being used in class. Quantitative studies are used to gather information and provide a general picture. On the other hand, quantitative studies provide a broad but shallow view, in the sense that they do not always encompass opinions and open-ended questions. It was for this reason that by the 1970's there was a shift to qualitative research, especially due to, "unresolved problems in 'positivist' research" (Hammersley, 1997 p. 144).

Although my initial approach stemmed from my experience in digital literacies and education, particularly the usability of tablet devices and how they can be used in a meaningful way, eventually I took a more interpretivist approach since I was more interested in looking at, "the internal motivation and the human agency that constitutes social activity" (Hammond and Wellington, 2013, p.58). Data development was an in-depth process over a time-span of about 5 months, where I examined a class teacher's use of tablets. From the very beginning, I also shunned the idea of having a staged lesson or a sort of 'ideal' lesson delivered by a tech-savvy teacher, in order to avoid constructing the reality I purported to investigate. The research questions entailed having a real-life scenario, which enabled me to discover challenges, rather than just scratching the surface and considering only good examples of tablet usability.

From an epistemological point of view (which concerns the nature of knowledge), "what constitutes knowledge and what it is possible to know and understand and re-present" (Sikes, 2004, p.21). In this research I was inspired by Clark and Moss (2001) but my desire to pursue a fully participatory approach to research was not achieved in practice in relation to either the children or adult participants. The participants were not involved in identfying the research questions, analysing the data or contributing to writing, and in that case the research was not fully participatory. However, I saw the participants as constructors of their own knowledge rather than passive sources from whom the researcher may extract meaning. This approach entailed having to observe, or as Pink puts it, "sense" (2009, p.10). This implied engagement with the materiality of the school and the "sensoriality" of the daily classroom activities including rule frames, morning assembly and prayer, and so on.

Christensen & James's work (2001) and that of Gallagher, Haywood, Jones, & Milne (2009), were quite influential in the development of this chapter because one of my intentions was that children should be actively involved in the research. This was important because I believe that both teachers and students are key players in the outcome of any lesson and educational programme.

3.3 Locale of the study

The research reported here was carried out on a span of 20 lessons observed in a school (from February until June 2016). The child participants in the current study (N =10) were Year One students from two different classrooms who ranged in age from 5 to 6 years old (M = 5.2 years). One of the children had hearing problems and was provided with a one-to-one Learning

Support Assistant. This child did not follow English lessons in order to avoid confusion as advised by the Access to Communication & Technology Unit.

The school used in this study (which I shall be referring to as 'St. John Paul') was willing to discover the benefits of this new educational tool. This was the main reason why I chose to work in this particular school. The student population was not diverse with regard to ethnic background. In fact, the background of the majority of students was working class and Roman Catholic. My perception about the socio-economic status of children is derived from my conversation with parents and with the Head of School. Studies such as (Cefai et al., 2009) and Cutajar (2006) also suggest that the location of the school is in a working class area. With respect to the ethical considerations, I did not seek information about their financial background directly from participants. The quaint surroundings of the school consist of a mixture of abandoned, historical buildings and post-world war II apartments and dwellings. School walls were decorated with paintings. The school used phonics but did not follow a particular phonics syllabus.

As in all Maltese schools, prior to the 'One tablet per child' project, wi-fi was not available in all classrooms. A room was used for technology in education purposes and teachers and children had to move to this room according to a specific timetable. The idea of taking a whole class to a 'computer room' and sending them back to the classroom has long been challenged by the e-learning department within the Ministry of Education in Malta where I worked for three years. Interactive whiteboards and teachers' laptops (now also All-in-one PCs) had already made what were commonly referred to as resource rooms obsolete. The digital literacy vision, as defined by the Department of e-Learning (2015), is that students should have access to knowledge via technology. The advantage of having wi-fi in all classrooms is that access to

the internet becomes ubiquitous and students can responsibly access the internet where, when and how they want.

3.4 Participants

Two teachers, Ms Yosanne and Ms Roberta (all names are pseudonyms), volunteered to participate in my study. In the school there was a set of tablets and both teachers wanted to benefit from their potential to their teaching and learning. During our informal meetings in February, I discussed with them my plans and they shared their enthusiasm and willingness to use the tablets available in school to enable children to become independent learners, to build digital skills and competences and access language resources. At the same time, the teachers insisted that the observations would not hinder their normal work. Both teachers were young, relatively enthusiastic and hardworking. They had a natural confidence to teach, sing and motivate the students, and had the disposition to teach young children. Both were university graduates, one of whom graduated in Education. The Ministry of Education demands that every regular teacher possesses a degree in education. Until recently, this was either a Bachelor in Education or a post-graduate certificate in Education. Nowadays, both the former and the latter have been replaced by a Masters in Teaching and Learning. Lack of any of these qualifications will automatically relegate one to be employed as a teacher only on a temporary basis. The enthusiasm of one of the teacher participants, Ms Roberta, and her willingness to work was often met with frustration, given the fact that at that time her teaching post was temporary. Both teachers were not tech-savvy, but Ms Yosanne was more willing to experiment with new digital media. Ms Leanne was the Learning Support Educator who assisted Jennifer, a girl with hearing impairment.

Both classrooms were highly decorated with several teaching aids and colourful charts. Like all classrooms in Malta, they were equipped with an interactive whiteboard, an all-in-one PC and four personal computers at the back of the class. Currently, a hardware refresh is going on and these assets might be upgraded at the time of publication of this thesis. A door linked both classrooms. This door was kept open on several occasions, thus enabling collaboration between teachers.

I also had meetings with the e-Learning support teacher, Ms Mandy, who used to visit the school once a week. Her role was to support the teachers in using technologies and implementing digital literacies. Whilst this was of utmost help to the teachers, this limited time was not enough to empower the teachers to maximise the full potential of the digital tools at hand.

Involving children in research can be very difficult and entails a long process. A theoretical background is explained in further detail in section 3.5 and the ethical process discussed in section 3.6. Individual meetings were set up with students and their parents who form part of Ms Roberta's and Ms Yosanne's classes. Eleven parents agreed that their children could participate in the study. A brief description of each child involved in the study, based on my observations of them and those of their teachers, is outlined below (Table 1). All names have been changed. During the period after I was granted permission from the school for this research and before my observation in class I sought ethical consent from parents and students, as outlined in Appendices III, IV, V and VI . This period helped me to familiarise myself with the children and I treasure every minute I spent talking to both parents and children. Initially, I even had plans to further observe children even in their homes and although I was granted this permission by some parents, this did not materialise as I subsequently decided to focus my

empirical study on children's experiences in school. However, these discussions with parents, teachers and children themselves helped me to have a better picture of children and their performance in school. These descriptions are highly subjective, based on my perceptions and those of their teachers regarding their performance in school. There are ethical issues raised in presenting subjective notes on children, as the notes may reflect the limitations of the researcher rather than truly representing the child. Ideally, pen portraits should be constructed by participants themselves, but I felt that the age of the children precluded this.

Table 1: Children who were participants in this research

Ms Yosanne's Class	
Peter age 5	Peter is a very sociable child and gets along well with his peers. Peter needs support with reading, and his parents are happy to give him this support. He enjoys being read to more than reading himself.
Patricia age 6	Patricia has a very jolly character and is quite uprorious. She is an independent learner. Whilst Patricia is motivated and always tries her best, she struggles to remember letters and sounds. Her mother is unable to support her, due to her own literacy difficulties.
Patrick age 6	Patrick reads and writes without any difficulties. He enjoys spending his free time watching videos on YouTube. His parents do not involve themselves in his education.
Philip age 5	Philip has made good progress in that he initially struggled to read and write but then he became an independent reader and writer. He is fascinated with computers and laptops. Peter is supported in his education by his parents
Pamela age 5	Pamela is an independent reader and writer. She has minimal support from parents for her education.
Pierre age 5	Pierre is an independent reader and writer. His reading skills are in advance of his speaking skills. He has a lot of support from his parents.
Ms Roberta's class	
Jade age 5	Jade has a passion for reading. She is very alert and is always very interested to learn something new. At home she also finds space to develop socially, culturally and creatively.
Jennifer age 5	Jennifer is a happy child, always with a smile on her face. She is assisted by a Learning Support educator because of her hearing impairment and for the same reason she has not been yet exposed to the English Language. Due to

	her impairment her parents are quite engaged in their daughter's education and have regular meetings with Inclusive coordinator, learning support educator and the school senior management team
John age 5	John is a very bubbly and jumpy young fellow. He finds it very difficult to focus and be in the same place for a long time. He loves using technology but pretty much just presses all possible buttons rather than following instructions and trying to get to the right answer. He has minimal support at home.
Jacob age 5	Jacob is entertained by technology and spends most of his time at home using a mobile, watching cartoons. He loves tablets but since he is not keen on following instructions, he tries to guess the answers or tries all the options until he gets to the right answer. His mother told me that she wants to take him to places of interest using his tablet where he can take photos and learn. She also regularly reads with him.
Jeffrey age 6	Jeffrey is an able child, but he is more motivated to use the apps that he prefers, rather than the ones that his teacher would like him to use. His mother plays with him and engages with him in meaningful talk.

3.5 Research Context

The introduction of tablets is a challenge for teachers to become more creative and flexible. At the same time, students invariably will have to embrace new approaches to learning and benefit from the opportunities offered. I embarked on a relatively short but focused study, (5 months of weekly observations), within a Maltese school. Admittedly, embarking on this empirical research was not an easy task and, as expected, it was time-consuming. This painstaking but rewarding work was spurred by, "a sceptical temper of mind sustained by critical principles, a doubt not only about the received and comfortable answers, but also about one's own hypotheses " (Stenhouse, 1981 p. 103). It was this endeavour that incited in me a sense of curiosity, enthusiasm and at the same time fuelled my determination to explore the research questions in a critical manner.

Access to schools willing to support tablet-mediated teaching and learning was found to be problematic, since most of the schools had short-term pilot projects related to the 'One tablet

per child' initiative underway before I started my research. Nevertheless, this empirical study was conducted in a perfect time frame; in between a pilot project commissioned by the Ministry of Education as part of the 'One tablet per child' initiative and the roll-out of tablets in September 2016. This was quite an excellent opportunity, since my research did not conflict in anyway with other projects related to tablets.

Another difficulty I had was the time-frame. I had limited time partially due to the amount of extra-curricular activities and therefore fewer contact hours with teachers and students per week, and also due to the Maltese school syllabus, which is well-known to be overloaded. One can also add to this the parent's very high expectations of academic achievement from their children. Furthermore, there is the uneasiness of teachers with regard to using 'new' technologies and sharing their experiences to be taken into account. One of the difficulties I found mirrored that of Hammersley & Traianou (2012), who describe the difficulties a researcher faces in conducting an interview, because interviewees often have limited time to spare. This is even more so in the case of participant observation. All the time offered by the research subjects in my study, therefore, was truly appreciated. Considering all of these factors, I chose a more intensive engagement, which is described by Jeffrey and Troman (2004, pp. 538-542) as a compressed-time mode. A compressed-time mode involves, "a short period of intense ethnographic research in which researchers inhabit a research site almost permanently for anything from a few days to a month" (Jeffrey, et al., 2004, p. 538).

The design of the research was a painstaking exercise. The main challenges were not only logistics and co-ordination, but also the strategic aim of obtaining the best results as far as possible. I did not want a simulated environment and the ideal situation was that the lessons should be as natural as possible. However, the assumption was that participants may tend to

alter their practices in order to look their best in the eyes of the researcher. For this reason, during the lessons in which I had to stay in class, film the activities and take down notes, one of the approaches I had to take was not to be obtrusive. Being 'invisible' is described by Monette et al. (2014, p.231) as becoming a "natural part of the natural setting, not an outsider or as someone in anyway unusual." Notwithstanding the fact that some participants may act differently in the presence of the researcher, Hammersley & Atkinson (2010, p.16) argue that, "we can also exploit it: how people respond to the presence of the researcher may be as informative as how they react to other situations".

While I explained at length to the teachers that my studies would not interfere in anyway with their syllabus and the progress of the children learning to read and write, I also made it clear that my intention was to observe the best use of technologies in daily teaching and learning. I presented myself as a teacher and Ed. D candidate. The focus was on undertaking research with the children rather than on the children. I explained that rather than delving into a feasibility analysis of whether the tablets project may be implemented or not, I was more interested in the way tablets can be used in digital literacies to foster literacy learning.

The rationale used in my research was not to separate listening to children from listening to the perspectives of those who work with them (Clark p.328), including the teacher, the e-Learning support teacher, head of school and other senior management team members. Christensen & James (2000) point out that one can carry out a research study with children without necessarily adopting different methods from those of adults. Meanwhile, I understand that the methods must be designed to facilitate children's engagement in research, and these are discussed at length below.

3.6 Research with children

My research with children took into account the cultural context where they are taking part in many spheres of life from a very young age, ranging from drama classes to students' councils. However, as denoted by Christensen & James (2000), listening to children's perspectives must reflect their own childhood experiences including play and study. Uprichard (2010, p.1) stated that, "the type of research that children are typically involved in, implies that children are competent, knowledgeable and agentic only in terms of their own lives, their own spaces, their own childhoods."

Methodologically, my study adopts an approach where children are perceived as active participants during the whole process. While maintaining their own spaces in their own environment, I tried to observe the classroom not from an educator's perspective but rather that of a student. In order to capture the full context of student and learning experiences in the classroom I drew on Clark's mosaic approach (2011). This method "rests on the experiences of the participants and their active role in the generation of knowledge rather than on age or stage of development" (Clark, 2011, p.328). This enabled me to talk to children in a clear and comprehensible way without being patronising.

Two main factors should be borne in mind when one talks to children. They use their senses to acquire information and infer meaning from what they feel, hear, touch and see. On the other hand, as adults we have to use language comprehensibly with children and make sure that we capture their attention with simplicity but in the appropriate style and manner. This is why much research concerning children rightly tries to understand the contexts which are familiar to them (Clark, 2011, p.322). The places, set activities, rule-frames and settings that a child

experiences matter a great deal in terms of a child's learning and development. Furthermore, technological resources can influence children's interactions and how space is used. Rowe (2010, p.134) states that, "as educators, our questions create particular kinds of spaces for observing and analysing young children's literacy activities". Thus, I had to create a methodological framework which would relate to children's experiences whilst respecting their views and avoiding what Christensen & James (2000, p.12) describe as childhood and children's lives being explored through the eyes of adults. This literature, in fact, has engaged in theorising children as active actors and active participants. In Christensen & James's words, (2000, p.12) such research would be more "child-focused".

Researching children poses a challenge for a study which embraces the aforementioned theories. Gallagher, Haywood, Jones, & Milne (2009, p.1) state that the challenges posed cannot, "be solved simply by adopting special 'child-friendly' techniques" since the principle of informed consent might be quite complex, leading to possible ethical issues which I will discuss later on. Moreover, any so called 'child-friendly' techniques my lead us to listen to children with our own hidden agendas, albeit subconsciously and inadvertently. This reflects the complexity of research with children whose "competency and agency – two key theoretical outcomes of contemporary approaches to child and childhood – are undermined" (Uprichard, 2010, p.1).

These challenges offer a learning experience which ultimately translates into a rewarding academic process. It is a vital exercise for the researcher since it enables him to become genuinely receptive to the children's ideas and perspectives. In Clark's words (2011, p.327), "Engaging in early childhood research can be one way in which to create opportunities for both adults and young children to step back and re-examine the present." A basic methodological

approach during my research was to sit near the children and get in touch with their views. While this can be seen as an added value to research with children, and henceforth also to my own research, it also proved to be a feat, particularly due to the children's developing skills and lack of independence. One of my concerns, in fact, was that children might say what they believe adults want to hear, rather than voice out their own personal thoughts and feelings.

Another point of interest is the impact of new technologies on the learning environment of children. Although my aim was to analyse how tablets can be used in the classroom, my perspective was inexorably drawn to the intra-action (using the term as defined in the literature review) between the child and the hardware. An indication of intra-action I was interested to observe was, for example, handwriting on the tablet, highlighting words and manipulating digital imagery. I observed how children were operating touch screen technologies and paid attention to the apps that let children create and narrate their own digital material. While keeping in mind the objectives of the lessons and the educational outcomes, I tried to focus "on the action rather than its outcomes" (Rautio, 2013, p.462).

I believe that the importance of children's engagement with the devices outweighs by far the impact of technology on pedagogy, teaching and learning. Similar to Nieuwenhuys's teddy bear (2011), the tablet's agency is not derived by its own powers but when children attribute meaning to it. Nieuwenhuys (p.411) describes how the teddy bear, found present in many homes, is a popular character in many television programmes, even poignantly sitting on the tomb of a child who passes away. Yet, despite the various interpretations surrounding the teddy bear, we still do not know exactly who the teddy bear is and what it really means to the child. All the wisdom comes from adults because children's views are not heard and, "the material culture of childhood has remained largely outside the scope of such debates" (Nieuwenhuys,

2011, p.411). Tablets, like the teddy bear, do not derive their power from their own agency but by the actions being performed on them. The emphasis on "intra-action" and analysing children's engagement with the devices can be linked to the aim of using more participatory techniques in order to listen to children's voices.

In Clark's empirical Mosaic approach (2005 p. 5), the methodological pillars are that young children are "experts in their own lives", "skilful communicators" and "meaning makers". Children, therefore, are likely to construct meaning from process during the lessons. The process of meaning-making began with gathering data from children using the apps on the tablets by means of creating and observing, rather than by extracting knowledge (Clark, 2011, p.323) through questions or interviews. In this way, I strove to, "see things from the perspective of the participants" (Crotty, 1998, p. 7).

This approach served me as a guide to involve the children from the very outset of my observations, asking them to take photos and videos themselves. At the end, I also discussed with them which lessons they mostly remembered and found interesting with the intention to extract the pedagogical affordances of tablet devices.

The methodological framework provided an insight into the context of visual ethnography and the relationship between verbal and visual knowledge, which is discussed in some length here. Pink (2009, p.8) describes her proposal of sensory ethnography as a "critical methodology" which departs from classic observational approaches. I will not be so presumptuous as to claim that I am single-handedly introducing this new paradigm, but this research attempts to involve children in the knowledge-production process, and to gather data about how children are using this new technology in the classroom. From the methodological literature, I learned that I could

reflect on the insights gained from diverse visual techniques rather than rely purely on the verbal medium.

3.7 Ethical considerations

3.7.1 Social Responsibility

The nineteenth century English philosopher John Stewart Mill, in his celebrated essay entitled "On Liberty", argued that:

> …the sole end for which mankind are warranted, individually or collectively, in interfering with the liberty of action of any of their number, is self-protection. That the only purpose for which power can be rightfully exercised over any member of a civilised community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant. He cannot rightfully be compelled to do or forbear because it will be better for him to do so, because it will make him happier, because, in the opinions of others, to do so would be wise, or even right (p.13).

Mill's essay was an attempt to divorce law and morality and definitely was not related in any way to research, but it helped me to keep in mind that ethically, I cannot force people into a research study. Research participants should also be told clearly what to expect so that they participate out of their own will.

When conducting a research project, one has to be aware of other ethical issues that might emerge. Clark (2011, p.328) points out that one of the difficulties may be in relation to privacy and what artefacts can be made public. These constraints remain valid irrespective of the participants' age. In addition, there should be a good reason for conducting the research. A research study has to contribute to the educational institution involved, to other known organisations or to society in general. It should not be conducted to satisfy curiosity or confirm a personal theory from which no one else would benefit. It should not be conducted even to get

a qualification (Sikes, 2004, p. 25). As a matter of fact, major institutions and universities including the University of Sheffield insist that the research be part of the professional duties of the candidate. Furthermore, any conflicts of interest should be immediately revealed and dealt with. Part of the precautionary steps I have taken was that I chose not to be part of the decision-making of the implementation of the 'One Tablet Per Child" initiative of the Ministry of Education. At the time I conducted this empirical research, I was not yet an Education Officer and therefore I was not in a position of authority. I also respected the environment of the researched, including the urgency of following the prescribed syllabus, which both teachers complained was too tight. Råheim et al., (2016, p.8) wrote, "The potential for the researched to control what a researcher is introduced to is obviously fully within the rights of the study participants."

Ethical principles are described at length here since the educational research involved children. Billington (2006, p. 158) states that we have great responsibility when working with children, which includes avoiding memories of harm they might have suffered or encountered. At the time of starting my research in school, I was also awarded Endeavour Scholarship Scheme B. On completion of my studies, this thesis has to be submitted in soft copy format to the Endeavour Scholarships Scheme Board within two months from the award of the qualification. However, in section 14.16 – 14.18 of the scholarship agreement between Endeavour Scheme B and myself, it is clearly stated that the research is covered by an Intellectual Property Rights (IPR) and that Endeavour will not seek to obtain any intellectual property rights owned by me or by the University.

3.7.2 Access and Consent

The research was conducted according to the ethics policy of the University of Sheffield (Sheffield, 2012). Two steps had to be taken before the initiation of my observations. First of all, I required an ethical clearance by the University of Sheffield Research Ethics Procedure at the University of Sheffield (see Appendix 1). In this quite rigorous and detailed review I had to state exactly what I was going to do. When this approval was granted from the Ministry of Education, permission was sought from the Head Teacher at the school where the research took place. Following this I sought consent from the 2 main class teachers, as well as the learning support educator and e-learning support teacher (Appendix 2). Teachers immediately consented to be filmed. In the informal interviews, the teachers underlined their expectations of technology in education, with particular attention to the use of tablets. They also commented on their struggles with technology in the classroom. The interviews were perceived by teachers as an opportunity to make their voice heard as educators. Their contributions informed the data analysis, as the transcribed interview data were coded in line with the practices outlined later in this chapter. In addition, I used my own observations of practice in the analysis, and these were not informed by the teachers. There are ethical issues involved in representing teachers in a research study such as this, in that they were both contributors to the research, but also a focus for the analysis. This does create tensions, in that sometimes, there is a dissonance between what teachers say about their practice, and what they actually do in the classroom (Fang, 2006). I attempted to address this tension by discussing the findings from my analysis with the teachers, so that they were aware of any points of dissonance.

I obtained written consent from the parents of all participants involved in the study (Appendix 3). I also obtained consent from the children. The consent sheets were adapted to be understood by children (see Appendix 5). Research with children should follow certain moral,

ethical and legal principles, which have been discussed in some depth in this chapter. This was crucial since it did not simply refer to gaining access, but also considered issues related to preparing the research subjects for the data collection process. I ensured that ethical considerations were observed, and that participants were informed of all aspects of the research study. This approach could establish a more frank and amicable relationship and at the same time ensure more reliable findings (Clark, 2011, p.85). Usher (2000, p. 162) sees this as an "immanent ethical moment" that 'is not purely a function of the application of ethical codes of practice.' Crow, Wiles, Heath, & Charles (2006, p.90) argue that while participants must be fully informed they must not be overloaded with information because they may become bored or even confused.

The information sheet for parents and/or guardians was also provided in Maltese to ensure that participants understood the whole process. Since English is a second language in Malta and the ordinary level exam in English is a requirement in teacher education programmes at the University of Malta, this translation was not necessary for the teacher participants.

Obtaining permission from participants is fundamental. Gallagher et al. (2010, p.2) stresses the importance of, "what informed consent is, who can give it, when it can be given, how it is given and why it is seen as important". In the design of the informed consent process and documentation, I kept in mind these questions and ensured that the children's consent was sought in an appropriate manner. I proceeded with my empirical research only after ensuring that all participants, including parents and children, fully understood all the elements involved. They all expressed their willingness to participate and this has been duly documented.

The need for voluntary informed consent becomes even more prevalent, particularly when research involves participants who are considered 'vulnerable' (Crow, Wiles, Heath, & Charles, 2006, p.84). In my case, although children had submitted the data protection forms in the beginning of the scholastic year, both participant information sheets and consent forms were delivered to teachers and children prior to the commencement of the research. There was certainly a need to adapt the informed consent to the particular needs of the specific target group, in this case, children. Gallagher et al. (2009, p.6) raises several concerns regarding the validity of informed consent when it comes to children. Whilst we, as adults, would easily understand the meaning of 'harm', for example, in cases of abuse, this is not easily comprehended by children. Despite the numerous programmes in schools by Appoġġ (Foundation for Social Welfare Services, 2012) to equip children with core skills and ensure their well-being, harm is a vague term and children might not easily relate the term to a breach of confidentiality (Gallagher et al., 2009). There are also serious concerns where money is involved and, in my case, financial payments were not offered to participants.

I immediately understood that the consent forms could not be a one-time transaction. Alderson and Morrow (2004, p.7) emphasise that consultation has to be "sensitive" and "transparent". The information and consent forms for children were mainly nontextual and made abundant use of drawings. It consisted of pictures and very simple English or Maltese explanations. Basically, children were informed that they were going to have 20 lessons using tablets, that I was going to be present, that the lessons were going to be filmed but they could choose not to be filmed. Children were asked two simple questions: whether they give their consent to participate in this study and whether they accept to be filmed.

The work of Gallagher et al. (2009, p.8) was extremely eye-opening in the planning of my consent form, particularly in relation to the number of concerns they raised about the "problems" of gaining informed consent. They identified "problems of information", "problems of understanding", "problems of authority", "problems of capacity", "problems of voluntarily" and I made it a point to address these issues. The decision to create an information sheet and consent form for children, predominantly pictorial with very simple sentences and avoidance of difficult terms, was one of the measures I made sure to implement.

3.7.3 Confidentiality

At the heart of the ethical considerations also lie a number of responsibilities, including respecting privacy and ensuring safety. Although there were no issues of personal safety, common sense was exercised at all times. Charging of tablets, for example, was always done under adult supervision. Under no circumstance were children allowed to disassemble, hack or tamper with hardware, software and other accessories. Privacy of all the participants was respected at all times and a number of measures were therefore taken. All participants could choose to be researched but not necessarily to be filmed. Data were not used for other purposes other than for this research. Videos and notes taken were not published or shared, neither within nor outside the school. Participants were assured that the results were going to remain anonymous. Data observations were logged by me in a diary which could only be accessed by myself and, when not in use, was securely locked away. Video clips were recorded on an SD card, which was also securely stored. All data transferred on the PC was not shared for any reason on the cloud. My laptop and other hardware were password-protected, and data could not be accessed by anyone other than me. The resulting data was not shared with teachers or parents. Films recorded by students were saved on tablets and securely stored at school.

Immediately after every session, data was removed from every tablet in order to prevent unauthorised access to data. All recordings and notes were stored on my personal hard drive.

3.8 Research Methods

In this section, I outline the methods used as part of my empirical research.

3.8.1 Reflective diary

The reflective diary was a useful tool for recording entries about classroom experiences. It also enabled me to jot down some reflections. Vinjamuri, Warde, & Kolb (2017, p.934) write that the, "reflection process enables learners to critically analyse their experiences and capture the wisdom that lies within them" and develop new knowledge, approaches, skills, ways of thinking, and attitudes. The diary enabled me to jot down research notes and personal comments on my own work.

In my notes I found it very useful to detail the three models of literacies identified by Wohlwend (2017), which inform us how children use tablets. Wohlwend (2017) described three models of literacies: digital literacies, participatory literacies and socio-material literacies. Digital literacies describe the core competences to master technologies, in this case tablets and the skills required in the digital age. During my observations I jotted down whether or not the following digital literacy learning outcomes, adapted (not verbatim) from the Learning Outcomes framework were reached:

- Ability to identify and articulate information needs
- Expressing themselves creatively through digital media and technologies
- Collaborating with others in learning

- Ability to care for tablets
- Ability to switch on/off tablets and access apps.

Participatory Literacies are defined by Wohlwend as the ability to share online. In this thesis I was more interested in how students use apps to generate their materials and visuals, construct new knowledge and share it with their peers. I was intrigued by the cooperative and communicative environment which can be created by tablet usability. Through play and activity, children could construct their knowledge with teachers as mediators to facilitate learning. Shukla (2014) argues that, "With creative play, children flourish" (p.91) and that "play fosters language skills" (p.89). Observing children's language and problem-solving as well as their interactions with others was fundamental in an early-years classroom.

Socio-material literacies relate to the interactions of humans with technologies "without privileging the human and suggests the extended reach that is enabled by machine–human–material integration through connected networks and augmented realities" (Wohlwend, 2017). Videos enabled me to observe deeper the vocalisation of children. I also noted attentively the movements, gestures, facial expressions and how they intra-acted with the device.

I considered the following criteria as crucial in my observations to be indicators of success, in line with the literature reviewed:

- The use of tablets was not superfluous.
- Tablets as digital literacies were used to enhance learning.
- Without tablets, learning objectives would have been more difficult to achieve.
- Tablets were used to make learning more effective.

What is even more interesting is that data were also generated from the class setting and from daily activities which were developed. As Jewitt (2007 p. 276) states, “the classroom is itself a multimodal place with visual displays and an arrangement of furniture in space” and often talking and writing are accompanied by “image, gesture, movement and posture, among other modes.” Observation of the physical and social environment as well as verbal and non-verbal interactions, daily rule-frames and activities was paramount. The building tells us a lot about the area but not necessarily about the social environment of the people. The methods used to capture these data are outlined below.

3.8.2 Visual research methods

The use of visual and audio technologies is frequently employed in ethnography and small-scale studies e.g. (Pink, 2007). The use of visuals, such as photographs and videos, has always been an important element in ethnographic research, but the use of digital media undoubtedly has facilitated it. It would suffice to mention ‘*The Working Images Conference*’, an initiative developed between the Visual Anthropology Network and the *Teaching Anthropology* (2004) journal, which explored the use of digital media in cross-cultural research (Coover, 2004), examined the limits of traditional fieldwork practice, and considered the rise of new information and communication technologies (Murdock, et al., 2005). Pink (2007, p.1) states that “photography, video and hypermedia are becoming increasingly incorporated into the work of ethnographers”. Photographs and videos mirror certain socio-historical contexts, although Pink (p.168) argues that they are constructed realities. They play a major role to inform the public and there are many cases where they have been influential and have had an impact on society. Whilst “visual explorations produce useful data for understanding how people experience their social and material environments” (2007, p.28). Pink also argues that

meaning is constructed in film through visual and technical signification (2007, pp. 177-179). While theory about video and photo research methods is relevant to the discussion and can be expanded further, their use in my research was simply to capture the classroom experience and to revisit and analyse these experiences.

In order to have the full picture of the lesson, with all its ups and downs, I used the laptop camera which, from a distance, covered most of the classroom. This enabled me to "preserve the temporal and sequential structure" (Knoblauch, Schnettler and Raab, 2006:19), to obtain a historical view (Jewitt et al., 2009) and reflect on different parts of the lesson during my analysis. While mindful of Pink's (2007, pp. 177-179) work about the construction of meaning in film, the informal recording of lessons by myself and by the children enabled me to have a realistic picture of part of the lesson. Research participants, even the children themselves at times, were provided with access to video recording equipment and training to ensure they could use it to document an aspect of the lesson which they thought was important. Children were also involved in capturing part of the classroom experience which they found most relevant to them. Colliver & Fleer (2016) maintain that, "young children can offer a unique perspective".

Since the main subject of this study was tablet usability, I filmed those parts of the lessons where tablets were used. In some cases, however, I also filmed when teachers were not using tablets so that I could compare tablets to other technologies, such as the interactive whiteboard or non-digital tools. This enabled me to notice the challenges that teachers face when using tablets and when they preferred to use other learning tools. Some of my excerpts focus on details of how children were using the touch facility. Other excerpts were taken by the children

themselves because these provide information about what they found meaningful and interesting to them.

Another visual method I used was photography. An overused but very true phrase, adapted from a 1911 article (Brisbane, 1911), is that a picture is worth a thousand words. Collier (1967, p.170) argues that, "it is this independent authority of the visual data that makes photographs, film, and video so valuable in behavioural research." One can get similar results using verbal interviews, but photographs can provide the same information instantaneously and effectively (Collier, 1967, p.105). Rather than comparing interviews to visuals, Pink (2007, P.119) attempts to explore the relationship between both methods and in her own words "in ethnography images are as inevitable as sounds, smells, textures and tastes, words or any other aspect of culture and society" (2007, p. 21). At the same time, Pink (2007, pp. 177-179) offers a more critical and nuanced idea of photographs as recording partial truths. Furthermore, like other visual representations, photographs can be used to capture simulations or constructed realities.

Photography proved to be an asset in providing a fine-grained record of facial expressions, body posture, gesture and also the apps used. This was the main reason why I decided also to take photos.

Subsequently, I created a grid (Table 2) to organise the relevant multimodal transcriptions. In the drafting of this grid I was mindful of Roberta Taylor's study (2014) and the literature that focuses on affordances (e.g. Conole & Dyke, 2004).

Table 2: Multimodal transcription

Time-frame	Brief Description	Vocalisation/ Speech	Movement, Gesture, Facial expression	Intra-action	Ability to identify and articulate information needs	Expressing themselves creatively through digital media and technologies.	Collaborating with others in learning.	Ability to care for tablets	Ability to switch on/ off tablets and access apps

In view of the criteria listed in Table 2 above, I tried to capture the right moments by means of photography. Although I am not a professional photographer, as an e-Learning support teacher I always believed that photography could be a wonderful educational resource and hence, having some basic skills, would surely be an asset. After a photographic course for teachers, which I organized at the e-Learning Department, I became aware of the photograph's capability to reproduce the image in front of the camera's lens and to serve as evidence of past situations and realities. Basil (2011, p.251) states that educational research photography, "allows us to record behaviour in its situational context; it also allows for reflection, the use of informants, coding, and allows us to illustrate the situation or behaviour to others". As Clark observes (2005, p.327), "Working with the visual language of participants' photographs provided a 'safe space' in which opinions could be expressed and views explored." Pink (2007, p.28) postulates that these "visual explorations produce useful data for understanding how people experience their social and material environments".

A researcher should not necessarily be a good photographer, although in my opinion this helps. Modern digital cameras facilitated a lot of our work with automatic settings such as fast shutter speed, which would be useful to capture someone moving or running. Automatic settings are available also should a photo need to be captured at night or when there is insufficient light. An important skill I gained from experience is capturing the experience of children, at eye level, rather than from an adult's standing view.

3.8.3 Visual Methods

Visual methods were influential to my approach because of the age of children that I observed. Clark and Moss (2001, 12) describe their approach as employing tools which support young children's meaning-making and are more dependent on visuals rather than on the spoken word. This was important to avoid technical jargon and vague terminology with children. It was assumed that children would find it difficult to describe the educational benefits of tablets. The methods employed, therefore, enabled children to live the experience rather than recall and share with a spoken word or drawing and enabled me to gain a deeper insight into the data gathered.

As stated earlier in this chapter, I was mindful of Clark's visual participatory approach (2011) which offers a mechanism to share data and understanding of the data captured between different researchers. The Mosaic approach was described by Clark (2011, p.323) as a "set of methods to gather and reflect on the views and experiences of young children (under five-years-old)" and in this sense it proved to be a wonderful strategy when it came to obtaining information, although it is acknowledged that the research was not fully participatory in nature, as discussed previously. The teacher's input, whether through the lessons delivered or various informal discussions, was equally important since my approach, just as the mosaic approach, focused on the generation of knowledge rather than "on age or stage of development" (Clark, 2011, p.328). Meanwhile, I would like to stress the point that this methodology was not simply about adopting more 'child-friendly' techniques and methods. Neither was it an attempt to discard current methods in order to provide a new route which would be tailored for young children. Rather, I am proposing what Mannion (2007, p.416) described as "intergenerational listening" where I can gather data from adult participants (in my case, teachers) and also young children in a smooth process. As Clark (2011, p.328) posits, "the Mosaic approach may offer

a set of research tools which could, at times, facilitate this process particularly for those (whether adults or children) who are least powerful and least visible."

As suggested, the methods included in this approach were not restricted to observations using my own camera. It also included children taking photos themselves and of their settings; choosing which lessons they remembered well, and then engaging in informal discussions about them. The films recorded and photos taken by the children were crucial. Although one may argue that children may have filmed only those instances they deemed interesting to adults, this in itself was still valuable information, for it also implied that children may have grasped the most important aspects of the lesson. I felt naturally inclined to use the photos taken by the children so that eventually, they could provide more feedback about which teaching strategies were most effective.

After completing my observations, I organised a feedback session with students. Similar to Clark's (2011) "likes and dislikes" photos, I created an interactive whiteboard flipchart where children could indicate which lessons they remembered most, and which ones they didn't remember at all. The children's own photographs were used in my feedback session. Creating the flipchart myself, however, restricted the children's input, unlike Clark's method which allowed the creation of photobooks by children. This self-criticism allows me to reflect more about the effectiveness of technologies with young children in that sometimes paper, colours and glue may do the job perfectly well.

3.9 Schedule of visits

I filmed 18 lessons when tablets were being used and was present during the lessons. Since I

had to be present during this research, in addition to the videos, as mentioned before, I kept a reflective journal, where I kept record of my observations and informal interviews with teachers and sometimes students. These notes, together with the videos filmed by the students themselves, offered me a deeper insight into the data gathered in my reflective journal. The following table gives a summary of my visits to St John's school and the videos and photos collected.

Table 3: Summary of my visits

Log No	Date	Teacher	Lesson Objectives	Overview of sessions	Types of data collected	Video clips	Video clips by children	Photos	Photos by children	Screenshots
Mtg 1	**26th February**	Head of School / Both teachers			Notes were taken from interviews					
Mtg 2	**26th February**	Ms Mandy			Notes were taken from interview, 14 photographs taken by the researcher			14		
Ob 1	**3rd March**	Ms Yosanne	ch sound	Part 1 (tablets were not used): a) Children sang a song shown on Interactive whiteboard. b) They did a picture match using interactive whiteboard using http://www.readwritethink.org/files/resources/interactives/picturematch/	Observation notes completed, 2 videos recorded by researcher, 2 videos recorded by children, 4 photographs taken by researcher, 14 photographs taken by children	Ob1 3-3-2016 Ms Y n1maincamera; Ob1 3-3-2016 MsY n2 maincamera	Ob1 3-3-2016 MsY chidren class1; Ob1 3-3-2016 MsY chidren class2;	4	14	
				Part 2 (tablets were used). a) Children moved to computer room. I was struck by hte informal setting; children sitting on cushions.	Observation notes completed, 2 videos recorded by researcher, 3 videos recorded by children	WIN_20160303_11_01_37_Pro.mp4; WIN_20160303_11_01_53_Pro.mp4	Ob1 3-3-2016 MsY chidren1; Ob1 3-3-2016 MsY chidren2; Ob1 3-3-2016 MsY chidren3			

				b) In pairs children took pictures of objects using tablets. Activity could not be done without tablets						
Ob 2	**3rd March**	Ms Roberta	Sound names	a) In the computer room, children used Time2Read app. b) Children had to enter their names and the app addressed them with their own names c) Autonomous Learning: Teacher told me she was observing all the time. d) App consiisted of 3 different islands	Observation notes completed, 1 video recorded by researcher, 8 videos recorded by children, 46 photographs taken by researcher, 55 photographs taken by children, 3 screenshots taken by researcher	Ob2 3-3-2016 MsR maincamera (16: 18)	Ob2 3-3-2016 MsR children1; Ob2 3-3-2016 MsR children2 T; Ob2 3-3-2016 MsR children3; Ob2 3-3-2016 MsR children4; Ob2 3-3-2016 MsR children5; Ob2 3-3-2016 MsR children6; Ob2 3-3-2016 MsR children7; Ob2 3-3-2016 MsR children8	46	55	3
Ob 3	**9th March**	Ms Yosanne	Phonics	Part 1 (in class): (a) Children sang alphabet song. (b) Teacher read words and students choose the right word	Observation notes completed, 4 videos recorded by researcher, 8 videos recorded by children, 13 photographs taken by researcher, 23 photographs taken by children, 6 screenshots taken by researcher	Ob3 9-3-2016 MsYmaincamera 1; Ob3 9-3-2016 MsYmaincamera 2; Ob3 9-3-2016 MsYmaincamera 3; Ob3 9-3-2016 MsYmaincamera 4	Ob3 9-3-2016 MsY children 1.mp4; Ob3 9-3-2016 MsY children 2.mp4; Ob3 9-3-2016 MsY children 3.mp4; Ob3 9-3-2016 MsY children 4.mp4; Ob3 9-3-2016 MsY children 5.mp4; Ob3 9-3-2016 MsY children 6.mp4; Ob3 9-3-2016 MsY children 7.mp4; Ob3 9-3-2016 MsY children 8.mp4	13	23	6
				Part 2 (in computer room) (a) Children used Olly and Icky Phonics Pumpkin. (b) They were able to manage on their own.	Observation notes completed, 5 videos recorded by researcher, 9 photographs taken by researcher, 10	WIN_20160309_09_22_29_Pro; Ob3 9-3-2016 MsY ipad 1; Ob3 9-3-2016 MsY ipad 2; Ob3 9-3-2016 MsY ipad 3		9	10	

				Quite confident using tablet (c) Teacher told me that during parents' day many parents also noted that at home tablets were used to access videos and also to play (Digital literacy competences) (d) I noted that a lot of learning through play was happening	photographs taken by children	(blank); Ob3 9-3-2016 MsY ipad 4 (blank)				
Ob 4	**9th March**	Ms Roberta	Letters revision	(a) Children sang alphabet song. I noticed how bothteachers collaborate with each other. Ms Roberta told me that collaboration was extremely important and new initatives such as using tablets enable them to collaborate more (b) Children were provided with non-digital ABC letters. We discussed the importance of using both digital and non-digital tools. Ms Roberta told me that children have to feel the letters. (c) Tablets were provided to children and Preschool Kindergarten app was used. Lot of self-	Observation notes completed, 10 videos recorded by researcher, 61 photographs taken by researcher	Ob4 9-3-2016 MsRmaincamera 1; Ob4 9-3-2016 MsRmaincamera 2; Ob4 9-3-2016 MsRmaincamera 3; Ob4 9-3-2016 MsRmaincamera 4; Ob4 9-3-2016 MsRmaincamera 5; Ob4 9-3-2016 MsRmaincamera 6; Ob4 9-3-2016 MsRmaincamera 7; Ob4 9-3-2016 MsRmaincamera 8; WIN_20160309_12_02_12_Pro; WIN_20160309_12_23_07_Pro		61		

				learning took place Joining the dots activities etc proved the affordances of the touch-screen facility in learning.						
Ob 4B	**16th March**	Ms Yosanne	Healthy Eating	After listening to a talk, children used app Żaqqinu jagħżel x'jiekol and did a "matching" activity using Educrations.	Observation notes completed					
Ob 5	**13th April**	Ms Yosanne	"ġ" in Maltese.	Part 1 (in classroom) (a)Since this was a Maltese lesson students were introduced to "Orsinu: (name is a diminutive of a small bear) soft toy. They rehearsed alphabet in Maltese (b) Find letter. Students learnt the sequence of letter. Interesting ġ of ġiraffa and giraffes have dots (c) reading words with double letters in the middle e.g. sewwa, sodda.	Observation notes completed, 9 videos recorded by researcher, 17 photographs taken by researcher	Ob5 13-4-2016 MsY video 1a; Ob5 13-4-2016 MsY video 1b; Ob5 13-4-2016 MsY video 2; Ob5 13-4-2016 MsY video 3; Ob5 13-4-2016 MsY video 4; Ob5 13-4-2016 MsY video 5; Ob5 13-4-2016 MsY video 6; Ob5 13-4-2016 MsY video 7; Ob5 13-4-2016 MsY video 8		17		
				Part 2 (in tablets room) (a) Children used a pre-prepared activity using quizlet (i) Lots of self-testing took place (iii) Activity was very engaging.	Observation notes completed, 1 video recorded by researcher,	WIN_20160413_11_05_32_Pro				
Ob 6	**13th April**	Ms Roberta	ee sound	a) Children sang "Phonics" song (https://www.youtube.com/watch?v=BELlZKpi1Zs	Observation notes completed, 7 videos recorded by researcher, 21 photographs taken by researcher	Ob6 13-4-2016 MsR video 1; Ob6 13-4-2016 MsR video 2; Ob6 13-4-2016 MsR video 3; Ob6 13-4-2016 MsR video 4; Ob6 13-4-2016 MsR		21		

				). Another soft toy was also used: "Mr Koala" (b) Children read letters on Interactive whiteboard: ay words reading. Whiteboard used passively to show pictures (d) I liked te way Mr Koala was used: "I put my glasses on so I can see"		video 5; Ob6 13-4-2016 MsR video 6; WIN_20160413_12_02 _46_Pro				
Ob 6b	**20th April**	Ms Yosanne	Healthy eating	Żaqqinu jagħżel x'jiekol Matching activity using Educreations	Observation notes completed					6
Ob 7	**29th April**	Ms Roberta	Parts of Sentence	Before lesson children changed the date of the HSBC calendar. This felt calendar creates a sense of touch (b) Rehearsing letters / drilling (c) video centopied (https://www.youtube.com/watch?v=sncdNk4yaA8); (c) Parts of sentence Introduction/body/conclusion ; part 2: a) Teacher created digital pictures; students participating ; sentence structure (il-libsa twila); Use of clapping. Students learning capital letters. What makes a sentence (starting with capital letter, ending with fullstop). Part 3. Static picture of article on whiteboard . At the same tie studnets trying to find a word. Part 4) Techer used iwb app. Using work book -	Observation notes completed, 7 videos recorded by researcher, 13 photographs taken by researcher, 45 photographs taken by children	Ob7 29-4-2016 MsR video 1; Ob7 29-4-2016 MsR video 2; Ob7 29-4-2016 MsR video 3; Ob7 29-4-2016 MsR video 4; Ob7 29-4-2016 MsR video 5; Ob7 29-4-2016 MsR video 6; Ob7 29-4-2016 MsR video 7		13	45	

				writing at the end of the lesson Part 5: Tablets activity - Naqra Naqra. A) Literacy / Oracy (b) Hear sound and associate with word e.g. P --- pala.						
Ob 8	**29th April**	Ms Yosanne	ow oo	1) Children sang Alphabet song (2) They rehearsed "naughty sounds: e.g. Truck (e) They were introduced to lesson objective: "ow" sound, e.g. cow and "oo" song e.g. moon; Part B (c) Video teaching "igh" sound as in. High, light,. Children wrote sound on mini-whiteboard – a non-digital tool. (d) Children used QR code facility on tablets to discover "secrett" word	Observation notes completed, 3 videos recorded by researcher, 4 photographs taken by researcher	Ob8 29-4-2016 Ms Y video 1; WIN_20160429_11_12_20_Pro; WIN_20160429_11_17_22_Pro		4		
Ob 9	**11th May**	Ms Yosanne	ir sound	Lesson objective was IR sound. In this lesson whiteboard, collage and tablets were used (a) mistakes and the lesson was less time (b) Children usee mini-whiteboard. Teacher explained that she considered haptics better than on a digital device (c) Collage by consuming. The disadvantages were less tangibility and also less sharing because all children worked on their own. teacher. d) Children used "Draw" activity on	Observation notes completed, 19 videos recorded by researcher, 19 photographs taken by researcher	Ob9 11-5-2016 Ms Y video 1; Ob9 11-5-2016 Ms Y video 2; Ob9 11-5-2016 Ms Y video 3; Ob9 11-5-2016 Ms Y video 4; Ob9 11-5-2016 Ms Y video 5; Ob9 11-5-2016 Ms Y video 6; Ob9 11-5-2016 Ms Y video 7; Ob9 11-5-2016 Ms Y video 8; Ob9 11-5-2016 Ms Y video 9; Ob9 11-5-2016 Ms Y video 10		19		

				tablets to draw Teacher explained that amongst the advantages of using tablets were that children felt more confident of not doing						
Ob 10	**11th May**	Ms Roberta	Revision	Revision Lesson. Children used "Twinkle Phonics Phase three" in computer room.	Observation notes completed, 4 videos recorded by researcher, 9 photographs taken by researcher	Ob10 11-5-2016 Ms R video 1; Ob10 11-5-2016 Ms R video 2; Ob10 11-5-2016 Ms R video 3; Ob10 11-5-2016 Ms R video 4		9		
Ob 11	**20th May**	Ms Yosanne	Numbers in Maltese	Children used Educreations on tablets to take photo of numbers The pupils were firstly required to understand the number in Maltese, then select it, add it to 'Educreations' using the camera facility and finally pick up the right amount of balls in accordance with the given number	Observation notes completed, 9 videos recorded by researcher, 2 videos recorded by children, 27 photographs taken by researcher, 34 photographs taken by children	Ob11 20-5-2016 Ms Y video 1; Ob11 20-5-2016 Ms Y video 2; Ob11 20-5-2016 Ms Y video 3; Ob11 20-5-2016 Ms Y video 4; Ob11 20-5-2016 Ms Y video 5; Ob11 20-5-2016 Ms Y video 6; Ob11 20-5-2016 Ms Y video 7; Ob11 20-5-2016 Ms Y video 8; Ob11 20-5-2016 Ms Y video 9	Ob11 20-5-2016 Ms Y video child 1; Ob11 20-5-2016 Ms Y video child 2	27	34	
Ob 11b	**20th May**	Ms Mandy	Coding	Children used bee-bots. Tablets were not used. They learnt directional language and commands. Computational thinking learning outcomes were reached.	Observation notes completed, 6 photographs taken by researcher, 12 screenshots taken by researcher			6		12
Ob 12	**25th May**	Ms Yosanne	Colours in Maltese	(a) Children used the digital media player to display what they draw on tablets to the classroom large screen. The app *Drawing Desk: Draw & Paint Art'* was used. A child drew the	Observation notes completed, 12 videos recorded by researcher, 10 photographs taken by researcher	Ob12 25-5-2016 Ms Y video 1; Ob12 25-5-2016 Ms Y video 2; Ob12 25-5-2016 Ms Y video 3; Ob12 25-5-2016 Ms Y video 4; Ob12 25-5-2016 Ms Y video 5; Ob12 25-5-2016 Ms Y video 6; Ob12 25-5-2016 Ms Y		10		

				colour whilst the others had to write the word. (b) Words used were blu, isfar, vjola, aħmar, roża, abjad, iswed, mara, tifel (c) Reading. (tablets were not used but teacher explained that she wanted to explore more tools like easy-view.)		video 7; Ob12 25-5-2016 Ms Y video 8; Ob12 25-5-2016 Ms Y video 9; Ob12 25-5-2016 Ms Y video 10; Ob12 25-5-2016 Ms Y video 11; Ob12 25-5-2016 Ms Y video 12				
Ob 13	**25th May**	Ms Roberta		Part 1 (in class). Teacher used interactive whiteboard. They also used magnetic letters and small magnetic boards. Teacher discussed the advantages of these non-digital devices. Children wrote on their own boards the new word “here”. Tablets were a motivating factor for good behaviour as teacher used the computer room as an incentive for good behaviour: "Jekk ma tobdux ma mmorux" (If you don’t obey we won’t go [to computer rom]) . They played the “here” and “there” game where they have to follow	Observation notes completed, 8 videos recorded by researcher, 21 photographs taken by researcher	Ob 13 25-5-2016 Ms R 1; Ob 13 25-5-2016 Ms R 2; Ob 13 25-5-2016 Ms R 3; Ob 13 25-5-2016 Ms R 4; Ob 13 25-5-2016 Ms R 5; Ob 13 25-5-2016 Ms R 6; Ob 13 25-5-2016 Ms R 7; Ob 13 25-5-2016 Ms R 8		21		

				instructions, either "come here" or "go there". Part 2 (in computer room): Children used "Tricky words". Lots of autonomous learning took place through play. They learnt new sounds.						
Ob 14	**1st June**	Ms Yosanne	Tricky words	Part 1 (in class): Children sang phonics song. They wrote on interactive whiteboard. Teacher explained the advantages of having a large space over tablets' small screen, for example. Children came out of their places to write new word "come" and "go". They did a "come and go" activity where they had either come or go. I noted the non-linearity of the interactive whiteboard as opposed to their normal text-books. (d) new word some. write it on their mini whiteboards (e) Teacher wrote instructions on iwb) PART B. Tablets. Teacher felt confident with inquiry based learning. preferred a whole classroom approach. Used trick words	Observation notes completed, 7 videos recorded by researcher, 14 photographs taken by researcher .	Ob 14 1-6-2016 Ms Y 1; Ob 14 1-6-2016 Ms Y 2; Ob 14 1-6-2016 Ms Y 3; Ob 14 1-6-2016 Ms Y 4; Ob 14 1-6-2016 Ms Y 5; Ob 14 1-6-2016 Ms Y 6; Ob 14 1-6-2016 Ms Y 7		14		

Ob 15	**1st June**	Ms Roberta		'Zaption' used to add questions to a video created by Ms Mandy using GoAnimate. Ms Mandy created an animated video about Maltese vowels, using 'GoAnimate', and uploaded it on YouTube. Subsequently, Ms Roberta created an interactive video lesson by adding questions and text to the existing video, using 'Zaption'	Observation notes completed, 11 videos recorded by researcher, 2 photographs taken by researcher	Ob 15 1-6-2016 Ms R 1; Ob 15 1-6-2016 Ms R 2; Ob 15 1-6-2016 Ms R 3; Ob 15 1-6-2016 Ms R 4; Ob 15 1-6-2016 Ms R 5; Ob 15 1-6-2016 Ms R 6; Ob 15 1-6-2016 Ms R 7; Ob 15 1-6-2016 Ms R 8; Ob 15 1-6-2016 Ms R 9; Ob 15 1-6-2016 Ms R 10; Ob 15 1-6-2016 Ms R 11		2		
Ob 16	**15th June**	Ms Roberta	Finding missing consonant	Children used an off-the-shelf app '*Mel's Phonics CVC lite*', which allowed children to be more involved in the learning experience and participate more actively. They practiced blended sounds. They wrote letters and had to find missing consonants.	Observation notes completed, 5 videos recorded by researcher, 25 photographs taken by researcher	Ob15 15-6-2016 MsR 1; Ob15 15-6-2016 MsR 2; Ob15 15-6-2016 MsR 3; Ob15 15-6-2016 MsR 4; Ob15 15-6-2016 MsR 5		25		
FB 1	**16th June**	Ms Roberta	Feedback	I created an interactive whiteboard flipchart where children could indicate which lessons they remembered most, and which ones they didn't remember at all. Those which they could recall by dragging them in the box. The children's own photographs were used in my feedback session. "Tricky words" was unanimously chosen as	Observation notes completed, 3 videos recorded by researcher	MVI_8239.MOV; MVI_8240.MOV; MVI_8241.MOV				

				one of the most favourite lessons together with Phonics Pumpkin. Children also recalled the Zaption app.						
FB 2	**17th June**	Ms Yosanne	Feedback	I created another interactive whiteboard flipchart similar to FB! And children gave me their own feedback by telling me which lessons they remembered most. Children remembered quite well the lessons where they drew on tablets what they were told e.g. girl, the colours lesson, the Maltese language lesson on Quizlet as well as phonics pumpkin. On the other hand only 1 recalled the lesson where QR codes were used.	Observation notes completed, 4 videos recorded by researcher .	MVI_8181.MOV; MVI_8182.MOV; MVI_8183.MOV; MVI_8184.MOV				

Int 1	**16th June**	Ms Roberta			Transcript from interview					
Int 2	**17th June**	Ms Yosanne			Transcript from interview					
Int 3	**16th June**	Ms Mandy			Transcript from interview					
					24 observation notes, 41 minutes of recorded audio interviews, 3 transcripts from interiews, 2 notes from meetings	**222 observation videos recorded by researcher**	**23 video clips recorded by children**	**335 photos taken by resear-cher**	**181 photos taken by children**	**27 screenshots taken by researcher**

The naming of the videos works as follows: [Observation][Date][Teacher][video number] i.e. Ob8 29-4-2016 Ms Y video 1.

As outlined in Table 3, the data comprised of the following: 24 observation notes on the 2lessons observed, transcripts from 3 interviews with teachers (41 minutes of recorded audio interviews), 117 video clips and 5 whole lesson videos, 23 video clips taken by children, 335 photographs,181 photographs taken by children and 27 screenshots. During last two lessons I carried out a "feedback session" with each class and I coded these as follows: FB. Further to this feedback with children I also conducted semi-structured interviews with the two participant teachers and also with the e-Learning support teacher. I audio-recorded these informal interviews and transcribed them (Appendix VIII). Prior to these, I had also visited the school for preparation meetings with the Head of School, teachers, parents and children.

When videoing, I captured parts of the lessons where language learning was taking place and the teacher was making extensive use of tablets and also digital and non-digital tools. This enabled me to have a better insight of the pedagogical affordances of tablets. There are six instances where I felt the need to record the whole lessons (those filenames start with WIN), as tablets were being used during the whole lesson.

3.10 Approaches to data analysis

Stenhouse (1981, p.103) defines research as a "systematic self-critical inquiry". Educational researchers can therefore "engage in educational activities to achieve their purposes in a more systematic and self-critical way" (Carr, 2007, p. 275). This section presents and explores the theoretical framework that underpinned the analysis of the data obtained during the study. Here, I discuss the processes of analysis and how I developed the codes, concepts, categories

and the connections between them. Miles & Huberman (1994, p.56) describe codes as "tags or labels for assigning units of meaning to the descriptive or inferential information compiled during the study". ". In the following section, I provide an overview of how each type of data was coded.

Observation notes and notes from interviews

I began by analysing the observation notes and notes from interviews. The development of the code structure was an iterative and lengthy process, but it enabled me to pull out and retrieve the chunks (Miles & Huberman, 1994), cluster the segments and draw conclusions. Hammond and Wellington (2013, p.23) state that, "in generating codes, the researcher has a choice between top-down (deductive) or bottom-up (inductive) approaches".

The affordances and challenges were retrieved from literature. Hammond and Wellington (2013) define the approach of retrieving codes from literature as a deductive one. They argue that "deductive analysis is often described as a step-by-step approach – data can be sorted, organised, and conclusions reached" (p.10). The key themes which emerged from the literature were portability, touch screen functionality, motivation, cost of tablets, the potentiality to create multi-modal texts and also collaboration. These benefits can be afforded by educators to provide assessment for learning. Besides, lessons can be tailored in accordance with each pupil's learning style and ability. However, many authors also note that significant challenges are hindering widespread effective implementation and some of the themes can be considered as both pros and cons. Another prevalent theme, in fact, was that most educators consider the smooth and effective integration of tablets as a challenge. I highlighted these codes related to the literature on Mendeley and papers and created nodes. The endeavour of my study was to

evaluate these themes in a real classroom. As Hsieh & Shannon (2005, p.1281) explained, “the goal of a directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory”.

However, during my analysis, new insights kept coming up. As Hsieh & Shannon (2005, p.1279) state, sometimes researchers also, “immerse themselves in the data to allow new insights to emerge”. I decided to also use the inductive approach, which is concerned with the generation of new theory emerging from the data. Analysis in this study was ongoing, as I constantly reflected upon the classroom interactions and the learning processes. This enabled me to draw comparisons and explore contrasts vis-à-vis the theory. The inductive themes that emerged from this process were:

(a) Children were very looking forward for learning through tablets

(b) Tablets enabled children to roam about and at the same time interface with the main screen.

(c) Using touch screens children did not require anything else. No use of keyboard, mice etc., and the focus was on language learning.

(d) Use of images enabled children to understand what they are reading and the use of sound ensured that children listen to the correct pronouncation. This was even more important since none of the teachers was native English.

(e) Use of open-ended apps facilitated use of Maltese language.

(f) Teachers were struggling to integrate tablets in their teaching and learning in a meaningful way.

(g) Choosing apps which would reach their learning outcomes was a painstaking task for teachers.

(h) Teachers were very wary that tablets might be dropped and damaged.

Video data

After I coded the data, I started to analyse the video clips. These helped me to observe some details which had not been noticed by myself as a viewer. Video analysis is very time-consuming and I focused on short segments of my data at a micro-analytical level. The short segments were chosen because they related to the research questions directly. There were some video clips where the participants made extensive use of tablets and I decided to transcribe them entirely: Ob1 3-3-2016 MsY children.docx; Ob1 3-3-2016 MsY n2 maincamera.docx; Ob2 3-3-2016 MsR chidren2.docx; Ob2 3-3-2016 MsR maincamera.docx; Ob2 3-3-2016 MsR chidren2.docx; Ob2 3-3-2016 MsR maincamera.docx; Ob5 13-4-2016 MsY video 2.docx; Ob5 13-4-2016 MsY video 3.docx; Ob5 13-4-2016 MsY video 4.docx; Ob5 13-4-2016 MsY video 5.docx; Ob5 13-4-2016 MsY video 6.docx; Ob5 13-4-2016 MsY video 7.docx; Ob5 13-4-2016 MsY video8.docx; Ob5 13-4-2016 MsY video 9.docx; Ob 13 25-5-2016 Ms R 1.docx; Ob 13 25-5-2016 Ms R 2.docx; Ob 13 25-5-2016 Ms R 3.docx; Ob 13 25-5-2016 Ms R 4.docx; Ob 13 25-5-2016 Ms R 5.docx; Ob 13 25-5-2016 Ms R 6.docx; Ob 13 25-5-2016 Ms R 7.docx; Ob 13 25-5-2016 Ms R 8.docx; Ob15 15-6-2016 MsR 1.docx; Ob15 15-6-2016 MsR 2.docx; Ob15 15-6-2016 MsR 3.docx. The video data were analysed in relation to the themes that emerged from the process undertaken with the observation and interview notes. New inductive themes emerged from this process, which were:

(a) Children's happy faces confirm that they were quite motivated and significantly delighted with learning through play.

(b) Different images from the same lesson indicate that some form of autonomous learning was taking place.

(c) Touch screen facility was intiuitive for 7 years old children and enabled them to join the dots, write numbers just the same they do on a paper

(d) Use of sounds enabled repetition which reinforced and intensified heir vocabulary and word recognition in a fun way.

(e) Videos enabled me to appreciate more the use of digital, mainly tablets, and non-digital tools such as the clacking noise of plastics together.

(f) A combination of closed and open-ended apps were used and worked perfectly well for both teachers.

These codes were then applied to the observation notes and interview transcripts.

Photographs and screenshots

As in the case of videos photographs were analysed independently from observation notes and this allowed me to combine the visual and the textual narratives. Still images enabled me more to analyse children pointing to objects, "intra-action" with tablts, and smiles on children's faces. Photographs were also a point of reference and documentation of the apps used as well as the type of activities which took place. The results of the analysis indicated that for some of the themese that emerged were found in both the visual and textual narratives.

The main language used in the classroom was Maltese but with extensive use of English language by the teachers. Some of the observations together with the interviews were also translated. Translation of quotes posed several challenges because when translation is required, language differences play a significant role (Nes, Abma, Jonsson, & Deeg, 2010). Syllables, for example, have a significant role in the Maltese language. Words such as 'kaxxa (box)' in Maltese was important for the stress on the middle double consonant which sounds like 'sh'. In the excerpts of my findings and analysis chapter (Chapter 4) I left the original word in

Maltese. Although I had in mind what to look for, new data kept emerging, as explained in the next chapter. Eventually, going back and forth across the datasets, as outlined above, the entire data set was coded, and a code map was devised (Appendix 6).

3.11 Chapter summary

In this chapter I explained why I adopted an interpretivist approach, since it enabled me to understand the lived reality of tablet usability in a real classroom from my own perspective. A quantitative research study could not have suited this investigation because despite the 'objectivity' of the quantitative approach, it could not have shown the meanings, experiences and interactions taking place in the classroom. It was for this reason that by the 1970's there was a shift to qualitative research, especially due to "unresolved problems in 'positivist' research" (Hammersley, 1997, p. 144). Epistemologically, I moved away from the traditional approach to data and adopted a constructivist methodology that entailed pragmatism.

I looked for ground-breaking educators who were willing to experiment with tablets, but from the beginning explored several concerns which are well-founded by literature. Lessons were filmed either as a whole or in part, depending on whether tablets were being used, as well as any constraints due to the camera position. However, I also filmed when teachers were using other learning tools in order to expose the possible constraints of using tablets and their pedagogical limitations. Inspired by the mosaic approach (Clark, 2011), I extended the research access by providing children with the camera in order to create a shift in perspective. Furthermore, during my feedback sessions I sought to discover which of those pictures they remembered most. This put me in a better position to deduce which apps and approaches were more effective. Ultimately, photos and videos allowed for a more in-depth analysis because

they captured aspects and details that I had not noticed despite my presence in the classroom.

In this chapter I also discussed the approach towards analysis wherein I adopted a combination of deducted and inductive strategies. The findings, with which I aim to contribute towards this emerging area, will be discussed in detail throughout the next chapter.

Chapter 4:
Presentation of findings and analysis

4.1 Introduction

As described in Chapter 3, the findings presented in this thesis stem from the data collected in a state school over a five-month period. By visiting two classrooms I could observe two different teachers in order to gain insight into different ways teachers embraced tablets in their lessons.

The first section of the chapter focuses on the benefits and challenges of tablets utilised in two small classroom environments, where I explored how tablet use was significant in providing rich learning opportunities for students. I did not have access to the literacy report written by teachers at the end of the scholastic year since this comprised personal details of children and access to third party entities and other people who had not given their consent to be included in this study. However, during my observations I could see the children learning various skills and reach a multitude of literacy levels. The apps helped them listen to the sounds of the letters, match them with the corresponding alphabet and use letter-sound knowledge to read words by blending sounds together. Furthermore, children mastered a number of competences such as adding pictures to open-ended apps. Despite their young age, these digital literacy competences were crucial so that eventually, they would be able to annotate pictures and create digital stories. Therefore, whilst this study did not measure the extent to which the tablet use impacted on language learning; observations indicated that rich episodes of learning occurred. Instead, my study focused on identifying the nature of the opportunities and challenges presented in the use of tablets in the classroom.

4.2 Benefits and challenges of tablets in the classroom

In this chapter I present the tablet experience in terms of pros and cons to teaching and learning. I use videos filmed by students to inform this analysis, but I always interpret these experiences from my own perspective.

The structure adopted for this chapter enables the addressing of the two research questions in two main sections by identifying the affordances and challenges as shown in table 4 below:

Table 4: Benefits and challenges of tablets in the classroom

Benefits of tablets
Tablets stimulate children's motivation
Tablets as portable devices
Touch screen facility
Tablets as multimodal literacy tools
Tablets create multi-modal texts
Open-ended apps facilitated use of Maltese language
Tablets facilitate personalised learning
Tablets facilitate collaboration
Tablet usage to fight digital and social inequalities
Challenges of Tablets
Integration of tablets as a new technology
Choosing apps
Portability
Tablets may impose a financial burden on our education system
Tablets alone will not solve literacy and other educational problems

This table does not represent clear-cut categories, and there are a number of overlaps between them. However, it did serve as a framework, which I adopted in my analysis and which is discussed in the following sections.

4.3 Benefits of tablets

4.3.1 Tablets stimulate children's motivation

Hutchby (2001, p.447) described affordances as the properties of technologies that show "the possibilities that they offer for action and carry both strengths and shortcomings for users to engage in." Several authors (e.g. Johnson, Bruner Ii, & Kumar, 2006, p. 41) define affordances in relation to their use and the users' perception of their functionality. This was a revealing distinction because in my profession, affordances are understood in terms of their usability, whereas there is no awareness of the phenomenological aspect. Neumann & Neumann (2014) describe tablets as "interactive multimedia displays that stimulate visual, auditory, tactile, and kinaesthetic sensory systems and respond to a child's input with instant feedback". These affordances constitute the subject matter discussed and explored in this chapter.

The enthusiasm shown by the children whenever tablets were being used defies description. Unfortunately, since the children were relatively young, some functionalities, such as the sticky note function, could not be appreciated, unlike the participants in Hutchinson, Beschorger, & Schmidt-Crawford's study (2012) who described how these notes helped them remember what they read. At the same time, in congruence with my study, Hutchinson et al., (2012) describe how much the children in their observations "liked" and "enjoyed" several activities using tablets. This was also the case in my data.

The videos and photos I took helped me avoid what Mack et al., (2015) noted, namely that the researcher in participatory research either has to be very disciplined in the reflective diary, or rely on their memory. The videos enabled me to gain a deeper understanding of the process. As described by Johnson and Kontovourki (2016, p.9), "emotions, sign transformations, and

responses are situated in time and place with material consequences for the ways identities are lived and felt". The expressions on the children's faces, for instance, revealed their satisfaction when using tablets, and achieved results. For example, one of the pupils, John, clapped with joy during Observation 7 (Ob7 29-4-2016 MsR video 6), when he got his answers right. Regrettably, ethical constraints do not allow me to share photos of children's faces, which would have shown how attentive they were during lessons. This research does not attempt to verify whether the excitement of using tablets will last, because to the participants of my study, tablets constitute a ground-breaking phenomenon. Nevertheless, this research does confirm that tablets also have a 'wow' factor, which was clearly evident in the positive emotions elicited in children and their exclamatory behaviour.

The children's sense of satisfaction when they discovered the possibility of taking pictures and seeing their own product was very evident during the first observation:

> ***Ms Yosanne****: So, take a picture of this, take a picture of that one under the blue, go down, go down, sit down and take a picture. Very good, th-th-thermos, what do we have now? What do you have in your pictures?*
>
> ***Patrick****: Wow [00:10:39]*
>
> *(ob1 3-3-2016 MsY n2 maincamera – translated)*

The children's enthusiasm was also evident in Observation 5 (Ob5 13-4-2016 MsY video9 – Translated), when they were proud to show me their work:

> ***Ms Yosanne****: You see how good you are [to girl), you're not showing it to him are you?*
> ***Researcher****: Let me see, let me see.*
> ***Ms Yosanne****: But she pressed next already*
> ***Researcher****: Oh, OK.*
> ***Ms Yosanne:*** *Show him this one now.*

Meanwhile, teachers expressed some concern about the line separating learning from fun since for children, using tablets was like playtime, though in the below excerpt Ms Yosanne suggests that play does not exclude learning and that these can happen simultaneously.

> ***Philip**: Miss are we going to play with the iPad?*
> ***Ms Yosanne**: Yes*
> ***Philip**: Great.*
> ***Researcher**: We learn by using the iPad.*
> ***Philip**: Giggle*
> ***Ms Yosanne**: We learn by using it, we don't use the iPad just to play with it. [00:03:23]*
> *(Ob5 13-4-2016 MsY video 2 – Translated)*

Whilst tablets are not there just for playing on, there is much research which shows that children learn through play (Shukla, 2014). Tablets are there to enable and empower learning, but creating this atmosphere of excitement is also important. Moore (2017, p.374) recommends these "fun" activities using tablets so that, "learners both young and old [can]socially interact in discovery-based learning through play".

During her interview, Ms Mandy, the e-Learning support teacher, reaffirmed the potential of tablets' affordances to increase students' motivation while serving as useful learning tools in drill and repetition, which she considers as very important to literacy learning. She argued that:

> *... children need the teaching methods currently in place with a lot of repetition because there is the need of repetition especially when the children are very young. And along with these, to make teaching more attractive, the use of apps as we mentioned before, there are a lot of colourful and animated ones, you have great graphics so the students will remember certain letters, for example, or certain numbers. So, you are reinforcing what you are teaching by using digital tools along with the teaching methods you were already applying.*

Ms Mandy used the word "reinforcing" to indicate that in a way tablets can be used as a 'fun' device in this crucial step in language learning. In the lessons I observed, teachers explored the possibilities of how tablets could be used in a more innovative way to reinforce language learning. When children are engaged in learning, they tend to recall their own work better. Similar to Colliver & Fleer's study, (2016), children in my study understood their own learning.

Ms Yosanne was convinced of the benefits of tablets largely because she could see that students were excited, interested and motivated:

> ***Researcher****: Do you know what I mean? This activity could have easily been done using workbooks and flashcards for example? [00:00:12]*
> ***Ms Yosanne****: We could have done that, but children are more engaged in this way. (Ob5 13-4-2016 MsY video 6 – Translated)*

In this particular lesson, Ms Yosanne used *Quizlet*. *Quizlet* is an open-ended app which allows teachers to create an activity and students to manipulate it. The use of *Quizlet* in this classroom was a demonstration of good practice of tablet-mediated teaching and learning. In most of my observations, tablets were used to complement other non-digital tools rather than replace them, which concurs with reviews of practice. According to Price, Jewitt, & Crescenzi (2015, p.140), "these technologies should be used as a complement to other activities, without lessening a prioritizing of messy, sensory experiences, such as physical painting, at this stage of child development." Ms Yosanne, for instance, found iPads limited compared to singing, and she believed that talking to the children was more effective than screen time, but she felt Ipads enabled her "*to do something different from daily routine*" (Interview Ms Yosanne).

However, there were other instances when the use of tablets was more equivalent to the substitution level in the Substitution, Augmentation, Modification and Redefinition (SAMR)

framework of Puentedura (2009). As an e-learning support teacher at the time of this research, I was fully aware of some potential benefits of tablets, but I tried not to take advantage of the privileged position I had as a researcher vis-à-vis the researched (Råheim et al., 2016). This allowed me to obtain information on what teachers consider to be the benefits of tablets, even if, at times, its use seemed rather superficial to me. In Observation 9 (11th May), for example, Ms Yosanne remarked that drawing could have been done using paints on paper, but the tablet afforded painting without the mess paints would have caused and the hassle of cleaning up (see Figure 2). In this case, tablets acted as a mere substitute to drawing on paper but were easier for the teacher to allow in class.

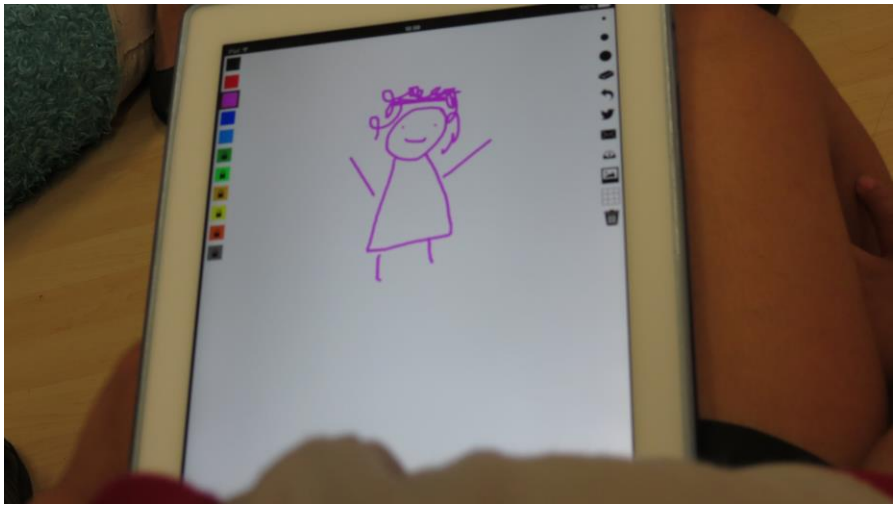

Figure 2: Drawing on tablets

Admittedly, tablets did not provide the tangible experience of painting with paint, but they did enable the students to achieve their learning outcomes in an engaging manner. During her interview, Ms Yosanne, identified colour recognition as one aspect of learning which can be done by means of tablets without the need of having paints.

The children's reactions (e.g. Observation 15 IMG_8055.JPG) clearly indicated that mastering technologies helps provide children with a sense of self-esteem and independence. As stated by Jones et al., (2006, p.253), "…mobile devices seem to give their users a very strong sense of control and ownership, which has been highlighted in research on motivation as a key motivational factor".

Difficulties encountered by children in mastering tablets, and the level of their digital competences are discussed later on in this chapter, but what happened echoes the conclusions reached by Flewitt, Messer, & Kucirkova, (2014, p.296) who noted that in their data that, "children were familiar with touch-screen devices at home, particularly smartphones, whilst 'novice' children were keen to learn and picked it up really well". I can confirm that children grasped technology easily and at no point did the teacher need to deliver long explanations on how to use tablets. Children definitely had to learn how to master new apps and new possibilities such as the QR code, and most did so impressively.

4.3.2 Sense of belonging

From my observations, I deduced that one very important aspect of tablets that stirred motivation was personalisation. I draw again on Rautio, (2014, p.462) who argues that "children's engagement with 'things' is considered intrinsically relevant: as an end in itself." The classrooms were full of "things"[1] with which children could "intra-act", such as the books inside the tent, as shown in Figure 3 and the jigsaw puzzles shown in Figure 4, both photographs taken by children.

[1] "Things" here is used to refer to resources and it is used deliberately to reaffirm the preceding Rautio quotation.

Figure 3: Reading corner

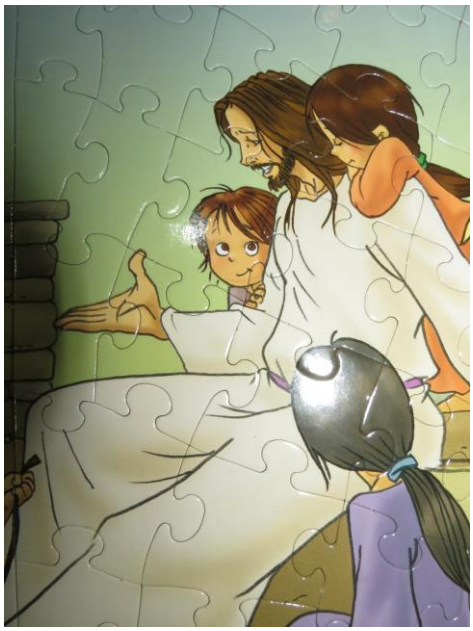

Figure 4: Jigsaw Puzzle book as an example of non-digital learning tool which enabled haptic learning

During my first observations I could immediately relate to Nieuwenhuys (2011, p.411), who stated that plush toys offer, "fascinating opportunities for understanding children's agency". In Observation 1, Ms Yosanne took out the soft toy, Peter, to whom the children could tell the names of sounds. Ms Roberta also had a soft toy, Ms Koala (Observation 6), with whom the children could practise the sound names. Ms Yosanne also had a plush toy for Maltese sound names, called Orsino (See Figure 5). I was told that names were assigned by the children themselves. Allowing students to assign names to their toys yielded fascinating insights into

how children personified their soft toys, gave them names and assigned them personable characteristics.

Figure 5: Orsino held by the teacher

This materiality of children's lives (Nieuwenhuys, 201; Davies, 2014) was also found to be evident in the case of tablets. Tablets belong to the concrete reality of children. They are essential mediators between children and their environment. They enable children to "intra-act" with them and empower them to express themselves. The teachers in my observation emphasised that tablets are for learning, not for play, but 'playing' with tablets as in Observation 5 (Ob5 13-4-2016 MsY video 2 – Translated) takes on a whole new meaning, with an understanding of children's agency.

At the same time, apps provide an environment that is conducive to creating a more personal relationship. A typical example was when students were allowed to input their names and choose an avatar in programs such as *Time2Read*, shown in Figure 6.

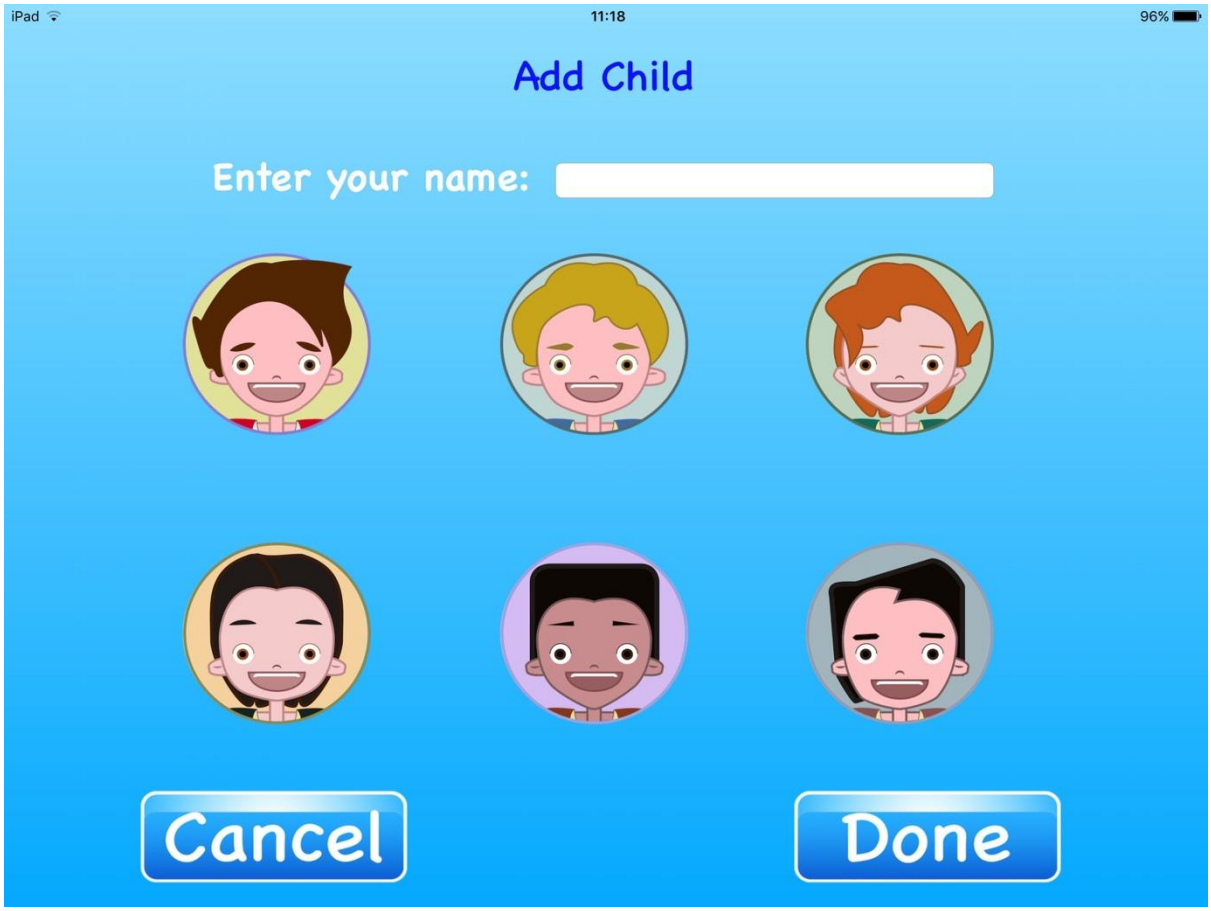

Figure 6: Personalisation

This sense of belonging was also evident despite the fact that the tablets were school property and they could not customise them according to their own wishes. However, they still expressed their wish to personalise their tablets:

> *Pamela: Miss, my cover is white but I'm going to change it next year; I'm going to get a pink one. [00:03:54]*
> *(Ob5 13-4-2016 MsY video 2 – Translated)*

During Observation 9 (Ob9 11-5-2016 Ms Y video 6.MOV), children wanted to choose their favourite colour case.

> *Peter: Blue*
> *Ms Yosanne: Random...*
>
> *Philip: I want it with red*
> *Ms Yosanne: No everyone random*

The above excerpt shows how colour and personalisation are important to children. I noted that children asked me whether they could change their wallpaper image in order to show their allegiance to their hometown football club. This specific means of personalisation, however, was not allowed in school, so teachers could not accede to the children's request. Nevertheless, this shows that tablets are crucial in developing an identity, although the latter is also shaped by several interactions with other environments. In Observation 15 (time 1.31) the child saw a rainbow on screen and instinctively called it rainbow-dash, one of the main characters in 'My Little Pony'. This corroborates Ehret's statement (2016, p.141):

> The continued dematerialization of media compels thinking about new media literacies beyond the glass finality of the screen's surface, engaging not only with material modes on that surface, but with digital presentations of embodied realities in digital bits and bytes.

Burnett, Davies, Merchant, & Rowsell (2014, p.163) also recommend that:

> Rather than aiming for a dispassionate objective literacy curriculum we need to allow students to explore what texts mean to them and share emotional, personal and situated responses.

Unfortunately, none of the lessons in my observations shows examples of how tablets can be used in the understanding and appreciation of our culture and heritage, which can be motiving for children. Tablets, for instance, could be ideal devices in educational treasure hunts linked to culture, which could also strengthen bonds between the children themselves and their environment, and foster collaboration. As Stephen, McPake, Plowman, & Berch-Heyman (2008, p.100) accurately suggest, children are active agents, "in the social and cultural setting of home, contributing both to reproduction of the social world and to societal change through

the new cultures which they create". This also pertains to classrooms, and tablet use can foster the exploration of cultural heritage, thus enhancing motivation (Marsh et al., 2015).

One of the technical features which enabled children gain more ICT confidence was the fact that tablets are keyboard-less. This leads to the next important advantage of tablets, which I noted in my data.

4.3.3 Tablets as portable devices

Flewitt et al., (2014, p.300) state that "the device's mobility enabled students' independence, and their touch screens were more accessible than computer keyboards, which require precise touch and pressure on each key". Since the children I observed were in the first year of their primary school, they still lacked ICT competences, such as using the mouse. However, they found tablets easier to use because they were easier to handle and they allowed direct manipulation. Stephen et al., (2008, p.100) describe tablets as:

> …technologies that are both interactive and communicative, and which are particularly appropriate for preschool age children because they do not rely on using text or a keyboard and are more ergonomically suited for three-to five-year-old children. (p.100)

Unfortunately, in the lessons I observed, tablets were not taken out of the computer room. However, there were cases outside of my datasets, when tablets were even taken out of school, as stated by Ms Mandy, the e-Learning support teacher during her interview:

> *Something that comes to mind is that the older children, for example, needed the tablet for the Malta Junior League; they took the tablet with them to use the 'We Do' and so on. So, they can use the tablet even on an outing; something which is school related. So, the tablet was used outside the Virtual room.*

Nevertheless, I could still notice a difference between the teaching approach in a regular classroom and the way lessons were delivered when tablets were employed. Despite the fact that lessons were delivered in the 'computer room', I could still see benefits of portability. Tablets can provide that unique one-to-one pedagogy which allows for an individualised learning experience. Both open-ended and closed-ended apps allowed for some form of interaction, thus promoting student creativity and boosting their motivation. In the case of the sessions where tablets were used, teachers allowed children to take their own photos, as in Observation 1, or else they used photos to create an interactive activity for students, as in Observation 5.

Tablets allow roaming around freely, without the need for cables, even while connected to a screen. During Observations 14 and 15, the teacher could project the students' work on the screen. Children could produce content on their tablets and show it to the class. Presenting their own work is an important competence and is also envisaged by the European Future Classroom as one of the key zones[2]. From a technical point of view, the fact that no cables were required was an important advantage, which eliminated the risk of risk young pupils damaging cables.

Since tablets can be used anywhere, they also provide an excellent home-school link, which Ms Roberta reaffirmed in her interview:

> *The idea was that the tablet can be carried anywhere. The tablet is not there to use it as a means of play only, but it can be used to learn. So, at school we are showing them various apps and different programmes from which they can learn and maybe while at home, playing with the tablet, they can also learn from it and not just play.*

[2] *See* http://fcl.eun.org/learning-zones

During my observations, the school tablets were not taken home, but the ubiquity of learning apps allowed pupils to try some of the apps they used at school even when they were at home.

Having this handheld device, children in Observation 12 could write the word on their own device. This activity prepares them from an early stage to develop the useful skill of taking notes throughout their secondary, post-secondary and tertiary education. In this particular lesson (Observation 12), writing on tablets was equivalent to handwriting, and it only reached the substitution level of the SAMR model. However, in the activity, the children were able to take notes whilst moving around the room as required. This means that even when technology use is merely a substitute to traditional notetaking, it is apparently superior in portability, versatility and usability. In the next section I will further discuss the intuitive interaction with touch tablet interfaces.

4.3.4 Touch Screen facility

Since my observations were conducted with young children, I noticed that the touch screen facility made tablets intuitive to use. The practice of touching icons and zooming on the tablet screen which provided direct navigation, came more intuitively. Figure 7 shows Patrick pinching his fingers together and moving them apart on the screen to enlarge the picture whilst using Edu creations app.

Figure 7: Screenshot from Ob 11 20-5-2016 Ms Y video 6 (Observation 11) showing zooming

Later on, during Observation 11, another pupil, Philip, was using 'Educreations' to drag a picture from one side of the screen to the other, as shown in Figure 8.

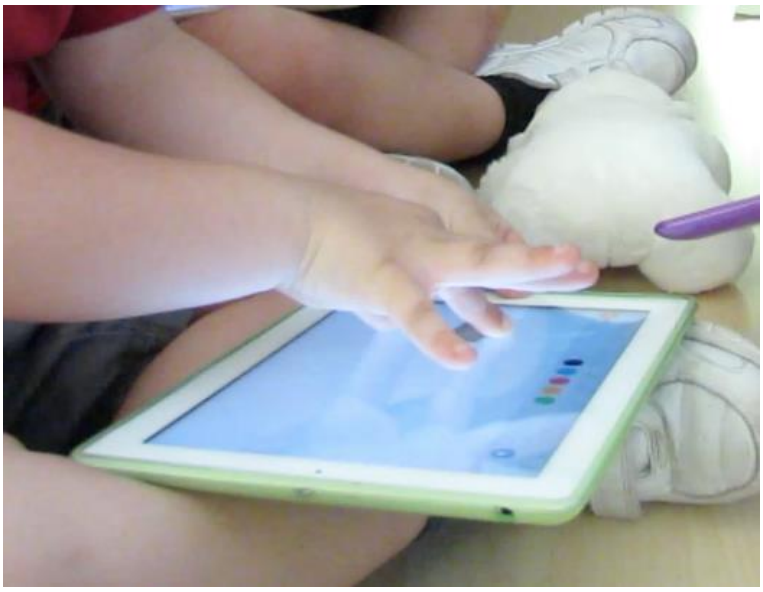

Figure 8: Screenshot from Ob11 20-5-2016 Ms Y video 6 (Observation 11) showing Patrick dragging a picture

Crescenzi, Jewitt and Price, (2014, p.88) argue that, "touch is increasingly foregrounded and designed within technology and human computer interaction research as an interactional mode". Some photos enabled me to acquire a deeper understanding of these interactions. Fig 9, for example, shows a child using the touch screen facility to join the dots. The direct-to-interface instead of hovering and clicking the mouse's button makes it much easier cognitively for young children.

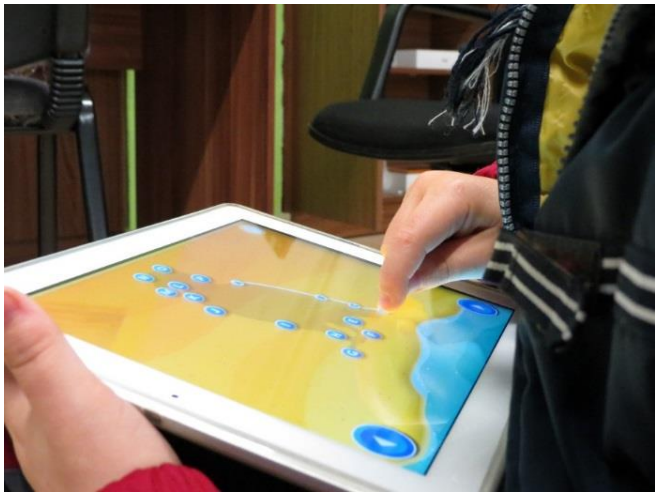

Figure 9: Join the dots using the touch screen facility

During my observations I could also see a range of tangible non-digital devices, which are based on physical tools such as sand or the felt of the weather and calendar chart. The children enjoyed touching the felt of the calendar and, before Observation 10, I saw them forming lines and other shapes with sand. Obviously, touch is important for learning across both digital and non-digital resources. However, touch on tablets relates to the fingers on screen, and so key differences exist, but the significance of these differences is dependent on context, as my observations demonstrated.

It was immediately evident that the tablets were intuitive and instinctive. But how did swiping compare to moving real life objects such as the jigsaw puzzle (Figure 4). During my observations, there were no tablet-based lessons which used jigsaw puzzles. However, I could observe children flipping letters on screen, which could replace non-digital flash cards. To compensate for the lack of physical tangibility, they used skeuomorphic visual design to simulate flipping non-digital flash cards. In my fourth observation with Ms Roberta (Ob4 9-3-2016 MsRmaincamera 4), when children flipped the letters, a picture of an object whose name began with that letter showed up, as when 'b' was clicked to show ball. Teachers generally take a long time to prepare similar non-digital flashcards, and these apps provided a very

positive learning experience without teachers having to make that effort. In addition, as noted in the first section in this chapter, tablets are motivating and therefore there may be children more motivated to learn sounds and letters through touching a screen rather than the physical flashcards.

Tablets offered easy interaction on the touch screen and children could easily navigate hyperlinks. During Observation 1 they accessed Read Write Inc. website. Like websites, apps also have this fundamental feature of hyperlinks, namely the possibility of redirecting from one place to another. During Observation 2 children accessed *Time2Read* App (Figure 10) and during Observation 4 they accessed Preschool Kindergarten.

Figure 10: Direct touch techniques of interaction on screen whilst using Time2Read App

During my observations I paid particular attention to the way children manipulated tablets, monitoring their reactions and any material-discursive constructions that were unfolding. Observation 12 was an opportunity to learn and consolidate their understanding of colours. Children chose the colours and subsequently they wrote the word, using their fingers. Unfortunately, despite the tablet's multi-modality capability, which will be discussed into some detail in the next section (4.5.4), the pupils hardly ever created their own artefacts. Much of the practice was replicating the paper and ink e.g. Ob 15 1-6-2016 Ms R 8.mov.

With some minor adjustments to the lesson design, during Observation 12 the pupils could have been asked to express themselves through painting by drawing the object which matches the colour's shape. In this way, learning would have been reinforced as an outcome of certain intra-actions. Similarly, the sand, which was on Jade's table before Observation 10, would have remained a lump of formless clay without Jade's physical intervention; an experience of meaning making which would not have existed without the mediation of this tangible object. Like the sand, tablets are tangible objects that allow children to construct new meaning, but teachers sometimes do not perceive of them in this manner.

In this analysis I am drawing this comparison with non-digital learning tools to show how tablets also offer some sort of tangibility through their touch facility. According to Wyeth, (2007,104), children appreciate the ability to "personalize and adapt flexible agent-based tangible technology". In my observations, robots and electronics blocks, as utilised in Wyeth's study were not used in the classes, and neither were tablets connected to another device besides the screen. In a lesson delivered by Ms Mandy, using bee-bots (Ob 11b, See Figure), tablets were not used since the devices could not be connected to tablets. Robotics, which can enable devices to be connected to tablets (be they with blue-tooth or Wi-Fi connectivity or not) can include block programming and thus encourage students to practise logical thinking, analysis, spatial reasoning, making connections, and using the trial-and-error method for problem solving. This was not the case in my observation sessions due to the unavailability of these devices in the schools I visited. Tangibility, therefore, was limited to the touch screen facility, but my data is sufficient to expose the relationship between "haptics" and touch technologies in relation to literacy learning. Figure 11, for example, shows a child during Observation 14 selecting the colour and pressing the associated letter. When he presses the two of them, his choice is marked as right or wrong. Therefore, as described by Simpson et al., (2013,

p.129), when touch is enacted, meaning-making choices for students are made at “physical and cognitive levels of awareness”.

Figure 11: Screenshot form Ob 14 1-6-2016 Ms Y 7 shows a child choosing colours and letter names.

This aspect is very important in the development of multiple modes in semiosis or meaning making, which are fundamental to literacy learning. These, however, will be analysed further in the next section.

4.3.5 Tablets as tools for multi-modal text production and analysis

In my study, students were young, and not only their writing but even their discursive skills and story-telling processes were still developing. However, the way they expressed themselves through writing words, using different colours, indicates a lot about their unique personalities, including design choices and favourite colours. Burnett & Merchant (2015) state that the visual design and alphabetical representation are integral elements of multimodality in meaning making. During Observation 14 (Figure 8), the teacher asked the students which letter starts with that particular sound name, which subsequently they had to colour. This lesson, which involved listening to words, random generation of words and touch screen facility, enabled

children to strengthen and develop communication, literacy and digital competences. It also gave them joyful emotions while learning.

As expected, audio material proved to be very beneficial to the learning of phonics. Ms Roberta preferred to use several off-the shelf apps, such as. 'Phonics Pumpkin' (Figure 12), to reinforce letters and sounds. Through my observations I had a first-hand experience of the insights into the research problem mentioned by Mack et al., (2015) when they stated that, "researchers can also uncover factors important for a thorough understanding of the research problem but that were unknown when the study was designed". I had been aware of tablets as multimodal devices but had never imagined how effective this could be in the teaching and learning of phonics. It gave me a sense of fulfilment, therefore, when I started consolidating and corroborating the literature with my observations.

A case in point was the use of audio and its effectiveness in fostering students' pronunciation. It evidently facilitated literacy learning and assisted language teachers, "to promote second language teaching" (Mohsen, 2016, p.1232).

> *Number one, now, number one, Kayden, number one. Wait a minute, now we need some sound. Let me show you how, so if we don't hear it, we press the sound again. Can you press it Kayden? Up here? You have to press the letter that sounds like 't'. [00:07:30]*
>
> *(Ob2 3-3-2016 MsR maincamera – Translated)*

Figure 12: Phonics Pumpkin

Another tablet facility which the teachers in my dataset made use of was the camera, which enabled students to capture images of artefacts they deemed relevant and store them. In general, teachers appreciated the opportunities that tablets can provide using the camera, sounds, graphics and other functionalities. The built-in input devices (keyboard, camera) and output devices (sound, screen), as well as network connectivity, make the tablet productive and useful on field trips and other out-of-school activities.

In my first observation, students could exploit camera functionality in their production of multimodal texts (see Fig. 13). They worked in pairs wherein each member had a card displaying the 'ch', 'sh' or 'th' sounds and they had to find the picture of an object whose name begins with that sound (e.g. chocolate, children). Subsequently, they took a photo of that picture and uploaded it on 'EduCreations'. Finally, the children wrote the word next to the picture using their Ipads. This exercise was repeated for all digraphs (sh, th, ch).

This lesson comprised the teacher's voice combined with camera facility and software, which allowed a description of the pictures, as illustrated in this data excerpt:

***Ms Yosanne**: Very good, t-t-thermos. What do we have here? What do you have in your pictures?*
***Pierre**: Wow*
***Ms Yosanne**: Chocolate, can you give me a chocolate?*
***Pierre**: Mhm.*
***Ms Yosanne**: Yes, that one — Sit down properly*
***Pierre**: C-c-chocolate*
***Ms Yosanne**: Take a picture.*

....

***Ms Yosanne**: Very good. What do you have in your picture?*
***Pierre**: Take it.*
***Philip**: Shoes*
(ob1 3-3-2016 MsY children1 Transcript – Translated)

Figure 13: Using camera functionality to capture real life objects (photo taken by child)

During Observation 11 they used the camera facility to take a picture of the number and add it to 'EduCreations', as in Figure 14.

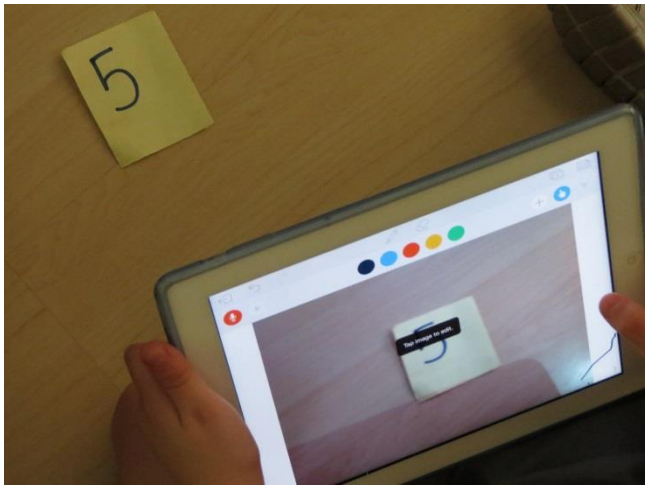

Figure 14: Using the camera facility

The main objective of this lesson was to teach numbers in Maltese, and it combined, in a very interesting way, tactile digital (touch screen facility) with non-digital (numbers written on paper and balls) methodology. The pupils were firstly required to understand the number in Maltese, then select it, add it to 'Educreations' using the camera facility and finally pick up the right amount of balls in accordance with the given number, as in Figure 15.

Figure 15: Counting balls

Another pedagogical affordance is the facility to use QR codes. The QR code lesson (OB 8 Ms Y) would not have been possible without the use of touchscreens. QR code generating allowed the teacher to input the information, which was related to a specific QR code. Figure

16 shows a child reading a QR code using the camera facility software capability to attribute meaning to that code.

Figure 16: QR code reading

Research shows how "students learn more effectively from words and pictures than from words alone" (Yu et al., 2010, p.152) and this affordance of multimodalities facilitates, "interdisciplinary learning, which allows students to construct their own knowledge while engaging in cross-curricular learning" (Hill, 2014, p.450). This is discussed in the next section.

4.3.6 Tablets facilitate cross-curricular learning

Dinuță (2014) states that in interdisciplinary learning the teacher establishes the didactic methods to be used, the didactic materials, the forms of organising the activity and the ways of linking the contents to be used. In my observations, the examples I could witness were far from what can be described as interdisciplinary learning. The most clear example was Observation 6b where, in an unplanned lesson, Ms Yosanne managed to use the app "Żaqqinu jagħżel x'jiekol" (Żaqqinu [Name derived from tummy hinting Gourmand in childish language] choosing what to eat) as shown in Figure 17 and a small "Matching" activity using

Educreations. This subject-focused app met Ms Yosanne's learning goals and enhance a healthy eating talk earlier on during the day.

Figure 17: Screenshot from Żaqqinu jagħżel x'jiekol where Ms Yosanne integrated literacy with Healthy lifestyle

However, there were several instances of cross-curricular activity which enabled me to reflect on tablets' affordances that cultivate and enhance interdisciplinary learning.

During the first observation, for instance, the main focus of the lesson was literacy, but numeracy was also integrated:

> *Ms Yosanne: Show her number three.*
> *Philip: Miss t-three.*
> *Ms Yosanne: Show her number three on your fingers. Show her number three.*
> *(Ob1 3-3-2016 Ms Y n2 maincamera)*

By enabling students taking photos of real-life objects, such as the chair and insert it to the app, tablets strengthened a more fluid connection between phonics, digital literacy and other subjects.

In another instance, even geography was interwoven within the lesson in a remarkably harmonious manner, as shown in this excerpt where Ms Roberta took the opportunity to explain what an island is.

Ms Roberta: To read, time to read. We are going to start reading and there are three different islands, OK? Three different islands, an island is a land surrounded by the sea.
John: Do I click?
Ms Roberta: No, not now, wait. So, Malta is also an island because we are surrounded by the sea.
(Ob2 3-3-2016 MsR maincamera – Translated)

Whilst like any other teaching approach, interdisciplinary learning can be possible without technologies, tablets afforded this because students were exposed more to different topics and competences. This sharply contrasts with what happens in other non-digital lessons where learning is narrowly focused on specific content and skills. The except above stemmed from the '*Time2Read*' app which leads the child through a fantasy world of 3 islands - Frozen Island, Tropical Island and Desert Island - these being of progressing difficulty. Interdisciplinary learning is not a new concept but the portability of tablets, ease of use and connectivity, facilitate the ubiquity of knowledge and proliferation of information. In my observations, students gained digital literacy skills, such as taking photos and using various aspects of tablets, together with other language and literacy skills. Digital literacy outcomes can be achieved when integrated with other subjects. In the first observation, children were taking pictures of objects in class, namely a thermos, chocolate, and their own shoes. Children were asked to bring these pictures and put them in the middle of the room.

Ms Yosanne: Very good, t-t-thermos. What do we have now? What do you have in your pictures?
Philip: Wow.
Ms Yosanne: Chocolate, can you give me a chocolate?
Pamela: Yes.
Ms Yosanne: Yes, so that....
Sit down properly
Pamela: C-c-chocolate
Ms Yosanne: Take a picture.
Pamela: Wait teacher.
Pamela: It's not good teacher.
(ob1 3-3-2016 MsY children1 Transcript – Translated)

Another competence that was indirectly taught to children was digital citizenship. Even though the pupils participating in this study were still very young, teachers intended to foster digital citizenship, which entails using technologies in a meaningful way. They taught various competences whilst engaging in different subject areas. In this way teachers enabled the children to reach a number of digital literacy outcomes[3] such as:

- I am able to identify and articulate my information needs.
- I can find, select, use and combine information from a range of sources.
- I can create personal information strategies.
- I can use various tools to manage my own learning.
- I can use various tools to learn by designing digital objects.
- I can use various tools and approaches to reflect on learning.

4.3.6 Tablets facilitate transmedia learning opportunities

In addition to enabling children to use various modes to create texts, tablets can also be used across media to reinforce learning. For example, texts on tablets were also projected onto a large screen in order to enable response and analysis. Hutchinson & Schmidt-Crawford (2012) described how a girl in their study, "liked the idea of being able to enlarge and project the images in sequence so that students could see a complete image of their perceptions of the story prior to reading". The participants in my study also appreciated the value of visualising particular content (e.g. OB 14 and OB 15 where material was shared using apple TV). In her interview Ms Mandy referred to mirroring on the apple TV and argued that, "they also have this type of system where you can mirror the tablet on the television screen; there's a television allocated to this." She mentioned this as an upside of tablet-mediated teaching and learning. It was not the case in these classrooms, but in some instances, tablets can be linked to smartphones, robots and other media devices in order to facilitate learning. The relative ease

[3] http://www.schoolslearningoutcomes.edu.mt/en/

with which this can be done through apps means that tablets are of value when facilitating transmedia learning.

4.3.7 Tablets enable creativity

The ease of software use and additional functionality, such as camera devices, enabled the teachers to promote creativity and be creative themselves. They made text production more intuitive, faster to develop and more amenable to modifications. During Oobservation 12, children were asked to pick up a colour and write down the word using that colour (See Figure 21). This task, however, did not serve much to stimulate their creativity. As Burnett & Merchant (2015, p.272) argue, building on students' repertoires of textual practices is "not just about an incremental expansion of the kinds of texts that students produce, but providing contexts in which students can draw in open-ended ways". The lesson (Observation 12) went on to be a little more open-ended, with the aim of enabling students to master an editing software. In this case, children used the off-the-shelf app 'Drawing Desk: Draw & Paint Art' (Fig. 18), which consisted of tools such as 3D brushes, several other brushes, shapes, typography tools, realistic brush tools, smooth eraser, ruler, smudge tool, water colour, and paint roller.

Figure 18: Children using 'Drawing Desk: Draw & Paint Art'

This created the ideal environment for the pupils to be more creative and to improvise to the best of their ability. However, it was ultimately the app which provided for this important competence of creativity. Marsh et al., (2015) found in their study that some apps enable children to create "a variety of original texts and artefacts including virtual constructions, drawings, paintings and stories". Customisable drawing and painting tools that enabled students in these Maltese classrooms to choose brushes, strokes, transparency and paint mixes, enticed students to express their imagination and develop their creativity.

4.3.8 Tablets can support language learning

One of the most evident advantages of tablet learning is the access to a multitude of engaging early learning applications. Regrettably, this was not the case with apps in Maltese. One of the few apps for Maltese Language learning for early years was '*Naqra Naqra*' (See Figure 19). This app was used during Observation 7 by Ms Roberta, who understood its potential benefits and took the opportunity to use it.

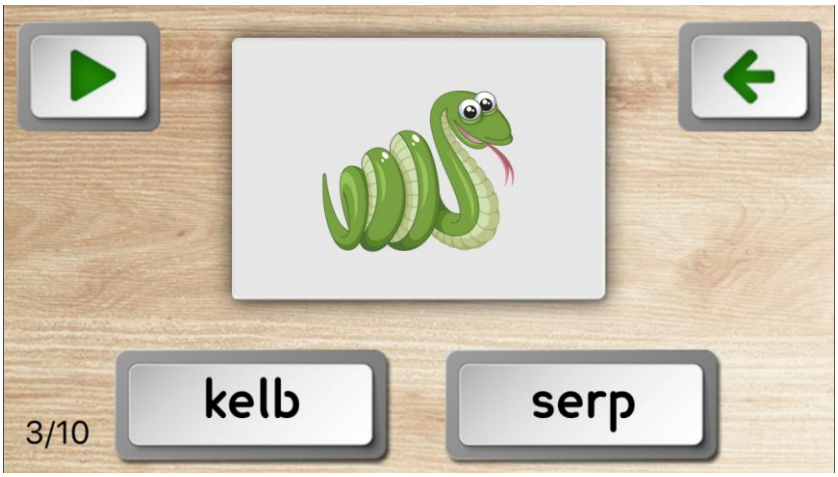

Figure 19: Screenshot of app Naqra Naqra

'*Naqra Naqra*' consists of word-to-picture matching and aims to develop phonemic and syllabic awareness by getting children to note similarities in the sounds of different words by juxtaposing them to one another. Figure 20 shows a photo taken by Jane, a child who participated in the research and managed to capture John pressing the correct answer.

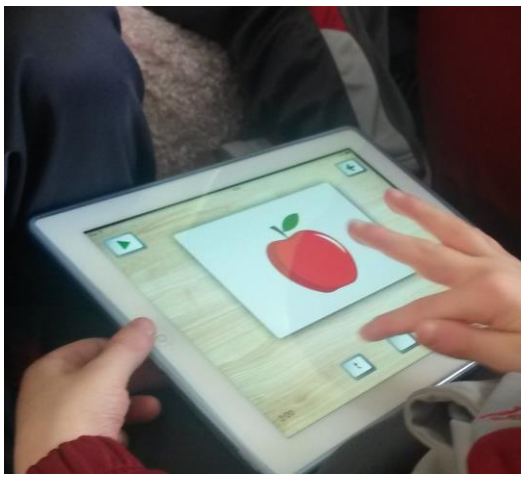

Figure 20: Photo taken by Jane showing John choosing the correct letter

Tablets enabled children to learn better how to spell and pronounce accurately when they could read the word and listen to the pronouncation on them. Somtimes this could be difficult to learn by listening to teachers. During Ob 15 1-6-2016 Ms R 1, Ms Roberta asked them how to write "immorru" (going). Her pronouncation was not clear and did not explain the difference between went (marru; but children mistakingly spelled it marru" and the right word "immorru" (going).

Apart from this app and "Żaqqinu jagħżel x'jiekol", teachers could not find other learning tools online. In the absence of off-the-shelf resources in the Maltese language, the e-Learning centre created a number of reusable learning objects, but these are not accessible on tablets since they are flash-based. Two of the learning tools created consisted of PDF books which allowed augmented reality, but during Observation 12 Ms Yosanne preferred to use the traditional book since the online book for that particular age group was not readily available yet. The e-Learning

centre also created a number of e-books but these were only available on Android devices. For this reason, Ms Mandy had to bring Android portable devices from the e-Learning centre to be used for these apps.

4.3.9 Tablets can enable teachers to create educational resources using apps to support language learning

Open-ended apps can enable the construction of educational resources. An opportunity provided by the tablets was the possibility for pupils to answer quizzes constructed by the teacher (Ob 15 1-6-2016 Ms R 6.Mov). This particular app allowed the creation of animation and embedding of voice-over for the construction of quizzes. The children could watch custom-created content, which was created by the teacher, but could also have been recorded by the children themselves. In this way the teacher could have allowed a mixture of both 'polished' text and the children's own productions, as strongly recommended by Burnett et al., (2014), thus helping children participate and feel a sense of ownership towards their own learning. In this case Ms Mandy created an animated video about Maltese vowels, using '*GoAnimate*', and uploaded it on YouTube. Subsequently, Ms Roberta created an interactive video lesson by adding questions and text to the existing video, using '*Zaption*' (Fig. 21).

Figure 21: 'Zaption' used to add questions to a video created by Ms Mandy using GoAnimate

Another useful app was '*Quizlet*' (Fig. 22). This open-ended app enabled the teacher to create more opportunities in Maltese language learning, based on the students' interests and needs. Ms Yosanne created this learning tool which accompanied her curriculum with text and images. The app also allowed built-in text to speech audio.

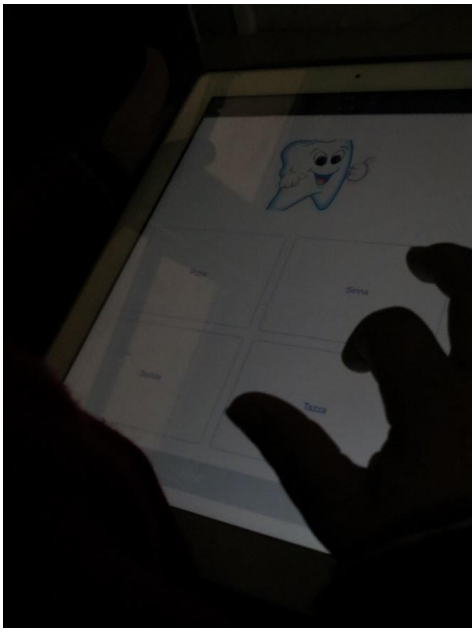

Figure 22: Using 'Quizlet' app to create Maltese Language content

Maltese is a phonetic language by its own nature but learning phonemics is always an essential part of language learning. This app also enabled the juxtaposing of individual sounds (phonemes) in order to form words. In the excerpt, with the help of Ms Yosanne, the child is learning how to write the word '*kaxxa*' (box).

> ***Pierre**: Box (Kaxxa)*
> ***Ms Yosanne**: Now write it, ('kax', 'kax')*
> ***Pierre**: 'A'*
> *(Ob5 13-4-2016 MsY video 6 - Translated)*

Meanwhile, Ms Roberta confirmed in her interview that her choice of open-ended apps was particularly motivated by the requirement of a student (Jennifer) who could not understand English:

> *The fact that we had a student who did not follow the English language but only Maltese, created a bit of an issue because most of the time the applications in Maltese were not readily available. I couldn't find any which you could just use but you had to create them yourself. When you have to create these and use the Maltese fonts, not all the applications gave you this option, so the limitations increased. However, you still try to see what's best and try to work on those rather than having a negative perspective.*

Indeed, I believe that using tablets facilitated this differentiated teaching strategy because lessons had to be tailor-made for Jennifer so that she could access the mainstream curriculum. I could understand the difficulty that Ms Roberta had with finding close-ended apps in Maltese, and this issue of the choice of apps is addressed and explored in Section 4.4.3.

4.3.10 Tablets facilitate personalised and autonomous learning

The use of the term 'autonomous-learning' in this study refers to the opportunity for children to develop and shape their own learning. This study does not compare formal with informal learning, and my observations are limited to tablet usability in a formal setting. Ms Roberta discerned a potential in tablets to facilitate autonomous learning. She echoed the same thoughts expressed by the participants in Clark & Luckin's study (2013, p.21) who, "felt that the devices enabled them, as teachers, to promote independent learning, to differentiate learning more easily for different student needs and to easily share resources both with students and with each other." In my second observation (Ob2 3-3-2016 MsR maincamera – Translated), Ms Roberta asserted that tablets could never replace her role as a teacher, but she acknowledged that they did facilitate her work and allowed children to progress at their own pace. She explained that

there were times when direct instruction was used, as when explicit instructions needed to be given, but in the end, she allowed the children to work on their own and at their own pace.

> ***Researcher**: ...this is a lot of self-learning time, they learn a lot, kind of... [00:12:08]*
> ***Ms Roberta**: Yes, here I try as much as I can*

Ms Yosanne also highlighted the advantages of score points in fostering a sense of autonomy. In Observation 5 I remarked that children could test themselves, thus being able to work on their own without the teacher's assistance:

> ***Interviewer**: They have score points, that's an advantage.*
> ***Ms Yosanne**: And it shows you, you have to write it, for example this one... [00:00:34]*
> *(Ob5 13-4-2016 MsY video 6 – Translated)*

Figure 23 shows '*Time2Read*' app which was used to teach digraphs. This app enabled children to identify letters and sounds. The activities were tailored to the children's needs and they could be taken through the learning process step by step, working at their own level. The levels of difficulty were well balanced, and the small steps ensured that the child progressed successfully through each level.

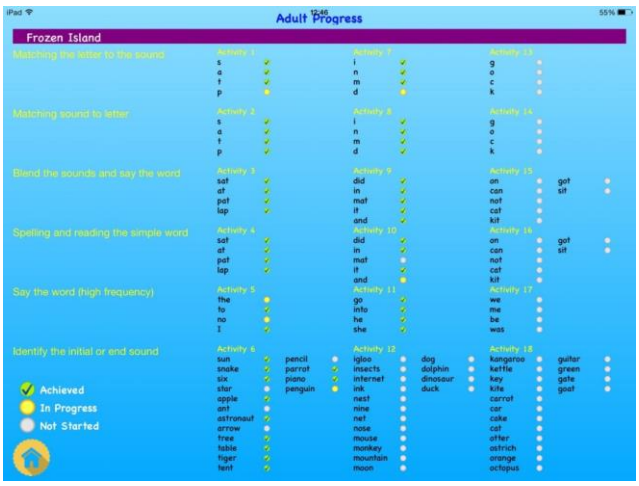

Figure 23:Screenshot showing data provided to teacher following a Time2Read app activity

Learning Support Educator, Ms Leanne, was hopeful that such possibilities would enable her to monitor Jennifer, the pupil assigned to her, and to see whether she was struggling at any particular level.

An important feature of learning assessment is feedback. Hattie and Timperley (2007, p.81) describe feedback as "information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding." In my observations it was also quite evident that the pupils' engagement was higher and that they appreciated this feedback. The pupils also exclaimed excitedly every time they got a correct answer (see Fig. 24 for an example of such feedback).

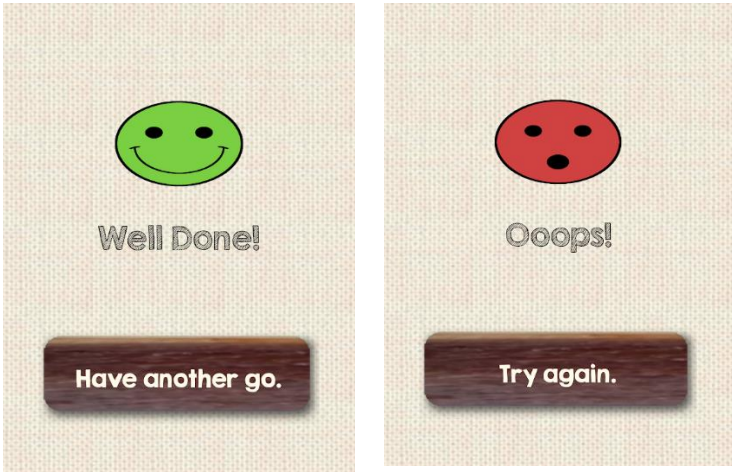

Figure 24: 'Tricky Words 2' app instant feedback

Learning from mistakes is an essential part of any learning process (Gershon, 2017). Admittedly, educators and carers are always tempted to keep children away from failure. However, after noticing the sense of confidence gained by the pupils whilst using apps on their own, I deduced that letting them learn from their mistakes is one of the most effective learning-to-learn strategies that adults can instil in children in their own custody. This evokes the same learning experience extolled by Flewitt et al., (2014, p.297) who observed that, while using tablets, "children particularly enjoyed the facility to undo and review stages of their work

which reduced the perceived consequences of making mistakes and appeared to increase confidence".

Even the pupils themselves expressed satisfaction at their peers'' confidence gain and achievement. Jacob and Jeffrey, for instance, glowed with enthusiasm on witnessing John's achievement, who is usually a struggling pupil:

> ***Jacob**: Look at John, Miss, John!*
> ***Ms Roberta**: Well done John.*
> ***John**: Miss I did this. [00:04:53]*
> ***Ms Roberta**: And done, which one? Done.*
> ***Jacob**: I want to click.*
> ***Ms Roberta**: Done.*
> ***John**: Miss? I did this (giggle).*
> ***Jeffrey**: Miss, look at what Jean Claude did! [00:05:12]*
> ***Ms Roberta**: Well done.*
> *(Ob2 3-3-2016 MsR maincamera - Translated.docx)*

During her interview Ms Roberta explained that:

> *Due to the fact that the tablet, or IT in general, is autocorrecting, unlike the teacher that needs to tell you to stop, erase or amend, the students were learning more because they were instantly alerted to their own mistakes. In order to move forward you need to provide the correct answer, so they were giving their best to provide the correct answers and I think that helped them a lot.*

Open-ended apps also lend themselves admirably to taking risks. During Observation 5, Ms Yosanne used '*Quizlet*', which is an open-ended app, but children in this case were just consumers. I noticed that she just gave them simple instructions, as shown in excerpt below, and then they could click pictures on their own:

> ***Ms Yosanne:** Tower ('torri'), so click on the word and on the picture of the tower. The tower image is not showing, so click on the empty box, on scarf ('xalla') and scarf ('xalla'), on tooth ('sinna') and tooth ('sinna') and so on until you do them all, is that clear? The more you practise the*

faster you can get and consequently you will be able to do them in less time. Cart ('karru'), oh, oh, cart ('karru') and you keep going OK? You may start, let's do them together. Not at random, you have to read the word first — read this [00:00:49]
(Ob5 13-4-2016 MsY video3 – Translated)

The more students experienced success, the more their self-esteem increased. These positive experiences empowered them by giving them confidence (Jones et al., 2006) and, buoyed by positive experiences of learning, they sought to learn more. As Flewitt et al., (2015, p.291) state:

> Through action and interaction with human and physical resources, in particular social worlds, individuals engage in collective imaginings of themselves as 'competent', 'smart', 'incompetent', 'delinquent', etc. As mediating artefacts, we posit that iPads are one of many cutting-edge, culturally powerful yet enigmatic technological tools with the potential to invoke empowering 'figured worlds' for young learners concerning themselves and their attitudes towards literacy.

Enabling students to learn at their own pace facilitated individual attention in the classes I observed. What I perceived, for instance, was that children do not reach the same milestones at the same stage of their studies. In the excerpt below, Ms Roberta explained that not all students had grasped letter names and phonics simultaneously:

***Interviewer**: Miss, do they know the letter phonetically?*
***Teacher**: They should know them both.*
***Interviewer**: Both?*
***Teacher**: 'L'-'l'-'l'-'l', 'a'-'a'-'a'*
***Interviewer**: Because I noticed that he said the letter name not the letter sound*
***Teacher**: Because they are not all on the same...*
(Ob2 3-3-2016 MsR maincamera - Translated.docx)

However, tablets allowed them to personalise the learning experience and focus on those letters they needed to learn. Ms Yosanne strongly believed that reading could improve if tablets were used. In her interview she explained how they can be beneficial in teaching letter recognition

because children are motivated by the fact that they can do the reading themselves. She added that "*There is no need for the teacher to push them, sort of ...One can just do it, as if in writing; they just do it and they are learning from the different apps that we have used*".

Pronunciation was another aspect which was facilitated by the use of tablets and could be practised by the pupils. From the outset of my observations, I could easily notice that repetition and drill were used to instil the sounds, stress and intonation of pronunciation:

> ***Ms Yosanne****: Thermos, th-th-thermos, very good.*
> ***Ms Yosanne****: Ch-ch-ch*
> ***Patricia****: Ch*
> ***Ms Yosanne****: Chain, chain, ch-ch-chain….*
> ***Ms Yosanne****: Who has ch-ch-chain?*
> *(ob1 3-3-2016 MsY n2 maincamera – translated)*

In my second observation, Ms Roberta stressed the syllables in the pronunciation of a particular word:

> ***Ms Roberta****: How do we write frozen? 'F'-fro, fro, fro*
> ***John****: 'R'*
> ***Ms Roberta****: Fro, 'o'*
> ***John****: 'O', 'z', 'e', 'n'*
> *(Ob2 3-3-2017 MsR maincamera)*

The tablet made this process interactive and learner-friendly, since it easily lent itself to repeated practice and exposure through a variety of different methods:

> ***Ms Roberta:*** *If you do not hear it properly press replay, green and two, green and two.*
>
> *(Ob 13 25-5-2016 Ms R 5 – Translated)*

Despite the opportunities that tablets can offer, as handheld devices, most of the lessons observed fell short of the standards in Burnett and Merchant (2015)'s recommendation for "improvisation and experimentation". Teachers were not quite at ease in encouraging children to work things out for themselves, starting from their existing knowledge. During Observation 16, for example, children had an excellent opportunity to use an off-the-shelf app '*Mel's Phonics CVC lite*', which allows children to be more involved in the learning experience and participate more actively. '*Mel's Phonics CVC lite*' applies a Montessori approach and in this case, children were practising blended sounds. However, it was evident that the teacher (MsR) was exercising excessive control, allowing little room for discovery learning and autonomous decision-making (Ob6 13-4-2016 MsR video 2.mov). At one point, for instance, the teacher told the child (not visible), *"Don't touch it for now"* and a few seconds later, she told John, "*Have I told you to touch the tablet? Or do you want me to take it away from you?*" (translated from Maltese). This is, perhaps, not surprising given that teacher professional development in using tablets was, at the time of the study, very limited in Malta.

4.3.11 Tablets facilitate collaboration

Collaboration is one of the key competencies in the digital competence framework. From a technological point of view, this can be linked to the tablets' portability and their connectivity. From an educational perspective, collaboration is one of the six Cs: Critical Thinking, Collaboration, Communication, Creativity, Citizenship / Culture, Character Education / Connectivity (Fullan & Scott, 2014), and thus merits attention.

My own experience bore a strong resemblance to that of Clark & Luckin, (2013, p.21) who stated that, throughout their observations, teachers, "…felt that the use of iPads in the

classroom caused them to rethink their professional role and facilitated greater collaboration between themselves and students". In my case study, Ms Yosanne and Ms Roberta collaborated with one another and learnt from their own experiences. For them, tablet-mediated teaching and learning was a new challenge, which brought them together in a joint effort to share experiences and resources for the benefit of the pupils. Ms Yosanne (Diary Ob 12) discussed how tablets could improve her experience in e-twinning, empowering students to produce something on their own. She told me how, although the e-twinning platform was used to share digital content, much of the educational material produced by the children was still what she described as "traditional". Tablets, therefore, were not just a change in medium but an opportunity for children to create, develop and share their own content. Social knowledge is learned through meaningful interaction and experiences, and it was evident during my observations that students were willing not only to share their own work, but to help each other. During my second observation (Ob2 3-3-2016 MsR maincamera), for instance, Jacob was happy with John's progress, who usually encounters some learning difficulties. In a way, therefore, tablets enabled some students to scaffold the learning of others, although this does not imply that it can only happen in tablet-mediated teaching and learning. Ms Yosanne encouraged working in pairs during observation 1. However, my data does not show that tablets really increased collaboration between children more than other tools. Moreover, they did not really foster a collaborative classroom. There was evidence of cooperative learning where children helped each other or maybe worked together on a structured activity, but not necessarily collaboration. Ms Yosanne tried to foster some level of cooperation among pupils by asking them to work in pairs (Observation 1). On the other hand, 'closed' apps, which were more common in Ms Roberta's lessons, did not achieve this level of cooperation. I draw once again on Romeo et al. (2003, p.336) who argue that touch screens allow children "to pursue their individual goals as opposed to encouraging them to cooperate and achieve a common

goal". Personally, I observed pupils interacting with devices, but I could hardly see them interact with one another. This requires a shift in the teachers' approach, I would argue.

Besides inducing collaboration between students, tablets may have prompted educators in my data set to collaborate more with one another. Sharing of resources and discussing actions to address diverse students' needs were an essential part of Ms Yosanne's and Ms Roberta's methodology. Occasionally, they also opened the door that connected the two classrooms. Nonetheless, the learning curve through the use of tablets proved to be remarkably higher, for not only did the teachers collaborate with each other to improve their practices, but they also resorted more frequently to the e-Learning support teacher for her assistance. Ms Leanne, the learning support educator, also had to keep abreast with this new technology so she had to cooperate more with the teachers. In the light of these practices, it would be justifiable to state that tablets may facilitate teamwork, collaboration and collegiality between teachers. Yet, this also requires pedagogical training and teachers need to be assisted in this regard.

4.3.12 Tablet usage to fight digital and social inequalities

'St. John Paul School' (name changed for ethical reasons) was one of the first schools to start using tablets in Malta. The reason behind the introduction of these tablets was because they offer diverse learning opportunities. Ms Yosanne confirmed this and, during her interview, explained how through the use of tablets she can address different abilities:

> *... by means of tablets I can reach different children's levels rather than giving them something ready which they can do at home...something that I can help with and help them achieve further. Rather than learning one thing and that's it, you can learn a variety of things.*

This excerpt shows that Ms Yosanne was aiming to use tablets as literacy tools to enable her reach different learning abilities. She moved away from the one-size-fits-all approach and through different learning strategies, including tablet learning, she aimed to provide learning that is relevant, meaningful and engaging for the students.

Despite the fact that state education is free and compulsory education is often linked with "social mobility and as a way out of working-class origins" (Ward, 2014, p. 710), this factor alone will not eliminate all the digital and social barriers. I also noted that, despite the fact that all child participants in this study hailed from the working class and lower middle class, all children with the exception of Patricia had a tablet at home. This implies that digital divide is a much more complex phenomenon than simply a financial barrier. Rather, the digital divide also relates to the use that devices are put to, and the types of devices to which children have access at home and school (Selwyn, 2016). Meanwhile, it has become more important than ever to equip pupils with the necessary digital competences, which are a prerequisite for a 21st century environment. Ms Roberta made a clear reference to this reality in her interview:

> I believe that due to the fact that children now live in a digital age, it would be erroneous if we didn't give them the opportunity to also use ICT; not only by means of tablets, because we have also done a lot of work in class and lessons were delivered by means of an interactive board, so I imagine that we have provided them with a vast experience.

Ms Roberta also aimed to provide flexible and diverse strategies for students. Despite the possible financial constraints, tablets enabled her to diversify her teaching in order to create a more inclusive environment even for students with special needs. One of the students, Jennifer, had a hearing impairment and tablets enabled the teacher to cater for her needs. I was informed that Jennifer had been advised to focus her literacy learning on one language, her native language, so the teacher had to adapt her teaching and provide Maltese content. Very often

she had to provide books or handouts, which also entailed extra photocopies. Although apps in Maltese were limited, as shown in section 4.3.8, teachers could use open-ended apps to create learning tools. Apps, irrespective whether they are closed or open-ended, are also an expense for schools, and despite the fact that there open-source solutions, educators still have to evaluate the reliability of the content. Selwyn (2016, p.115), despite his criticism about large companies being involved in education, still questions whether open source principles can work in education, or whether they are too idealistic.

4.3.13 Summary of pedagogical affordances

During my five-months observations I noticed that added value can be gained by trying to use tablet devices in the classroom. Tablets provided instantaneous feedback to students. They offered a number of adaptive learning solutions, such as different levels and interactive applications. In some cases, especially in Ms Roberta's class, they also provided adaptive learning solutions for Jennifer, who had a hearing impairment. Interactive applications kept the students engaged.

These pedagogical affordances can be summarised in the way described by Hutchison, Beschorner, & Schmidt - Crawford (2012, 23) who stated that "students were also highly engaged and able to demonstrate unique and creative ways of responding to text using a technology tool that offers some unique affordances to users". This is a statement with which I can easily relate, following my fruitful experience with these pupils. Many of the pedagogical affordances of tablet devices, however, were met with challenges. Most of the pedagogies that are responsive to the 21st century competences, which students require for life, were still lacking. Despite the fact that most teachers have moved away from the traditional teacher-centred pedagogy, when it comes to tablet usage, more work needs to be done in terms of

empowering students with the capability to create and innovate their own work.

It is precisely for this reason that in the next section I am going to present and analyse the challenges of using tablets in class from my own observations in these two classrooms. A presumption I had was that student-centred learning and tablet-mediated teaching and learning require a significant reduction in the syllabi content. However, during the research process, I could notice several other important aspects such as the competence of teachers themselves to integrate tablets in their teaching, and other difficulties which the devices themselves may pose. These issues are discussed in the next section.

4.4 Challenges of tablets

In spite of all their benefits, tablets also pose several challenges to teachers, both in terms of their hardware limitations and also in terms of their integration within the curriculum. Pegrum et al. (2013) mention several drawbacks of mobile-held devices, such as the small screen size and software issues, particularly compatibility and network issues. I believe that these issues are not strictly related to hand-held devices. However, due to their unique features, such as portability, the difficulties are somehow intensified.

During my observations, the major challenge for teachers in terms of tablet usability was the insufficient time to complete the syllabi. It is for this reason that Ms Yosanne was compelled to postpone her last lesson. Tablets offered new learning opportunities in the classroom, but they also required pedagogical changes more than other technologies, such as the interactive whiteboard and personal computers at the back of the room. Teachers also complained about the time and skills required to use apps (as in Ms Roberta's interview), but they were also guided by Ms Mandy, the e-Learning support teacher.

Another possible issue to consider would be the number of pupils in a class. The classes I observed were relatively small and this enabled teachers to give individual attention to their pupils. However, this set me thinking about the challenges of tablet learning within a larger context.

4.4.1 Integration of tablets as a "new" technology

Despite the fact that participants in my study were willing to participate in the study and use technology, I could still perceive a number of difficulties and barriers to overcome. As Walling (2014, p.4) posits, "not every rollout of new technology runs smoothly, and tablets are no exception. Glitches happen – with inadequate networks, unreliable devices, unworkable policies, erroneous practices and so forth". In the context of my research, there were no wireless access points in classrooms, although the use of downloaded apps facilitated this. Meanwhile, syllabi and curriculum content remained a huge concern and teachers had to strike a balance between holding innovative lessons and coping with the vast syllabi which tend to be prioritised by parents and other stakeholders.

In view of this I would like once again to draw on Ertmer et al., (1999) who categorised group barriers through factor analysis: first-order extrinsic barriers and second-order intrinsic barriers. First-order extrinsic barriers refer to unreliable network connections, which in my case proved to be a problem, lack of wireless access points in classrooms, and inadequate training in using technologies. Despite these barriers, the presence of Ms Mandy and her support in using technologies was quite helpful to both teachers.

Understandably, the teachers in my study required support because they were among the first educators to use tablets within a classroom context in Malta. From the point of view of a person with a technological background, like myself, considering tablets as "new" might be somehow awkward. However, the 'newness' of tablets is in their pedagogical usability. I noticed that the teachers' lack of technological experience during lessons 14 and 15 was impeding them from delivering more participative lessons. The reason was because they didn't know how to connect one device to the digital media player and micro console. The implications of this were that children did not have the tablets readily available in their hands. Furthermore, teachers did not have enough time to practise strategies for embedding digital literacies within their vast syllabi. Notwithstanding, Ms Roberta and Ms Yosanne remained motivated to use tablets because they believed that in a technology-driven world, traditional teaching and traditional pedagogical approaches do not reach the required standards in terms of the expected learning outcomes. Similar to Flewitt et al., (2015, p.295) the teachers in my study also showed concerns that technologies are moving so fast and students are becoming accustomed to the high definition graphics and interactivity which contrasts to that in traditional books.

Second-order extrinsic barriers are described as "intrinsic to teachers and include beliefs about teaching" (Ertmer et al., 1999, p.54). Despite the teachers' effort (Ms Roberta and Ms Yosanne) to be innovative, most of the lessons were still very narrow in terms of fun and creativity. For instance, I noticed little game-based learning. Burnett & Merchant (2015) recommend that teachers should encourage creativity and be open to improvisation. One of the shortcomings I noted was that the lessons were too syllabus-oriented. At the time of my research the learning outcomes framework was not in place yet, so the focus of teachers was more on the language skills, including grammar, rather than on competences such as creativity.

While both teachers acknowledged the affordances of tablet devices, they found it difficult to integrate them within their teaching. One of the main challenges faced was curriculum mapping of digital literacy outcomes and literacy outcomes which enabled teachers to use tablets in a meaningful way. Ms Mandy explained that tablet learning is not a discrete subject but that it is actually embedded in literacy learning. Tablets, after all, are meant to enhance learning and to help teachers and pupils achieve better literacy outcomes. In her interview, in fact, she accentuated the importance of a seamless fusion between the use of tablets and the curriculum:

> *When we plan the lessons together generally, we incorporate it with the existing curriculum, meaning that when the lesson is held, this is not something done separately, on its own.*

Time in itself proved to be another constraint. Ms Roberta, in her interview, admitted that although the end result of using tablets is rewarding, it comes at a price of extra work in terms of planning and more careful consideration of resources to be used:

> *This is not like having a copybook and maybe an idea comes to mind at that time. In the case of an application you need to plan ahead. However, the feedback of children and watching them enjoying themselves gave her satisfaction and in her own words it was "worth the extra work".*

Using tablets posed a challenge not only for teachers but also for pupils. As young children, they head to acquire new skills such as moving from one app to another, turning on the sound and taking pictures. A common concern was that pupils might delete apps and teachers were not prepared how to avoid this. Burnett et al., (2014, p.162) warn that "we must avoid assuming children and young people have an innate ability to use new technologies". In my observations, in fact, time and again I noticed children asking the teacher for assistance. (e.g. ob1 3-3-2016 MsY n2 maincamera)

In Observation 13, Jacob and Jeffrey were finding difficulties and Jacob also asked the teacher how to follow the instructions, as shown in this excerpt:

> *Jacob: The red Miss? What do I have to press? Miss? But what do I need to press? [00:02:57] (Ob 13 25-5-2016 Ms R 5 – Translated)*

At one point, Ms Roberta told another pupil John that he was not following the same page and advised him to follow the instructions. John, in fact, had been accessing a higher-level page which he couldn't cope with on his own.

Updates, signing-in to get access and adverts can make the use of tablets even more confusing. In my 4th observation, for instance, John got confused because of the sign-in to iTunes (Ob4 9-3-2016 MsRmaincamera 4). In my second observation, I also noticed students having a difficulty in joining activities:

> ***Researcher:*** *Listen, enter your name first because otherwise you will not be able to play. Do you know how to write your name? Do you know how?" (Ob2 3-3-2016 MsR chidren2 – Translated)*

Understanding the concept of QR codes was a pre-requisite for the lesson where these were used (observation 8). This means that while tablets allow direct manipulation, using touch screen rather than other peripheral devices such as keyboard and mouse, some of the uses that are meant to provide inquiry-based learning may actually pose difficulties. The prospects of autonomous learning afforded by portable devices would be low if the children themselves lacked the required digital literacy skills. In this context, age is another important factor since the pupils in my data set were very young and therefore may not have grasped the digital competences in software and hardware.

4.4.2 Portability

Despite the promising benefits of the anytime-anywhere concept thanks to tablets' portability, this does not come without any challenges. Tablets, for instance, might cause more disruptions

in class and distraction to the lessons (Christensen & Knezek, 2018, p.380). In my research study, teachers also showed concern about the time spent swiping, swishing and tapping.

During Observation 13 Ms Roberta scolded the pupils for not listening to her explanations since they had already started tapping on their tablets:

> *Now, shh, listen, listen, listen, if you keep talking, we will not be able to listen. Did I say you can start on your tablet? I said, "look here", so that you'll know how to use it and then you can use yours on your own. (Ob 13 25-5-2016 Ms R 5 – Translated)*

Later on, she also had to deal with pupils who were trying to experiment with something different entirely:

> *You are not on the same activity I told you to get into; those words are more difficult; we didn't even do them yet. (Ob 13 25-5-2016 Ms R 5 – Translated).*

In section 4.3.3 I described how portability offers more ease of use to young children. Not only are tablets keyboard-less, as portable devices, but they also do not require any cables while remaining constantly connected. This allows more frequent use which, on a less positive note, may also lead to some form of addiction. Before the time of my research, tablets had already been a favoured source of entertainment (Observation diary note Ob1) among children in their household environment. During an informal conversation Ms Roberta (Observation diary note Ob4) showed concern over the increasing screen time due to tablets being more attractive than television. Linking screen time to addiction is contested (Livingstone, et al., 2019), but the overall perception of teachers was that tablets were increasing screen-time leaving less time for non-digital play and study.

On the other hand, the usability of tablets in schools may be far more restricted. In schools wi-fi was not always present and 4G connection would entail further internet safety risks. In my observations, tablets had to be used in the computer room only, despite their portability. During her interview, Ms Mandy mentioned the fact that some apps require internet connection which, in this case, was only available in the computer room: "*There is a Wi-Fi connection if the app they are going to use requires Wi-Fi and they can use the tablet there.*"

Other issues of portability were related to risks of breakages and damages. Tablets were always carefully stored in a cupboard and hardly ever carried by teachers due to the risk of accidental breakages. Teachers often had to carry files and a stack of books, so it was also difficult for them to carry these handheld devices to their classrooms.

4.4.3 Choosing Apps

As described in section 4.3.5, teachers in my dataset tried to enhance their teaching and learning through the multimodalities afforded by tablets. Tablets, however, still have some hardware and software limitations compared to Personal Computers. One of the stumbling blocks when it comes to educational software was that most of the websites which teachers had been using on their laptops and interactive boards were flash based, e.g. 'readwritethink.org' and 'starfall.org'. Flash content, however, was not available on tablets and this created a hurdle since many educational websites were flash based. Teachers found out, to their disappointment, that these websites worked perfectly on laptops but not on tablets. The Reusable Learning Objects (See Figure 25), a number of digital activities created by the e-Learning Department for local teachers and made available on the Learning Management Platform, were also flash-based. These were intended for older students (year 3 onwards), but high achiever students were also interested in some of this content.

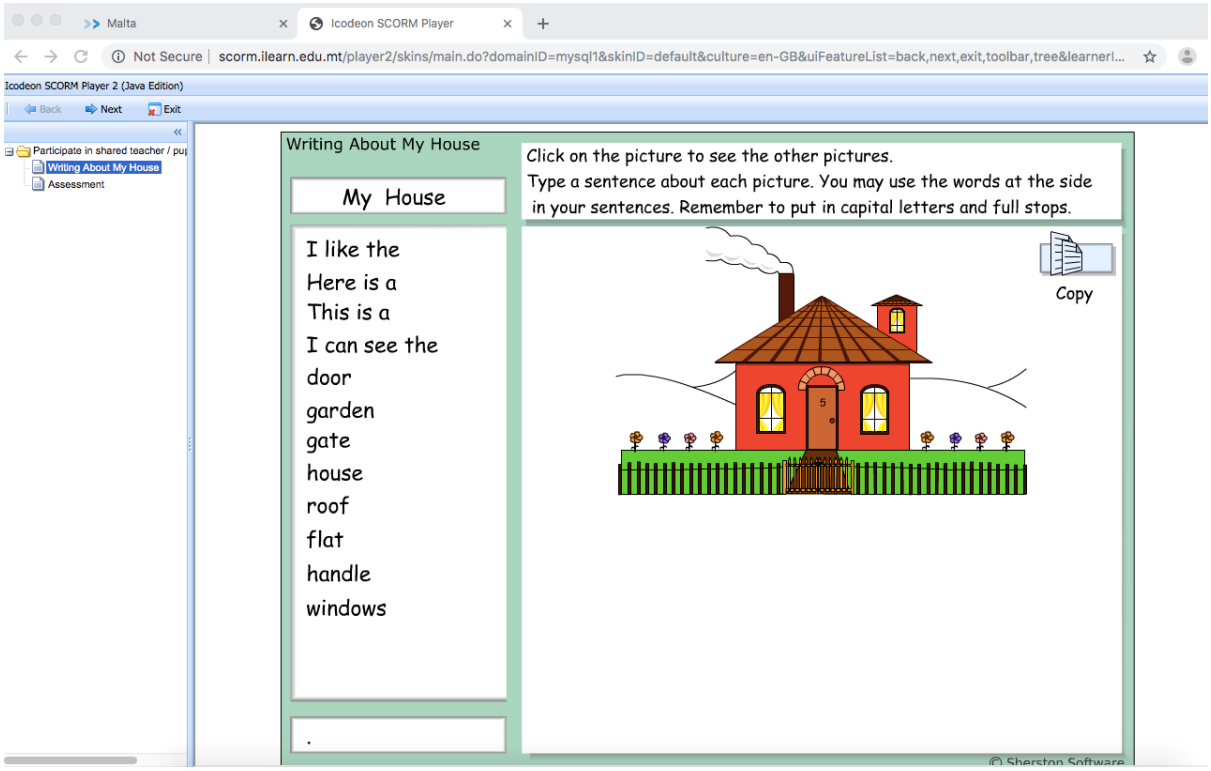

Figure 25: A Flash-based Reusable Learning Object created by the e-Learning Department.

On a positive note, though, by the time of writing this thesis, a number of websites (e.g. 'topmarks.co.uk') are using newer technology such as HTML5 and other web technologies that are supported by tablets. Besides, tablets in the observed classrooms had 'Puffin Browser', which could access flash content. In some cases, however, the teachers had to choose 'Request Desktop Site' to reopen the same page in the desktop mode in order to access Flash content. Consequently, in my first observation, (Ob 1-3-3-2016 Ms Y n1maincamera) during an exercise where children had to write the missing letter, the teacher was constrained to use the interactive whiteboard because the educational resource was flash-based.

Nevertheless, teachers took the opportunity to explore a number of wonderful educational apps that were tailored for tablets. In my 13th observation, for instance, Ms Roberta remarked how '*Tricky Words 2*' app combined several skills, but all closely related to the curriculum. "*It's*

very good because it has both colours and tricky words together, so they have to choose the colour and the tricky word accordingly, not at random." (Ob 13 25-5-2016 Ms R 7 – Translated). As Flewitt et al., (2014, p.295) point out, these apps offer "creative and independent learning in playful ways that slotted into curriculum delivery."

Nevertheless, I noticed that teachers also had put a substantial effort into finding apps appropriate for their syllabi. As a matter of fact, choosing the right apps proved to be a feat in itself. Ms Roberta in her interview told me that choosing apps required a lot of research and that she tested the games herself beforehand:

> *Absolutely, the fact that you have the tablet as an extra resource, requires time; you need to research more, you need to try more, you cannot just choose an application which you think is good and put it there without testing it first. You need to see its pros and cons.*

Even Ms Mandy pointed out this difficulty:

> *Let's be honest; there aren't apps that you can find ad hoc how you exactly want them, so if we talk about Maltese, for example, apps in Maltese are quite few and some of them are not even available on iPads.*

However, she also affirmed that a teacher does not necessarily require a particular closed-ended app because in her own words:

> *…an open app like 'Educreations' or 'Drawing Desk', these are all apps where the teacher can do the letters or numbers because she has a blank screen and the children can, for example, write something or an app where they can record themselves, for example a story or they draw something.*

This was one of the first decisions that teachers had to make; whether they were going to use closed apps or open-ended apps. A well-defined, succinct description by Flewitt et al., (2015, p.297) is that, when used effectively, closed apps created by experts "develop learners' vocabulary or phonics" but open-ended apps "engage children more deeply and creatively in learning tasks". Closed apps are off-the-shelf apps which, in my study, were used mainly by

Ms Roberta. They allow active and meaningful learning but at the same time they "tend to follow a behaviourist or transmission model of learning" (Lawrence, 2018, p.210). Lawrence's description refers to the fact that many educational off-the-shelf apps employ a carrot and stick approach. While observing Ms Roberta, however, I could note that most of the apps provided activity-based learning and creativity to ensure that students acquire a full command on phonics. A hurdle I noticed was that while some apps (e.g. *Tricky Words 2*) could save information, like the pupil's performance, the teacher still had to go around and manually log that data. There was no way in which this data was linked to the Virtual learning environment, or any other Learning platform.

During my observations, Ms Yosanne tried to be more imaginative by creating activities with open-ended apps. Then again, however, the ultimate aim was to suit the syllabus. I noticed that, once they were properly used, both types of apps enabled children to memorise the material they had learnt when they were active in the process. During the feedback lessons, children recalled both when *Tricky Words 2* was used as well as when *Quizlet* was used. However, open-ended apps required more preparation time. During her interview Ms Roberta stated that:

> *Questions which need to be inputted by yourself absolutely require much more research; you have to create it so it is much more time-consuming and even the learning curve is higher, so there's a lot to do and the time we have is what it is, so planning takes a lot of time and there are a lot of things you need to do from your end beforehand.*

Another difficulty that emerged was pedagogical. Upon reflecting on the challenges of both closed and open-ended apps, I cannot but agree with Pegrum et al., (2013, p.70) who state that, "despite the number of apps available, teachers find that many have limited educational value because they are underpinned by information transmission or behaviourist drill-and-practice approaches". In my case study, however, I must acknowledge Ms Roberta's and Ms

Yosanne's effort to enhance the tablets' learning values and outcomes, since they were even disposed to adapt their way of teaching. When carefully used, in fact, closed apps enabled pupils to practise what they had learnt, and they were also encouraged to download these apps at home. At the same time, however, teachers could not just rely on closed apps as their main or only way of teaching.

What I deduced from my observations, therefore, was that tablets can be effective pedagogical tools as long as the teacher is disposed to encourage creativity.

4.4.4 Tablets are expensive to purchase and to maintain

My assumption was that tablets, as tools for learning, would not create more onerous financial difficulties for teachers than non-digital resources. At the time of my observations, teachers did not have allowances for school resources, since these allowances came into effect following the new sectoral agreement for educators in 2018. Teachers complained that the non-digital resources they created were very expensive. A glance at the classroom walls decorated with posters and charts, bears witness not only to the amount of work teachers put in but also to the money which is well-spent to embellish the classroom and create a welcoming learning environment. Stored in the classroom cupboards, apart from the tablets, I could also notice worksheets, flashcards and other non-digital resources. Ms Roberta told me that she herself had purchased the magnetic boards that I saw in Observation 13.

Throughout my research it also transpired that tablets are not only expensive to purchase but also to maintain. The difficulty of using tablets with young pupils was that the devices were fragile, and accidents were likely to happen. This was the main reason why tablets were used

in the computer room and were hardly ever taken out of this room. Ms Yosanne explained why tablets were not taken out of the computer room in her interview:

> *I believe there are plenty of things that you can do with them, like taking photos, hearing sounds, enhancing syllabi, writing and taking notes on iPads and tablets. However, there are risks. If they are damaged, what is going to happen? So, it is a two-edged sword, especially with Year 1 children.*

These concerns are similar to the ones described by Grant and Basye (2014, p.8) who outlined a number of difficulties:

- Tablet computers are an expensive experiment
- Students might break the handheld devices, the tablets might be lost or stolen, and replacement cost will soar.
- Increasing schools' technology capabilities is too expensive.

Tablets do require a substantial investment and 'St John Paul' was one of the few schools which financed or was sponsored with these hand-held devices. Eventually, they were securely stored in the computer room. In this case, wi-fi was only available in this room but in order to have anytime-anywhere access an upgrade in the school network system, including the bandwidth and access points, would be a must. Teachers told me that when using tablets elsewhere, they had to use mobile data (Ob1 diary notes) and this incurred extra costs for them.

4.4.5 Summary of the challenges of using tablets

The challenges posed by the use of tablets in the classroom are mainly the required shift in the teachers' approach to a more inquiry-based learning, which they felt took time away from the required syllabus, disruptions caused by these devices' portability, choosing the right apps and the risk of breakages and other costs. These challenges did not prevent the teachers from using tablets, but they did constitute barriers to practice that they had to overcome. As Ertmer et al.

(1999) suggests, teachers face a mixture of both first- and second-order barriers, and the means of addressing these must vary. This is an issue addressed in the final chapter.

The classroom observations made it clear that whilst the teachers had made great strides in embedding educational technology into their literacy curriculum, there was some way to go. In the next section, I address the extent to which the practice of the teachers in these two classrooms reflected the principles of the Charter for 21st Century Literacies (Burnett and Merchant, 2018).

4.5 Charter for 21st Century Literacies

Experimenting with tablets was something relatively new for both teachers even though they had already learnt how to make the best use of the interactive whiteboard software. Experimenting with tablets was a relatively new experience to them. At the same time, their particular interest was how tablets could help them. I considered the teachers' practices in relation to the Charter for 21st Century Literacies, in order to identify how far they were using them in ways which are identified by Burnett and Merchant (2015) as best practice.

(i) Acknowledge the changing nature of meaning making

There was extensive evidence of the changing nature of meaning making in this study. The way that the 6-year old children in my observations handled the devices shows that portable devices were used very extensively at home. My research concurs with Plowman, Stephen and McPake, (2010, p.422) who argue that "the home environment is changing as a result of

the rapidly growing presence of digital technologies" . For example, in one observation (Ob2 3-3-2016 MsR maincamera), especially when they seemed to gain more confidence with what the process entailed, most children were eager to help me film. The teacher asked Jane to be the researcher because she was "ready" from her task. Therefore, even for the teacher, this somehow became a new motivating ploy to encourage the children complete their classwork. Fig. 26 shows Jeffrey carefully handling the tablet to film the lesson.

Figure 26: Screenshot from Ob2 3-3-2016 MsR maincamera showing child carefully handling tablet to film session

This study corroborates the belief of several authors such as Lankshear & Knobel, 2013, who assert that literacies are changing. This study also suggests how open-ended apps can be utilised by children to express themselves and communicate their knowledge. After observation 12, Ms Mandy, the e-Learning support teacher explained how the app Drawing Desk allowed them to create their own media texts and artefacts using a number of different brushes and tools. Children could save and view a gallery of their own work. She also recommended another app, Educreations, and showed me (Ob12 Img9743) how students could write whilst recording their own voices. While she was explaining, in fact, she recorded her own voice, to demonstrate that this would have been an improvement to the lesson I observed.

During Observation 6b, Ms Yosanne tried to integrate literacy with healthy eating following an activity earlier on during the day to encourage good nutritional habits. Following the app "Żaqqinu jagħżel x'jiekol" she used Educreations to enable them join the lines. Fig. 27 demonstrates a number of pedagogical developments, which I consider as a significant change from the traditional classroom:

a) Children are using a tablet for a teacher-prepared activity.

b) Two students are working on the same device using Educreations.

c) They are helping each other by reading the words and thus there is an element of collaboration.

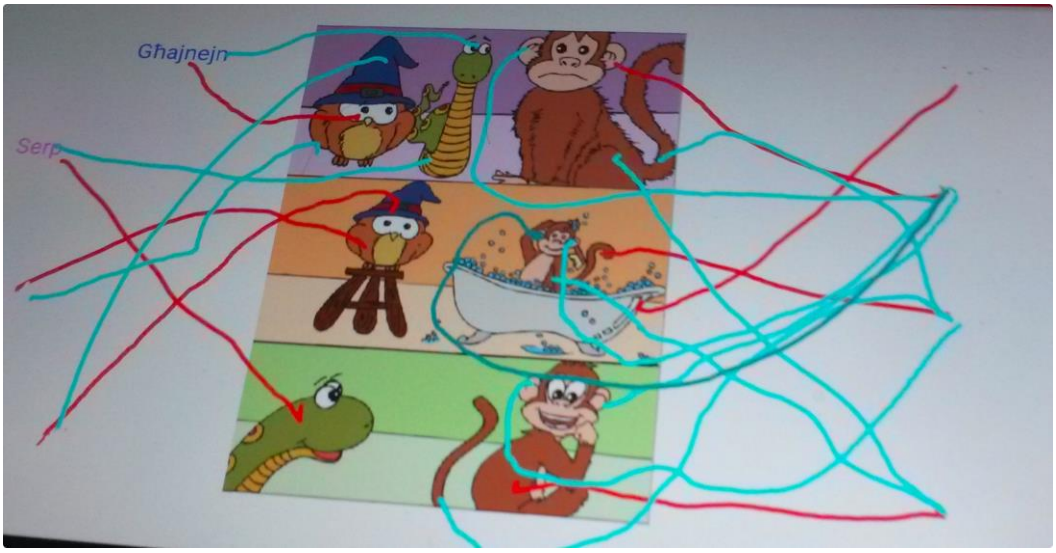

Figure 27: Using Educreations to join lines

But the Charter of the 21st century literacies also entails the provision of "contexts in which students can draw in open-ended ways across this developing repertoire: to combine and remix varied textual and linguistic practices within contexts that matter to them" (Burnett & Merchant, 2015, p.272).

This principle raises a number of reflections regarding the way tablets were used to enhance literacy skills in my observations. Tablets could be used to transform learning by enabling students to capture and document in images, text, voice, and video in a way which helps them improve their pronouncation, reading and sound-letter comprehension. Joining the lines was at the substitution level of the SAMR model. Children could take photos of real life objects or images as in Observation 1, insert them on Educreations and copy the word from the interactive whiteboard or projection of the teacher's tablet. They could also add their own voice to this annotated image in order to enrich their experience of reading and blending sounds.

Both the subject-focused app 'Żaqqinu jagħżel x'jiekol' and open-ended apps demonstrate that technology materiality is becoming increasingly embedded in the 21st century classroom. Interactions with technologies resulted in accomplishing various objectives in new ways. Burnett and Merchant (2019, p.29) state that curricula based on these new children's experiences is, "no different from any other form of learning". There was certainly evidence, therefore, that teachers acknowledged the changing nature of meaning making through their inclusion of tablets, but there is further work to do to ensure that this acknowledgement leads to pedagogical practices that are always appropriate.

(ii) Recognise and build on children's linguistic, social and cultural repertoires

During her interview, Ms Mandy argued that the classroom in this "digital age" is shaped by the fact that children are "digital citizens exposed to tablets and smartphones and so they are already familiar with some apps". Tablet learning, therefore, is built on children's experiences and from my observations it was evident that children appreciated this home-link; at school they were going to use tablets just as they do at home.

This evidence supports my epistemological and ontological assumption that knowledge is created among subjects seeking meaning through interaction and play using tablets, which are so deeply embedded in their reality. Fig 28 shows how Philip (like other children in this data-set) is very adept at handling a tablet.

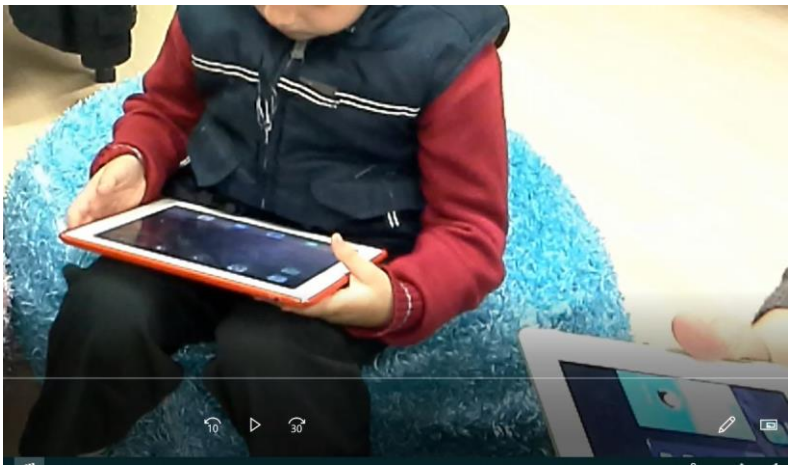

Figure 28: Snippet from Ob2 3-3-2016 Ms R children8

Teachers in my study did their very best to find apps which are suitable not only to children's language development but also to their understandings and interpretations of social contexts and life experiences. There were particular cases of images and words which were alien to children and definitely they did not "link to students everyday lives and cultural history" (Pahl & Rowsell, 2010, p.3). A screen shot from Ob7 29-4-2016 Ms R video 4.MOV shows that the classroom included artefacts which are relatable to children's cultural histories including religious symbolism, local weather and their own work. This was not the case in relation to the apps used, which included words that were unfamiliar to Maltese students learning their second language (e.g. the word icky in Observation 3, See *Fig. 29*).

Figure 29: snippet from Ob3 9-3-2016 MsY ipad 1

Most of the lessons were too shallow and narrowly focused on the syllabus i.e. words that they have to learn in their syllabus. Multiple modes in this study enabled students to explore, create and convey meanings (Burnett and Merchant, 2015). Further development is required so that there will be more classroom activities that allow children to "develop their interests and to integrate their learning in a meaninfgul way. This is a central feature of effective education" (Burnett and Merchant, 2018, p.32), but I am not sure to what extent teachers could, in this study, stray away from the rigid, structured curriculum.

(iii) Acknowledge diverse modes and media

Various authors (Kress, 1997; Lancaster, 2013; Flewitt, 2008) have shown how children use diverse modes to create meaning. The apps that were used in my study were multimodal because they required different modes, including a combination of sounds with pictures, to be used to make meaning. This excerpt from Observation 13 shows how children could convey meaning through combinations of audio, visual and spatial modes;

Can you see something in Blue?
What can you see in Blue?
At (maltese pronouncation)
No, it's in English. So what does it say?
At

So here at the side on the left we have some pictures and they all end with at; they rhyme.
So go on the cat.
Well done.
So can you help me?
How do we write cat?
(Children pronounce CAT)
Let's take a picture of the cat
Did we spell it right?
C a t

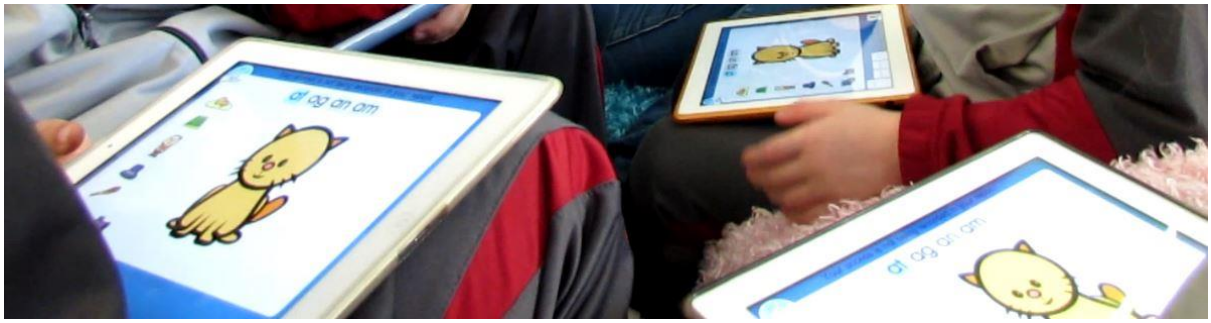

Figure 30: Snippet from Ob6 13-4-2016 MsR video 2

Fig. 31 shows Lesson 11 with Ms Yosanne, where children used diverse modes such as the camera colours etc. As in Plowman, Stephen and McPake, (2010), it was evident that technology is enabling young children to combine and transform their visual expression.

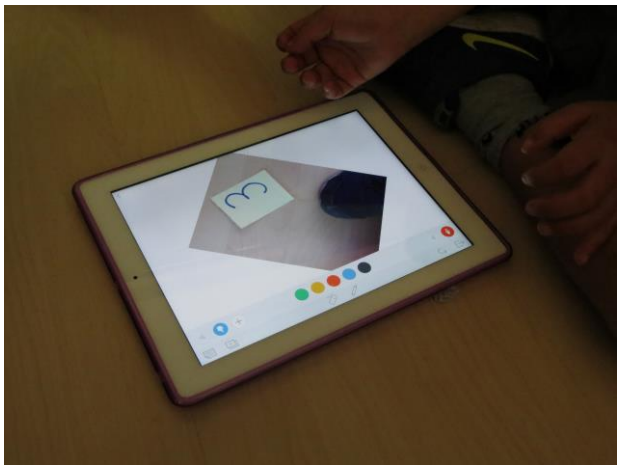

Figure 31: IMG_7876

Neumann & Neumann (2014, p.232) describe tablets as "interactive multimedia displays that stimulate visual, auditory, tactile, and kinaesthetic sensory systems and respond to a child's input with instant feedback". This study shows how tablets have certain affordances, such as portability, haptics and sounds, which offered the possibility for children to express themselves effectively with different modes of communication in different contexts. As stated earlier (e.g. section 4.3.3), tablets were used far more effectively than other digital resources. During observation 7, for example, children were asked to read static pictures displayed on the interactive whiteboard. Tablets enabled them to use the camera and take pictures of items prepared by the teacher. Subsequently, they could import the images into Educreations and even create a screencast by recording their own voice reading the word.

I adopted the mapping of textual repertoire (Burnett and Merchant, 2018 p.39) to show how tablets enabled informing, imagining, interacting and presenting (Table 5).

Table 5: Mapping of Textual Repertoirs

Informing	*Educreations* on the Whiteboard during Observaton 1	Writing Still Image
Imagining	*Drawing Desk* during Observation 12	Colours
Interacting	*Educreations* on the Whiteboard duing Observaton 11	Writing Colours
Presenting	Media Player (Apple TV) during Observations 14 and 15	Video Quiż
Narrating	*Educreations* Observation 9	Camera Colours

Educreations on the whiteboard during Observation 1 allowed students to inform each other . Another solution, which would probably require project-based learning, could have been'*Story Jumper'*, which would enable them to create a book.*Drawing Desk* had a number of colours and a variety of brushes. During Observation 12 (Fig. 32), the children were asked to draw an image as instructed by the teacher, such as a 'boy'. Other children, eventually, had to write down the word.

Educreations, during Observation 11, enabled the pupils to interact with each other. They had to count the marbles and take photos of the numbers, insert the picture on Educreations and then write down the word.

Figure 32: Snippet from Ob11 20-5-2016 Ms Y video 6.MOV

The Media Player (Apple TV) was used more than once during my observatons. During Observation 14 Ms Yosanne enabled children to display their achievements using '*Tricky Words'*. During Observation 15, Ms Roberta used the Apple TV to present the quiz through '*Zaption*' (Fig. 33), based on the video created earlier on by Ms Mandy.

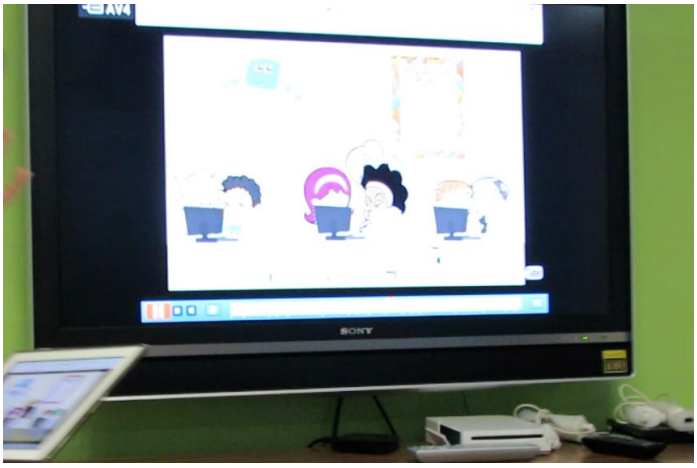

Figure 33: Snippet from Ob 15 1-6-2016 Ms R 8

During Observation 15, Ms Roberta also made use of narration in order to teach words and sound names in Maltese. In another example (Observation 9) Ms Yosanne preferred to narrate the story hereself whilst she encouraged the children to draw. Figure 34 shows the collage of scanned words created by the teachers, enabling her to tell the story. Unlike children's printed workbooks, this is an example of non-linear and multi-directional form. The story itself started with the photos of the words which were scattered, and there was no particular order in how the photos were captured.

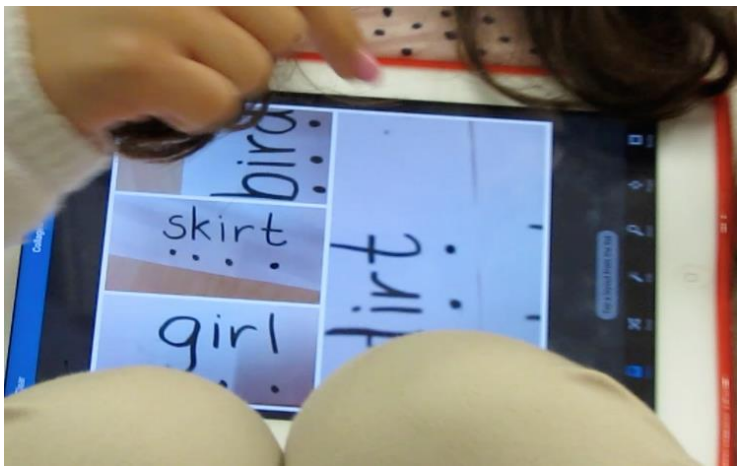

Figure 34: Snippet from Ob9 11-5-2016 Ms Y video 7.MOV

Children could interact with the story by using *Educreations* and drawing the word as in Figure 35.

Figure 35: Snippet from Ob9 11-5-2016 Ms Y video 9.MOV

These examples show that providing teachers with diverse modes to make meaning may enhance literacy learning.

(iv) Recognise the affective, embodied and material dimensions of meaning making

This principle helped me delve deeper into the material dimension of literacies, such as the scribbles using *Drawing Desk* during Observaton 12 and the story prepared by Ms Roberta using *Goanimate* during Observation 16 by taking snippets from a *Youtube* video created by Ms Mandy.

Burnett and Merchant (2013) argue that:

> Literacy is deeply implicated in any consideration of technology and childhood, particularly since the rapid adoption of new practices in everyday life is closely tied up with meaning making and communication, predominantly, although by no means exclusively, through the use of lettered representation. (p.1125)

In the previous sub-section I mentioned that the way children hold tablets and their control movements show that tablets are part of their lives. In this study, tablets have expanded the

affordances of multimodal communication. Burnett and Merchant urge us to build upon the children's own experiences in order to address their educatonal needs.

This principle, however, also urges us to better understand the embodied experience of students, the semiotic modes along with the nature of 'materiality/immateriality' (Burnett et al. 2014). The children's bonding with tablets provides insights into how children interact with tablets and how they perceive them. Tablet instructions are not perceived by children differently from adults' instructions and they almost attribute human characteristics to them:

> *"but it is telling me 'ng' only"*
> *"Miss, but it is telling 'ing' only"*
> *(Ob10 11-5-2016 Ms R video 4 translated)*

Despite this bonding and this level of confidence with the device, which is also developed in their home environment, I notice that children in my database encountered what Burnett and Merchant (2013, p.1136) describe as "counter 'schooled' approaches to literacy". Regrettably, most of the lessons were merely focused on aspects of the syllabus and remained distanced from the children's life experiences. During other lessons, the tablet was used for a totally different purpose (e.g. revision of letters and sounds during Observation 4) than that of the first part of the lesson.

As in Burnett and Merchant (2018), in my studies I noticed that when children used closed-ended apps, they worked more individually since these apps promote more autonomous learning. On the other hand, open-ended apps enabled pupils to team up with each other (See Fig. 13). Nevertheless, the key to encourage students to work together is the teacher's approach. During observation 14, Ms Yosanne managed to get the children to share their own work despite the fact that it was a closed ended app (Tricky Words), as shown in Figure 36.

Figure 36:Snippet from Ob 14 1-6-2016 Ms Y 7.MOV

Drawing on this principle, I suggest that activities should be linked in a visible web of physical and digital media forms. The embedding of tablets in teaching should not be different from the ubiquity of mobile devices and the seamless integration of technologies in daily life. If we ensure that this personalised anytime-anywhere learning is in place, our pupils will be able to develop the 21st century digital competencies they will need in the future, both for their workplace and for their daily lives. This will enable a sufficient focus on the affective, embodied and material aspects of the use of tablets.

(v) Encourage improvisation and experimentation

The findings of this study indicate that tablets can allow for improvisation and experimentation, but there was limited evidence of this. It is an aspect of practice that needs to be fostered in the Maltese context, where a formalised approach to learning and teaching is the norm.

I draw on Burnett and Merchant (2018, p.62), to analyse the current extent of improvisation and experimentation and how they can be improved. The models in the chart (Table 6) are discursive approaches to understanding digital interactions and ways of interpreting changes

in literacies. Tablets in my studies were used in combination with other digital and non-digital resources. This is similar to Heydon, McKee & Daly, (2017, p.369), for instance, who propose a combination of tablets with a number of applications and network connections "in relation to a plethora of other media such as paper, paint, pencils, charcoal, all within the context of a curriculum structured through pedagogies to support the acquisition and amelioration of people's facility". This also allowed me to establish whether the affordances of tablets allowed for improvisation and experimentation compared to other media which were used.

Table 6: Chart indicating how improvisation and experimintation can be improved

Children's ideas and interest	Variety of media	Different range of textual forms	Individual and collaborative engagement
In observation 13, they could play with plastic letters. This part of the lesson was not linked to the tablets lesson.	During Observation 14 they displayed their content on the interactive whiteboard and made use of a big screen.	During observation 9 *Drawng Desk was used***.**	During observation 8,individual learning using tablets seemed to hinder teamwork. There was no sharing of resources, colours and ideas as normally expected when students use non-digitla media.
During Observation 7 and 12 they could draw using Educreations whteboard.	*Educreations* during observation 12 allowed drawing	*GoAnimate* was used in the preperation of a video. *Zaption* was used to create a Quiz.	During Observation 7, children sang with the *Centopied* Video.

			It was quite engaging.
	Observation 11 using camera facility and *Educreations*	During Observation 12, the pupils were instructed to write the word described on the big screenon the tablets(see and write).	

Tablets, together with other media, provided opportunities to make learning more engaging through new ways of teaching by allowing pupils to draw and share, as shown in Figure 37.

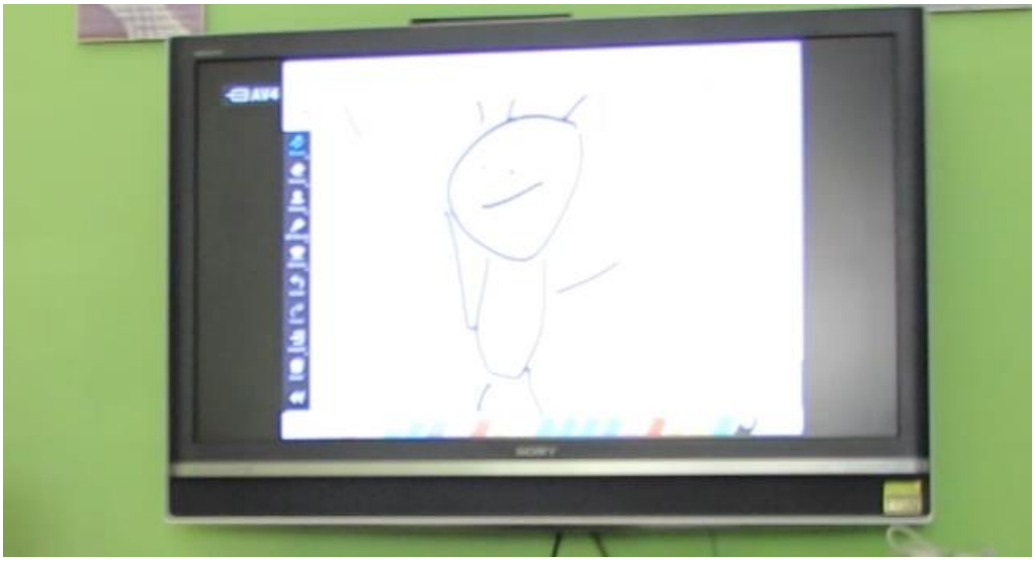

Figure 37: Snippet from Ob12 25-5-2016 Ms Y video 6.MOV

The teachers in my study capitalised on the affordances which tablets could provide for exploration. An improvement would have allowed more creative engagement, which is

"unplanned and emergent in nature" (Burnett and Merchant, 2018, p.4). Skill acquisitions were emphasised rather than fun.

(vi) Use playful pedagogies

Since the classrooms observed were those of early years children, indoor and outdoor play were part of the daily schedule. However, children were looking forward to tablet lesssons and this was perceived, even by their teachers (e.g. Interview with Ms Roberta), as a different and innovative way of learning. Tablets enabled teachers to teach key content through stimulating interactions and active, playful learning experiences.

Ms Roberta, during her interview, stated that apps stimulated children to learn subconsciously. She also mentioned the advantages of an informal classroom setting and sitting on cushions. While playing, the pupils were also learning and building those foundational skills through a fun, enjoyable and engaging experience. Apps allowed them to proceed until they inserted the correct answer, and this enabled them to gain perseverance and risk-taking skills. Ultimately, she asserted, they will just keep remembering the fun.

Ms Yosanne, during her interview, also confirmed that:

> *Definitely, by using tablets I could do several activities, memorisation through games, help them with what they have learnt and difficulties encountered and further to this I used to take them out of class so they wouldn't remain in a table and chair environment, but rather they would do something else. They would be free to walk, see, learn by means of the camera, take photos and so on and so forth.*

Qian and Clark (2016) argue that there is no strong evidence that game-based learning can actually improve learning or that it can develop 21st century competences. However, they found out that "design-based games tend to work better than simply having students play educational or entertainment games" (p.56).Burnett and Merchant (2018, 71) argue that rather seeking to structure, we need to leave room for improvisation and open-ended approaches.

In this study, the games used were either created by developers for education purposes or by teachers themselves. Fig. 38 shows *Quizlet,* which was prepared by Ms Yosanne and observed during Observation 5.

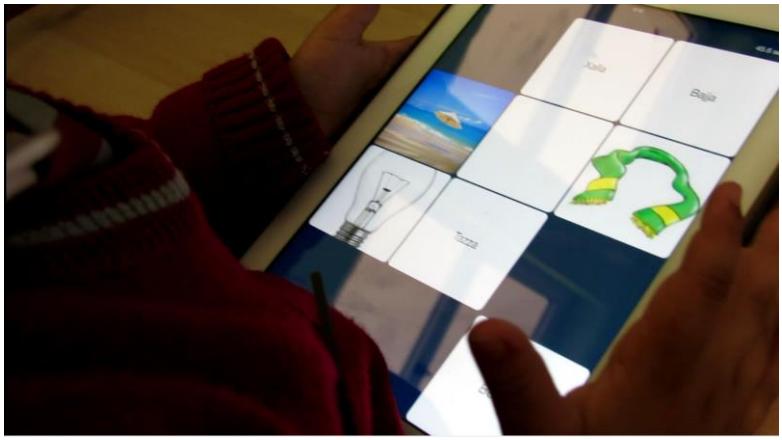

Figure 38: Snippet from Ob5 13-4-2016 MsY video 5.JPG

'Żaqqinu jagħżel x'jiekol' (Figure 39), observed during a healthy eating activity (Observation 4B), had a camera feature activity which allowed children to find healthy food. Unfortunately it was a spurious camera and it did not allow the saving of photos.

Figure 39: Screenshot of Żaqqinu jagħżel x'jiekol where child correctly chose a banana as healthy food.

Despite the more 'controlled' type of games, the fact that the classrooms were so small was always a big advantage. Burnett and Merchant (2018, p.66) acknowledge that "giving children free rein could mean losing control". Playing is synonymous with discovering, experimenting, exploring and interacting, but these require classroom management strategies that need to be studied.

Another aspect of this analysis is whether tablets facilitated playful pedagogies. Children definitely enjoyed learning through tablets. They facilitated many games. At the same time, technology-oriented tools should not imply the exclusion of non-digital ones, as stated by Kucirkova (2014), who also debunks the myth that technology in the classroom should be the driving force behind educational change. Ms Roberta, in her interview, stressed the importance of other digital and non-digital tools:

> *The fact that this is a Year 1 class of children between five and six years, for them the sense of touch is very important. So, in my opinion, I think it was important that they see and feel different materials and textures. There were moments where we used the magnetic boards, other moments where we used plastic letters so they can feel different materials. However, the idea of the lesson was to incorporate all these together. It's not just the tablet or just the hands-on activity but we joined them all together in order to make them realise that you can learn about one thing in many different ways.*

To sum up, this study concludes that playful pedagogies require curricula that encourage play-based learning that helps to develop creativity, critical thinking and empathy, rather than focusing on just formal approaches to the teaching of literacy.

(vii) Create opportunities to work with the provisionality of digital media

The teachers' willingness and their genuine interest to use tablets evidently show that they wanted to exploit the provisionality of digital media in the support of effective learning. My

study shows that tablets, as digital media, extend the range of semiotic resources available since they integrate the sense of touch and the use of sounds with the text. Fig 40 shows *Twinkle Phonics Phase III* during Lesson 10 with Ms Roberta, which clearly expounds the affodances of digital media over non-digital resources (e.g. books, worksheets), where children can neither select correct anwers nor practice spelling words phonetically.

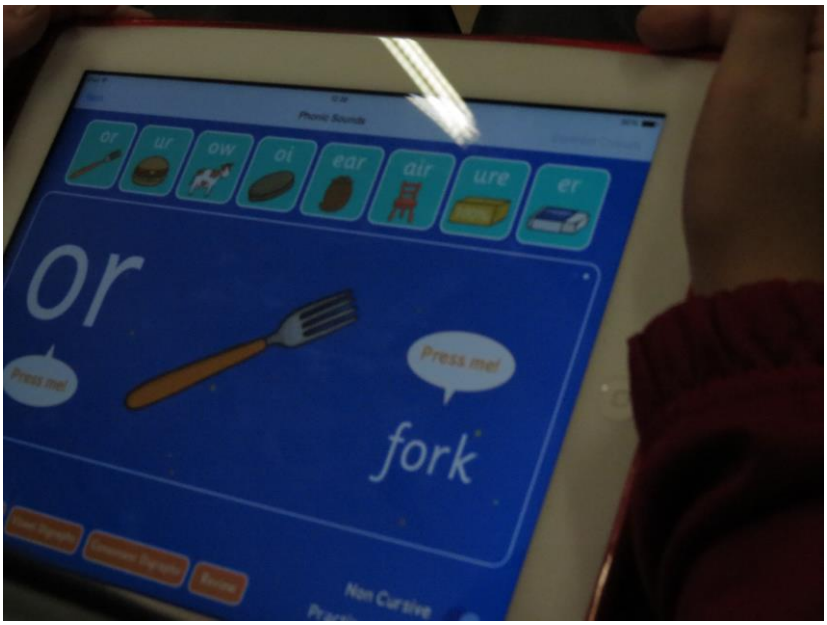

Figure 40: IMG_7208.jpg

Tablets offered a number of possibilities for multi-modal texts. The main research question of this study was about the affordances of tablets and how they expanded the learning experience by making it more engaging and immersive. Teachers in my study found that the sheer number of education apps overwhelming (as in the Interview with Ms Roberta) and not all apps are relevant to their teaching and the age group of children. However they found a small number of apps that worked for them and during this study they were used more than once. 'Educreations', for instance, allowed students to embed audio and pictures. Ms Yosanne was planning to create a story-jumper book as part of her activities based on the story of '*Elmer the Elephant*'.

Nonetheless, the volume of content in the teachers' curricula was problematic. This required a lot of time which was not available. However, we need to ensure time is made available. Burnett and Merchant (2018) urge us educators to revist our teaching in a context in which literacies are continuously changing, because otherwise the curriculum would have little relevance to their current or future lives.

It should be noted that although they were not used during the lessons observed, teachers were aware of the new books produced by the e-Learning Centre with allowed augmented reality – another technology which demonstrates the provisionality of digital media and can be implemented by portable digital devices.

(viii) Provide contexts that facilitate critical thinking

Teaching critical thinking is a crucial step to stop fake news and its effects. The mapping of media literacy practices and actions in eu-28 (Council of Europe, 2016) reports that the approach to media literacy in Malta is fragmented and no formal or informal network exists. During my observations, the children did not have access to internet and browsing in a safe environment was not carried out.

The development of critical thinking in children was limited to what was described as the "coding lesson" and "computational thinking", although the latter has a much broader definition. The use of tablets was restricted to Code-a-Pillar (Fig. 41). In this game, the caterpillar has to eat the right number of leaves and fill up his belly for the next challenge. The learning outcomes of this game were problem-solving, planning and sequential thinking. In this lesson, Bee-bots and light table were also used.

Figure 41: Screenshot of Code-a-pillar during Observation 11b

This study concurs with Marsh (2015, p.37) who argues that, "Apps that embed problem solving, critical thinking and abstract-reasoning activities are more likely to promote creativity". There are not a lot of examples in my study where children are enabled to create rather than just consume content. Teachers always emphasised that repetition is important for early years literacy. Tablets fulfilled their purpose in this regard, as shown in the sections above. However, I believe that teachers need to break away from these drill-and-skill programmes. Tablets, in fact, could have been used more to involve user-generated content so that students can develop critical thinking. Another reflection that emanates from this study is the fact that critical thinking is being taught as a descrete area (as in Observation 11b) rather then being embedded in other areas, which children may find interesting. A further improvement would have been to seamlessly integrate the learning outcomes of literacies (as broadly defined) in a single project in order to promote unfragmented teaching and learning in a context that would be relevant to children's interests. In this scenario, children could avail themselves of innovative technologies to engage in digital literacy activities and critical thinking processes through the effective use of language skills, while engaging in different activities which help to develop their expressive

skills, document their experience and share with colleagues. On these lines, Ms Mandy suggested a search and rescue exercise where blue-bot, controlled by the tablet, can search for Orsinu the teddy bear. This lesson, however, did not take place during my observation period.

(ix) Promote collaboration around and through texts in negotiating meaning

Collaboration is a 21st century digital competence. I hail from the Information Technology area and software development is one of the industries which requires collaboration and working on different modules. Burnett (2016, p.567) states that:

> If educationalists are to capitalise on opportunities to use digital technologies to support collaboration in schools, there is a need for a nuanced understanding of how children and young people relate to one another in and around virtual environments in classrooms." (Burnett, 2016, p.567)

As stated earlier on, tablets seem to promote more individualistic working. During observation 9, for instance, children had a full range of colours and all the required tools, but they worked individually. What hindered collaboration, however, were not the tablets themselves but the way they were used for autonomous learning, with a very narrow focus on learning.

The use of Apple TV (e.g. Observation 12) was very engaging and it allowed students to display their work. A collaborative tool such as Padlet would have enabled further collaboration and a shared board on which students would have interacted with each other while being taught how to participate.

Thus, I draw again on Burnett (2016) to analyse whether children in my study were being provided with opportunities to experiment and learn from each other by "working together" using tablets. Regrettably, even in this regard, children were left to learn on their own only

when they used closed apps that allowed some sort of self-testing. The lessons where they used open-ended apps were often more controlled by the teacher and this hindered the pupils from working together. As a matter of fact, I had little opportunity to observe them working together. The best example of observed collaboration was the first lesson with Ms Yosanne where the children worked in pairs and took pictures of objects starting with "ch". In this lesson, the children showed that they could use writing in both manuscript (handwritten form) and digital form in order to inform other people. They also learnt how to use language to present the words they wrote logically and clearly and talk to engage an audience, while analysing and evaluating through an open-ended approach. Another learning objective reached was using spoken language to share their ideas in a collaborative way, appreciating the social elements of conversation such as waiting for their turn and listening to what others have to say.

4.6 Conclusion

This analysis has garnered various perspectives from teachers and pupils alike in terms of their use of tablets within an educational setting. In my observations, the affordances of tablets to teaching and learning enabled teachers to reach outcomes which otherwise might not have been possible. Tablets also enabled pupils to acquire several competences such as capturing photos, video-recording, writing and drawing, all of which were embedded in one portable device. The quizzes created by the teachers as well as the self-learning activities, called for the pupils' constant attention and this engagement in itself induced the acquisition and improvement of several skills. As stated in the introduction, the focus of this thesis is on the implied pedagogy rather than the technology itself. Technology changes rapidly and some features may also improve. Some of the apps analysed may also have changed since the beginning of my research. But the main focus of this analysis was how apps could help teachers to engage the

pupils in their learning and to make the learning accessible, relevant, and enjoyable. Ms Roberta, Ms Yosanne and Ms Leanne, with the support of Ms Mandy, were eager to explore the contributions of this tool to teaching and learning and to consider how they can adapt their methodology in order to maximise the benefits. Moreover, tablets facilitated self-learning and induced a learner-centred approach, which also improved the dynamics of the classroom. The classroom layout was different from the traditional layout typically found in the usual classroom. Children sat down on cushions scattered on the floor and they moved around freely.

Admittedly, there were also hurdles to overcome, such as the financial implications of teachers having to buy more apps. Another issue was that wi-fi was only available in one room. In addition, one should consider the aspect of portability which, at first glance, might seem totally beneficial, but in practical terms it also poses the risk of mishandling leading to damages. All in all, however, the tablet proved to be a very effective and powerful learning tool as long as it was combined with other educational resources, including non-digital tools. At the heart of all this, there is the human being with its unique ability to adapt, to change, to discern and to create: there is the teacher and the pupil without whom any technological advances would lack their ultimate trajectory - our educational wellbeing. In the final chapter, I consider the implications of the study for further research, policy and practice.

Chapter 5:
Conclusions and Recommendations

5.1 Introduction

This chapter outlines the implications of the findings, considers the strengths and limitations of the study and provides suggestions for future research. This study debunks the myth that tablets are a quick solution to all education problems. At the same time, it aimed to address the concerns of some educators and parents that using the tablet from a relatively young age is sinister. The study indicates how tablets can enable students to engage in learning through games, animated movies and relevant activities in the classroom.

In this chapter I will first share the key empircal findings, outlining how the findings relate to literature in this area. Furthermore, I will propose the 'Charter of the 21st Century Literacies' as a set of principles which can help to enrich and support Maltese teachers in tablet learning. Subsequently, I will outline my recommendations in terms of future research in educational practice and policy. Finally, I will describe what I believe are the strengths and limitations of the study presented in this thesis and outline the contribution of this study to the field.

5.2 Key Empirical Findings

The first question that this thesis tried to address was:

How far are tablets creating new affordances for literacy learning in the Maltese context?

This study's key empirical findings confirm that tablets enable educators to create more innovative and creative lessons, increase motivation levels in students and promote e-inclusion in classrooms. The intuitive touchscreen, simple controls and several built-in features make it easy to use with young children. This seemed to increase the students' motivation, which is

"influenced by learners' sense of agency and feelings of mastery and control over the learning activity and their interest in it" (Lo and Hyland, 2007, p.220). Tablets seem to increase this motivation (Dunn & Sweeney, 2018, p. 860).

During my observations, tablets instilled enthusiasm in the students, and they were very much looking forward to these lessons. This augurs well for the students' educational development, since it is a practical way to introduce them to multiliteracies at a very young age. Despite the fact that children in my data set did not create and produce with tablets, as in the study by Laindlaw and O'Mara (2011), their scribbling on the screen was also their way of expressing themselves. This was possible thanks to the touch screen facility which allows not only visuals and sounds, but also haptics. Some authors, such as Santori and Smith (2018), argue that tablets can create 21st-century learning opportunities by empowering students to develop multiliteracies in productive and innovative ways. This was the case in my study as, for example, children took photos and added them to *Educreations.* These functionalities make tablets great tools for multi-modal text production and analysis. This study revealed that tablets were quite effective to promote self-learning. This was generally consistent with literature, as in Prain et al. (2013), who argued how personalised learning approach could improve the students' academic achievement. In my research, however, tablets were only used to re-inforce what students had already learnt and there were no set milestones or goals when tablets were being used. Tablets definitely facilitated learning for students like Jennifer, who had a hearing impairment, by allowing personalised learning tailored to her needs. They were also beneficial for John, who used to struggle with learning, by enabling him to gain more confidence.

This study shows that tablets have the capacity to be used for both personalised and collaborative learning. Unfortunately, collaboration was limited to the first lesson, although

teachers collaborated a lot with each other. Much of the related literature e.g. Clark and Luckin (2013) focuses on social media apps aimed at older children and young people, and therefore is not relevant to young children. However, some authors also identified the advantages of tablets when it comes to collaboration within a school because, "...they are easy even for small children to carry" (Pegrum et al., 2013, p.74). During my observations, children also had some flexibility and the classroom did not have fixed desks. Kucirkova (2014) also refers to the fact that tablets are keyboardless, and this was an advantage to young children in my study.

The themes raised in my literature review and empirical research describe different pedagogical affordances, but it is important to note that they are also linked. Portability facilitates collaboration as well as personalisation. Autonomus learning increases motivation. The ease of tablet usage allows the students to take photos, annotate their photos and they can possibly create their own content. This makes tablets excellent learning tools.

Laurillard (2004, p. 27) argues that, "none of the new technology media was developed as a response to a pedagogical imperative, and it shows." However, this is not anymore the case with tablets. Many apps were designed for learning and to make good use of the hardware functionalities such as the touch screen. Using just one device, a student can read, write, play and take photos. One tablet can have a number of free books. This makes it affordable for some working-class families, as in the case of my empirical research. Working class children are then empowered with ICT competences, such as taking photos, which would be more difficult without portable devices. Working class children are then also virtually given opportunities to download literacy apps, just like children from a highter social class. Even if some and apps require payment, quite often the price is much less than that of traditional books. However, it should be acknowledged that even though children from lower socio-economic groups might

own tablets, they are sometimes low-cost versions that are not as effective as tablets owned by children from higher socio-economic groups, and such matters as limited battery life can impact on quality of use. In addition, there are children in families with limited economic capital who do not have access to tablets or other devices, or if they have devices, they may not have access to broadband (Marsh, Murris, Ngambi, Parry, Scott et al., 2020). Further, children in middle-class families are often given access to educational apps and games, which orientate them to school life, wheras working-class children may have greater access to 'edutainment' software (Livingstone and Haddon, 2009). Therefore, whilst technology may appear on the surface to be a leveller, in practice it can exacerbate exsisting societal divides between children of different socio-economic groups (Selwyn, 2016).

In addition to all of these opportunities of tablets, the teachers in my study also discussed some of these difficulties. These constraints related to the second research question in this thesis:

What are the challenges of using tablets in the classroom?

The teachers' lack of confidence in terms of tablet usage was one of the main limitations in the embedding of tablets in the classroom. The difficulties do not necessarily stem from the lack of teacher competences regarding how to use tablets, but relate to the question of how to integrate them into their teaching and learning (Christensen & Knezek, 2017). Since tablets in education were relatively new in the Maltese islands, the two teachers in my study were among the first educators in Malta to use tablets enthusiastically for teaching and learning. They were supported by the e-Learning support teacher Ms Mandy, but tablet-mediated teaching was a new experience for her also. Teachers also had to adapt to the rigid syllabi, which were based on grammar learning objectives. The barriers to using technologies in the classroom identified

by Ertmer et al. (1999) were crucial to this study and helped me understand in greater depth the difficulties faced by teachers in my empirical research. Limited internet bandwith, lack of wireless access points in class and the ownership of a limited number of devices were amongst the difficulties faced. In addition, teachers did not have the right infrastructure for assessment for learning because students could not document their learning, as proposed by Christensen & Knezek (2017, p.381). Assessment for learning may entail keeping a record of the students' work. Not all apps have this functionality, as in the case of my observations. There are some cases where teachers may require the full version rather than a freeware, so this may incur extra costs. The promising advantages of portability are also coupled with the limitations of the hardware, such as a lack of USB port, and, in addition, challenges for teachers in monitoring what the students are doing.

In line with the literature (e.g. Diaz, 2017), the teachers I observed in Malta were concerned about breakages and misuse of the devices by children. Even if apps come at a very reasonable price, ultimately, what the children have in their hands is an expensive device. In addition, content creation using open-ended apps seemed to be daunting to teachers initially, but in the end Ms Yosanne found it rather rewarding.

The positive experience of learning while playing, self-testing and listening to phonics appear to be the main motivation for using tablets in the classroom for literacy learning. However, what I deduced throughout my research and writing process is that a blend of digital and non-digital resources should be used for effective learning. Meanwhile,the role of the educator is far from being challenged because of these emerging technologies. Teachers were the ones who researched which apps reach best the learning outcomes of the lessons and this also

entailed preparation for the delivery of the lesson. The teachers' explanations, good use of voice and body language were also important elements of the lessons observed.

The findings of this study indicate that teachers were keen to make use of the affordances of tablets to teach in a fresh, exciting way. Tablets opened up new horizons, but at the same time they required a broader and new set of competences than before. I deepended my reflection by drawing on Burnett, et al., (2014) and examined how the 'Charter for 21st Century Litercies"' (Burnett, et al., 2014) can identify pedagogical focus areas for the integration of tablets into literacy teaching and learning. The third research question, therefore, was:

How far are the principles of the Charter for 21st Literacies (Burnett and Merchant, 2018) evident in teachers' practices with tablets in two Maltese classrooms?

The third research question is related to the 'Charter for 21st Century Literacies"' (Burnett, et al., 2014), which is a framework which can help Maltese teachers develop their teaching. It is also envisioned that such principles could be used to structure tablet-mediated teaching and learning programmes. The main findings in relation to each of the principles were as follows:

(i) Educators have to acknowledge that the digital and non-digital are two realities that reframe children's daily lives and they are able to seamlessly move from one mode to the other and from the material and "immaterial". Literacy is not about reading and writing only because there are various other literacies like media literacies and music literacies which need to be taken into consideration. The argument that Burnett and Merchant (2018) put forth is that the definition of literacies should not be restricted to making meaning using alphabetic script, but

that even literacies themselves can change. Digital literacies are important to enable us to analyse critically online content, create, communicate and collaborate. The uses of tablets in my study show how these devices enhance children's learning and also enable them to hone the skills they need in today's society, such as when they took photos and used the app '*Educreations*'. Teachers in this study, therefore, recognised that literacy was indeed being transformed in the digital age.

(ii) Educators have to acknowledge that the linguistic repertoires are valuable cultural resources. In this study, I developed a profile of each participant. This was an important starting point for child-centred education. Children told me that they had tablets at home which they used to watch their favourite videos (*Peppa Pig*, *Dora the Explorer* and *My Little Pony*). It was evident that many of them were comfortable using tablets. They identified with their favoruite characters and they also associated lesson items with them..

Despite the growing awareness of children's capabilities, Burnett and Merchant (2018) emphasise "the need for careful observation and identification of children's understandings and practices with new media, partly because these are so rich and varied" (Burnett and Merchant, p.33). This study reinfroces the point that children should be given ample opportunities to express themselves. The teacher also needs to attend to learners and their environment and also connect them with content in meaningful and purposeful ways. Barnard (2011, p.5) states that "alternative texts are needed" to engage students who "struggle while reading print-based texts". Acknowledging diverse modes and media, therefore, is essential to the educational well-being of our students. To some extent this is present in this study, but, as I have indicated, the impetus for building on children's own 'funds of knowledge' (Moll et al) came from

myself. There needs to be further attention paid by teachers to this. In addition, the study indicates the potential of tablets for supporting children's first language development, but for this to take place, high quality apps need to be developed. .

(iii) Educators have to acknowledge the diverse modes of communication and representation. Kucirkova, Rowe, Oliver, & Piestrzynski, (2019, p.7) argue that:

> Multifunctionality of new technologies implies that they can be used for writing a story but also for adding photographs, digital drawings, hyperlinks and audio recordings to the written text. It is this multimedia quality of digital texts that might add value to children's writing experiences. Current research taps into this potential by focusing on multimedia story-making apps but future research needs to take this focus a step further by specifying the individual stages children move through as they compose on and off-screen. (p.7)

This entails the combination of digital with non-digital learning, which can be both used to improve student engagement and their literacy skills through various modalities, as is demonstrated in this study. Through the use of a wide range of modes and modalities, children are able to develop a range of knowledge and understanding. In addition to being equipped with digital competences, teachers also need to find ways in which technologies can be inextricably linked to their teaching. This study indicates the urgent need for a multi-modal curriculum in Malta which "comes from an understanding of literacy as multimodal" (Heydon, McKee, & Daly, 2017).

(iv) Educators have to acknowledge the affective, embodied and discursive literacy practices of their students. Burnett and Merchant (2018, P.47) define affect as the feeling "generated among – or in between – those present". They show how technologies are used to support multimodal meaning-making in which affect is key. This principle requires that educators explore the meaning-making practices of children through apps. Burnett and

Merchant (2018, P.49) argue that, “this discussion of affect has implications for thinking about how we support children as they collaborate with one another”. In this study, children used tablets to write words and they shared their work using a media-player which allows streaming and content sharing. This contributes to strenghtening relationships and enabling children to engage their feelings and emotions in their classroom work.

(v) Educators should create a safe environment which allows improvisation and experimentation. This study shows that the benefits of tablets in teaching and learning are undoubtedly enormous, not only from enhancing the lesson but also from the point-of-view of, developing every student’s potential. Students have a portable learning device by which they can express themselves, learn and search for information. As I suggested in the previous chapter, there was limited improvisation and experimentation observed in this study because of the focus on the syllabus. In addition, there was not a focus on safe use of the internet. This is important, as apps that do encourage improvisation and experiementation, which it is hoped children enocunter at some point,

The analysis of this study shows that although many students are capable of using tablets from home experience, during lessons, they were shown a number of learning tools which they might not have been aware of when using tablets on their own. Students were exposed to a number of closed apps and open-ended apps which, from the time of these observations, became incorporated as part of their pool of favourite tools. My interpretation is that there is a difference between having a good mastery of software and hardware, and mastering a set of core competencies, which includes creativity. During my study the use of internet was limited to the apps being used, however when children are at home, internet use poses a number of risks, which, must be attended to and managed. 21st century digital competences entail that

our students should be equipped to identify the challenges that come along with internet use and reflect on the responsibilities they have. Teachers, parents and carers should strike a good balance between allowing a certain amount of freedom, independence and adventure, while at the same time their role should not be too rigid but rather, helping them to self-regulate.

(vi) Educators have to shift to play-based learning approaches which support 21st century competences like collaboration and creativity and keep children engaged. Burnett & Merchant (2018) acknowledge that there are challenges in using digital media in playful pedagogies. There are some perceived risks since play is "unruly, unpredictable and sometimes subversive". However, they also state that, "the payoffs in terms of earner engagment and enjoyment are considerable" (p.74). To a limited extent, playful pedagogies occured in this classroom. For example, QR codes during observation 4 enabled some form of play. Play could also be extended by physical activities, such as playing 'Passju' (the traditional Maltese version of hopscotch.) Therefore, although the findings in relation to this principle were limited, there are many ways in which this area could be devloped in the future.

(vii) Educators can develop students' critical thinking skills using tablets , There was limited evidence of this in this study, but in order for the transformation of learning to take place in the the 21st century vision,there is the need to expand access to learning opportunities which enable students to learn how to become critical thinkers and problem-solvers. This entails access to the internet in a safe environment which enables students access online information. Limiting internet access by means of white listing, for instance, would definitely not create a learning environment where students can think critically and engage with a global community. Too many restrictions on internet access might also limit important digital story-telling tools which could also involve downloading real-time, based on inputs of users. Using tablets,

therefore, comes hand in hand with learning social responsibility and digital citizenship comptences. Ultimately, these experiences enhance the students' employability skills and prepare them for the future.

(viii) Educators need to promote collaboration around and through texts in negotiating meaning. As completely portable learning tools, tablets extend the learning spaces far beyond the classroom. This study showed that tablets enable the students' learning experience to become more personal, collaborative and globally connected. Due to the ubiquity of tablets and other mobile devices, global citizenship has become more prominent. Online communities create the right space for students or educators to work together, but tablets and other hand-held devices move the shift from co-operation to full collaboration. The reason for this is that they facilitate contributions from different individuals, as was demonstrated in the previous chapter.

The key findings of this thesis are that in the school that was the focus for this study, there were a number of benefits of using tablets in the classroom, and some challenges faced. The advantages were that: the portability of tablets enabled teaching to become flexible in terms of use of space and groupings; the use of touch-screens was found to be accessible for children and enabled collaboration; the tablets stimulated children's motivation for literacy learning and fostered their creativity; cross-curricular, multimodal and transmedia learning opportunities were presented; tablets supported language learning and facilitated personalised and autonomous learning, and they enabled teachers to create educational resources using apps to support language learning. The challenges presented by the use of tablets were: the integration as a technology that was new to the teachers was uneven due to their experience and confidence; choosing appropriate apps to support teaching and learning was a challenge,

especially given the limited number of apps using the Maltese language, and the tablets were expensive to purchase and to maintain. A further key finding was that the data indicate that tablets offer great potential to enable teachers in Malta to develop practice in line with the Charter for 21st Century Literacies. In the school that was the focus for the study, there was evidence of practice that is in Iine with such principles, such as the promotion of multiliteracies, engagement with a range of modes and media, and collaboration. However, it is clear that there are challenges in terms of enbedding the Charter, and that other principles such as the use of playful pedagogies, innovation and experimentation, and critical thinking were under-developed. This, I would argue, was due to a range of factors, as outlined above in relation to the challenges enountered, but a key reason was the requirement to adhere to a formal syllabus that restricted opportunities for these approaches.

5.3 Limitations of this study

The contribution of my study is important in showing the pedagogical affordances of using tablets in a classroom, and outlining the challenges faced by teachers in developing practice in line with the Charter for 21st Century Literacies. However, the scope of the study was limited in that I observed two small classrooms only. However, this entailed a longitudinal study over a period of two years and thus the study had depth. I was not intending to use the study to generalise, but to examine closely the nature of learning and teaching with tablets in Maltese classrooms.

A further limitation was that tablets were not taken home with the students. In this dissertation I explored extensive literature about the use of tablets at home, and studies which also attempt to link home and school technology use (such as O'Mara and Laidlaw, 2011). However,

tablets in this study were school property and they remained securely stored in school after the lesson. It was, therefore, not possible to study home use of the tablets. Nevertheless, it is important to develop understandings of classroom use of tablets in Malta, which this study undertook to do.

5.4 Implications of the study

The study has a number of implications for research, policy and practice, as follows.

5.4.1 Implications for further research

The study indicates that there needs to be further focus on continuing professional development if teachers are to develop their practices in line with the Charter for 21st Century Literacies. Further research could be undertaken in which teachers work together to address the Charter's principles, in order to identify the most effective means of developing pedagogy and practice, in line with Burnett and Merchant's (2018) recommendations.

In the previous chapter, I referred to the benefits of the use of tablets in the case of a student with hearing impairment. Tablets provided the child, Jennifer, with a one-to-one learning approach and dynamic visuals, which helped her in her learning. However, further studies are required about how tablets can be beneficial for children with special education needs. Focused studies could also analyse how some tablet features, such as screen descriptive tools, may help students like Jennifer.

5.4.2 Implications for practice

Teachers should keep in mind that, despite the pedagogical affordances of tablets, they should be used in a meaningful way. Tablets alone would not solve literacy and other educational problems. The teachers who participated in my research combined digital with non-digital learning and both ways were used to improve student engagement and their literacy skills. From this study, therefore, I can deduce that the combined use of tablets with other learning tools provided significant opportunities in terms of tangibility, multi-modality, anytime-anywhere learning as well as autonomous learning. The implication here is that teachers can effectively integrate tablets into the literacy curriculum if they undertake this in a reflective manner. Improved understanding of how to make effective use of tablets should include training which allows teachers to focus on the implications of their use in relation to more traditional media and approaches, so that the approaches and methods can be integrated successfully.

Although motivation emerged as one of the themes in this thesis, both from the literature and my empirical research, tablets are not merely about making the lessons more fun. The challenge for educators is to make sure that they are inducing a positive atmosphere into areas that are part of the curriculum. This study, therefore, recommends curriculum mapping training, which would enables teacher to consolidate their lessons in terms of a student-centred approach and delivery.

Finally, as argued throughout the thesis, teachers should also be focused on equipping students with the digital competences required for the 21st century. As Santori et al., (2018, p.30) accurately put it:

> Researchers and teachers must be prepared to help all students develop digital literacies, and to leverage engagement with technology in ways that are shown to enhance students' content knowledge while also gaining technological skills essential for participation in our global society. (p.30)

The Charter for 21st Century Literacies (Burnett and Merchant, 2018) offers a robust set of principles to work to, but it was found in this study that they were not all present in the teachers' use of tablets in the classroom. It is recommended that professional development courses are prepared that offer teachers clear guidance on how these principles can inform their teaching in the future.

5.4.3 For policy makers

The Maltese Ministry of Education is in the process of changing the curriculum and also implementing tablets in the secondary school, The new learning outcomes envisaged by the national curriculum framework (MEDE, 2012) were a step forward from a prescriptive curriculum and rigid teaching environment. Before launching a new curriculum and widening the introduction of tablets in the classroom, policy-makers should ask themselves how far the implementation of the tablet programme in primary schools has led to genuine changes in innovation and pedagogy in the classroom. This may then impact on the type of curriculum changes and training approaches that are required in order to effect real change.

Twenty-first century education has to strike the right balance between avoiding introducing necessary changes, which might create instability, and at the same time being safely prepared for new competences that society requires. Creativity and the ability to create content as key 21st century digital competences entail that teachers foster the opportunities envisaged by Burnett and Merchant (2018). This thesis indicates the need for curricula which support open

learning and inquiry-based learning, while encouraging creativity. Newly purchased digital software should consist of mobile/tablet-friendly authoring tools which allow teachers to create their own digital content. The technological infrastracture should also support these 21st century digital competences. While it is recommended that wireless networks be filtered for undesirable content, network administrators should ensure that the filtering process is kept as unobstrusive as possible. Tablets provide increased access to resources, information and knowledge, but this has to be supported both by the curriculum and also by the technological infrastructure.

This thesis affirms that the pupils who were part of my research study were alert to activities on tablets and these devices fostered their interest in the lessons, as well as impacted positively on their willingness and confidence to share their writings with their peers. Ongoing collaboration, in terms of project-based learning, should be our next aim and curricular policies have to create an environment in which children can feel a sense of belonging. Policy makers should provide for interdisciplinary learning where digital and other transversal competences can be mastered. My conclusions are that nurturing of these competences can be faciliated by tablet-mediated teaching and learning, but this has to be embedded in policy.

5.5 Contribution of my study

The presence of tablets in the classroom is breaking new ground worldwide, but at the time of my study, the presence of tablets in Maltese classrooms was sporadic and scarce. During the writing process of my thesis, Malta became one of the first countries to invest in tablets on a national level, ensuring all year 4 to year 6 students had access. Currently, there are also plans for a similar initiative in secondary schools.

The unique characteristics of Malta as a Mediterranean island with a fast-growing economy entail the need for a situated research which reflects the local context, rather than relying on research studies conducted in other countries. A belief held by qualitative researchers is that "reality is historically and socially constructed" (Gerber, Williams, & Biilmann, 1995, p.284) and "shaped by social place" (Prinsloo & Rowsell, 2012). To date, this is the only independent research about tablet usability for literacy in primary classrooms in Malta that investigates how far the Charter for 21st Century Literacies is embedded in practice. My research is directly relevant to Malta's strategic priorities, which include the one-tablet per child as part of the plan to boost literacy skills. It is important to undertake research independent of government initiatives in order to investigate the topic more fully.

As explained in Chapter 3, the timeframe for my empirical research was ideal because it was just one year before the Ministry of Education started the rollout of tablets as part of the One-Tablet-Per-Child initiative. The Ministry of Education's investment is certainly linked to equipping students with 21st century digital competences and also improving other literacy skills, as explained in Chapter 1. Educational attainment is a key determinant to employability and in this regard, Malta is committed to invest in human capital development through education and training, which are the major drivers in achieving social and economic objectives. My study has made a contribution to understanding how best to ensure that tablets are used in primary schools in Malta in ways that can ensure this commitment to human capital development is undertaken in ways that foster creativity and innovation.

5.6 Conclusion

This thesis has addressed the affordances of tablets for the development of digital literacies. It has outlined both the challenges and opportunities provided by tablets, grounded in close observations of two classrooms. The study makes an original contribution to the literature in that it has indicated how tablets can be of value in Maltese primary classrooms. It has provided insights into how far the principles outlined in the 'Charter for 21st Literacy' are embedded in practice, and what needs to happen in order for these principles to truly inform teaching and learning in our country. This is a challenge for the future, which I look forward to continuing in my work.

The Charter for the 21st century Learning (Burnett and Merchant, 2015) is adopted in this theses to serve as a guide for tablet-mediated teaching and learning by transforming literacy teaching from paper-based texts to variety of modes; from a set of specific skills to a diversification of communicative practices; from encouraging the production of polished texts to experimantation. There are challenges to be overcome in the implementation of a tablet learning programme guided by the ninr principles of the Charter. Curricula have to be less restricitve in order to allow students to experiment. More coordination between Education Officers who have the role of curriculum managers should promote interdisciplinary learning rather than subject-based learning. This should allow more inquiry-based learning and the use of open-ended apps.. Open-ened apps would have allowed more cross-curicularity. In secondary schools students have more limited time for exploration, since lessons are restricted to a 40 minute period and the silo-mentality barrier is an even more common occurence. Project-based learning would bring together information and ideas from different subjects and

transversal areas, enabling more the realisation of the Charter for 21st century literacies in our classrooms.

These changes are needed, I would argue, if Maltese schools are to transform teaching from teacher-led to student-centred processes and activities. This thesis serves to contribute to this task, and I look forward to the challenges ahead as these ideas are taken forward into policy and practice.

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Appendices

Appendix I: Ethical Clearance

Application 006824

Section A: Applicant details

Date application started:
Thu 5 November 2015 at 18:35

First name:
Omar

Last name:
Seguna

Email:
oseguna1@sheffield.ac.uk

Programme name:
Literacy and Language in Education (EdD/Literacy & Lang in Educ DL) - EDUR32

Module name:
Temp
Last updated:
16/02/2016

Department:
School of Education

Applying as:
Postgraduate research

Research project title:
Including tablet usability in digital literacies to improve literacy skills

Has your research project undergone academic review, in accordance with the appropriate process?
No

Similar applications:
- not entered -

Section B: Basic information

Supervisor

Name	Email
Kate Pahl	k.pahl@sheffield.ac.uk

Proposed project duration

Start date (of data collection):
Mon 1 February 2016

Anticipated end date (of project)
Thu 30 June 2016

3: Project code (where applicable)

Project code
- not entered -

Suitability

Takes place outside UK?
Yes

Involves NHS?
No

Health and/or social care human-interventional study?
No

ESRC funded?
No

Likely to lead to publication in a peer-reviewed journal?
No

Led by another UK institution?
No

Involves human tissue?
No

Clinical trial or a medical device study?
No

Involves social care services provided by a local authority?
No

Involves adults who lack the capacity to consent?
No

Involves research on groups that are on the Home Office list of 'Proscribed terrorist groups or organisations?
- not entered -

Indicators of risk

Involves potentially vulnerable participants?
Yes

Involves potentially highly sensitive topics?
No

Section C: Summary of research

1. Aims & Objectives

Tablets nowadays have become almost commonplace in people's homes and are accessible to children even at an early age. An ingrained belief held by educators is that in a technology-driven world, our traditional teaching and pedagogical approaches do not cut the mustard anymore with students who can be considered as digital natives. On the other hand I believe that, tablets are not a quick-fix solution for outstanding educational problems. This research is significant because it will analyse whether or not the use of tablets will reach its pedagogical aims, and how these devices can actually contribute further to literacy skills, keeping in mind that this is the Ministry of Education in Malta's top strategic priority.

In this empirical research,
(a) I am going to observe whether tablets create new affordances for literacy learning. Rather than on the development and progression of young children's literacy enhancement through e-reading with and without tablets, I am more interested in finding out affordances of tablets in a learning context. How far possible is it to deliver learning activities with tablets which may potentially involve inquiry-based learning, collaboration, augmented reality, multimodal interaction, etc ?
(b) I would also like to discover the role that new literacies have on young people's literacies both at home and at school. I am also particularly interested how children do perceive digital text, visual arrangements of text, images and symbols rather than linear text.
(c) Another concern for teachers, which would also be interesting to observe is, whether tablet usage causes distraction to the detriment of the learning process.

(d) I would also like to explore peer learning. Children and young people communicate and spend a lot of time with each other. During this interaction there is, a lot of learning taking place
(e) Another area of interest will also be the type of applications and websites used.

2. Methodology

a) I will conduct participant observation of a classroom in a state school. I will observe a 5-6 years old classroom and take notes during the lessons.

b) I am going to stay in class during the lesson. However I am going to do my best not to be obtrusive so that I will not bias the observations.

c) As it is the case when technologies are used, the e-learning support teacher assigned at the school may help the classroom teacher. Learning Support Assistants may also be present in class.

d) I will film parts of the lesson. Adults and children may also choose to be observed but not filmed, or to opt out from the research at any time.

e) In this research children are seen as active participants. Children may also use tablets to film some of their activities. Data protection will be observed at all time. Besides the usual data protection forms which are kept by the school, students will sign whether or not they would like to be filmed for my research in a separate consent form I will hand out to them.

f) The class will be observed once a week for 6 months (about 20 lessons).

g) Since the children will not be required to do some "special" tasks I am not going to ask them to sign before each and every lesson. However they are going to be informed, and their parents are going to be informed too that they have a right to "withdraw" or "optout" of the study or procedure at any time.

h) I am also interested in "out-of-school" activities which must also be given their due credit since, schools sometimes tend to formalise learning. When children use tablets at home, during their free time, lots of self-learning takes place. In order to learn how students are using tablets at home, I will try to keep in touch with some parents about how their children use tablets at home. I am aware that the accuracy of this data may not be hundred percent correct, but it would suffice to have a picture of the usage of tablets at home.

3. Personal Safety

Have you completed your departmental risk assessment procedures, if appropriate?

- not entered -

Raises personal safety issues?

No

- not entered -

Section D: About the participants

1. Potential Participants

This empirical study will be conducted in a perfect time frame; between a pilot project commissioned by the Ministry of Education as part of the "one tablet per child" initiative and the roll-out of tablets in January 2016. This is quite an excellent opportunity since, my research will not conflict in anyway with other projects related to tablets. On the other hand, all tablets which were used during the pilot project have been collected by the suppliers and anecdotal evidence suggests that, only one school has tablets which were provided through an independent initiative. This school has a media room where iPads are often used and is also equipped with apple TV.

Children (5-6 years old) will be given the opportunity to use these tablets. The methods are going to focus on doing research with the children rather than on the children. Rather than delving into a feasibility analysis of whether the tablets project may be implemented or not, I am more interested in the way tablets can be used in digital literacies to boost literacy skills and their role in the digital citizenship curriculum. Furthermore, this study can provide a framework to link literacies, technologies, and guidelines as to how children can be smart online.

2. Recruiting Potential Participants

The collaborating school and classrooms have already been identified and likely participants have indicated an interest to be involved. The school which has the necessary infrastructure including Wi-Fi, tablets and other equipment will benefit both from the findings and also from the project itself.

2.1. Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by CiCS? No

- not entered -

3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) Yes

Children already have submitted the data protection forms in the beginning of the scholastic year. However, participant information sheets and consent forms will be delivered prior to the commencement of the research, both to the teacher/s and also to children. Since this study involves children, the consent forms will not be a one-time transaction. Children are going to be informed that they may opt out at any time. The information and consent forms are mainly non-textual and make heavily use of drawings. Parents/Guardians' approval is going to be sought and they ma choose for their children to opt out at any time.

4. Payment

Will financial/in kind payments be offered to participants? No

5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

Although there are no issues of personal safety, common sense will be exercised at all times. Charging of tablets will always be done under adult supervision. Under no reason will children be allowed to disassemble, hack or tamper with hardware, software and other accessories. Users should not download music, videos or other files from any file sharing sites unless directed by or with the permission of the teacher. Children's privacy will be respected at all times.

How will this be managed to ensure appropriate protection and well-being of the participants?

1) Since the research will be conducted in state schools, I would definitely require ethical approval by the Research and Development Department within the Ministry of Education. Following this approval, I will be able to observe the students and the teacher.
2) I will not have any undisclosed conflict of interest. Part of the precautionary steps I 've taken is that I chose not to be part of the decision-taking of the implementation
3) Actual names of schools and students will not be mentioned in the writing of the dissertation, particularly on a small island like Malta where schools may be more easily identified. While doing the research it is important that, the participants be observed on how tablets are helping them. I will not use this data for other purposes such as commenting about the behaviour of these students. Further to this I will keep this data confidential, and such data may not be used for other purposes, for example to inform the school administration about students' behaviour issues etc.
4) Since my study involves young children, the information and consent forms are mainly non-textual and will be explained for them that they may choose not to participate. I will also require their parents/guardians' consent.
5) All participants may also choose to be researched but not to be filmed.

Section E: About the data

1. Data Confidentiality Measures

Data will not be used for other purposes other than for this research. Videos and notes taken will not be published or shared, neither within nor outside the school. Participants will be assured that results are going to be anonymous.

2. Data Storage

a) Data observations will be logged by myself on a diary which will only be accessed by me and securely locked away. Video will be recorded on a SD card which will also be securely stored. All data transferred on the PC will not be shared for any reason, on the cloud. Laptop is password-protected. No one will have access to hard data. This data will not be shared with teachers or parents.

b) Films recorded by students will be, saved on iPads and securely storedat school. Immediately after every session, data will be securely saved on my personal dropbox.com accounts and removed from every iPad. This will prevent unauthorised access to data. This data will eventually be transferred onto a CD by myself.

c) All recordings and notes will be stored on my personal hard drive.

Section F: Supporting documentation

Information & Consent

Participant information sheets relevant to project?
Yes

Document 1014715 (Version 1)	All versions
Document 1014714 (Version 1)	All versions
Document 1014712 (Version 1)	All versions

Consent forms relevant to project?
Yes

Document 1014716 (Version 1)	All versions
Document 1014713 (Version 1)	All versions

Additional Documentation

External Documentation

- not entered -

Section G: Declaration

Signed by:
Omar Seguna
Date signed:
Tue 12 January 2016 at 08:34

Offical notes

- not entered -

Downloaded: 27/01/2020
Approved: 16/02/2016

Omar Seguna
Registration number: 130136804
School of Education
Programme: Literacy and Language in Education (EdD/Literacy & Lang in Educ DL) - EDUR32

Dear Omar

PROJECT TITLE: Including tablet usability in digital literacies to improve literacy skills
APPLICATION: Reference Number 006824

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 16/02/2016 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 006824 (form submission date: 12/01/2016); (expected project end date: 30/06/2016).
- Participant information sheet 1014715 version 1 (12/01/2016).
- Participant information sheet 1014714 version 1 (12/01/2016).
- Participant information sheet 1014712 version 1 (12/01/2016).
- Participant consent form 1014716 version 1 (12/01/2016).
- Participant consent form 1014713 version 1 (12/01/2016).

If during the course of the project you need to deviate significantly from the above-approved documentation please inform me since written approval will be required.

Your responsibilities in delivering this research project are set out at the end of this letter.

Yours sincerely

David Hyatt
Ethics Administrator
School of Education

Please note the following responsibilities of the researcher in delivering the research project:

- The project must abide by the University's Research Ethics Policy: https://www.sheffield.ac.uk/rs/ethicsandintegrity/ethicspolicy/approval-procedure
- The project must abide by the University's Good Research & Innovation Practices Policy: https://www.sheffield.ac.uk/polopoly_fs/1.671066!/file/GRIPPolicy.pdf
- The researcher must inform their supervisor (in the case of a student) or Ethics Administrator (in the case of a member of staff) of any significant changes to the project or the approved documentation.
- The researcher must comply with the requirements of the law and relevant guidelines relating to security and confidentiality of personal data.
- The researcher is responsible for effectively managing the data collected both during and after the end of the project in line with best practice, and any relevant legislative, regulatory or contractual requirements.

Appendix II: Information and Consent form for Teachers

Including tablet usability in digital literacies to improve literacy skills

I am Omar Seguna and I am currently reading for a Doctor of Education with the University of Sheffield. My area of research is how tablets can be used in the classroom. Before you and your students decide whether you would like to take part or not, it is important for you to know why the research is being done and what it will involve. Please take time to read this information sheet carefully. If there is anything that is not clear, or if you would like more information, please do not hesitate to contact me on my mobile phone 99870486 or by email: seguna2005@gmail.com

What is the purpose of this study?

The aim of the study is to explore how tablets can contribute to literacy skills. This study is NOT related to anyway to the "One Tablet per Child" initative and the distribution of tablets which will start during the next scholastic year. However my analysis will definitely help teachers make the best use of tablets in the classroom.
I believe that tablets are not a quick-and-easy fix to educational problems. On the other hand, I would like to explore the advantages of this new technology when it is used appropriately such as the facilities it offers to allow students to create stories, share ideas and browse for information.

What are digital literacies?

Digital literacies are the skills which enable us to live, learn and work in a society where so many digital devices are used such as laptops, tablets and smartphones.

Why have we been invited?

Your school is equipped with iPads and wi-fi. I would like to observe how tablets can be used and whether they can boost literacy skills.

What will happen if we decide to take part?

I am going to observe English/Maltese lessons where iPads are used. Observations will not interfere with the learning process of the child. I will observe the classroom and the child. The lesson is going to be filmed. Filming will be used for research purposes only and will not be published. Notes of the lesson and films will NOT be accessible to anyone, except me. Any data will be published ANONYMOUSLY.

What does this involve?

Children will be asked to follow the lesson as usual. The class will be observed once a week for 6 months (about 20 lessons).

What are the potential benefits?

Since tablets are relatively new educational tools, their use in the classroom will be a wonderful learning experience in itself. Besides, I also hope that this study will be beneficial to other educators in the future, particularly after the roll-out of tablets in schools.

Do I have to take part in this research?

Participation in this research is purely voluntary. You can also change your mind at any time.

Who will have access to the research records?

Data observations will be logged by me on a diary which will only be visible to me and securely locked away. Data will not be used for other purposes other than for this research. Videos and notes taken, will not be published or shared neither within the school nor outside the school.

What do I have to do should I have further difficulties?

Please feel free to contact me at any time. My mobile number is 99870486. If you prefer email, my address is seguna2005@gmail.com.
I am happy to answer any questions you might have.

Thank you for taking the time to read this information sheet.
Your help makes my research possible!

Including tablet usability in digital literacies to improve literacy skills

Please read the following statements and, if you agree, place a tick in the corresponding box to confirm agreement:

	Initials
I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	
I understand that my data will be treated confidentially and any publication resulting from this work will report only data that does **not** identify me.	
I freely agree to participate in this study.	
I understand that the lessons are going to be filmed.	

Signatures:

Name of participant (block capitals)	Date	Signature
Researcher (block capitals)	Date	Signature

Appendix III: Information and Consent form for Parents

Including tablet usability in digital literacies to improve literacy skills

I am Omar Seguna and I am currently reading for a Doctor of Education with the University of Sheffield. My area of research is how tablets can be used in the classroom. I would like to invite your child to take part in my research study. Before you and your child decide whether you would like to take part or not, it is important for you to know why the research is being done and what it will involve. Please take time to read this information sheet carefully. If there is anything that is not clear, or if you would like more information, please do not hesitate to contact me on my mobile phone 99870486 or by email: seguna2005@gmail.com

What is the purpose of this study?

The aim of the study is to explore how tablets can contribute to literacy skills. This study is NOT related to anyway to the "One Tablet per Child" initative and the distribution of tablets which will start during the next scholastic year. However my analysis will definitely help teachers make the best use of tablets in the classroom.
I believe that tablets are not a quick-and-easy fix to educational problems. On the other hand, I would like to explore the advantages of this new technology when it is used appropriately such as the facilities it offers to allow students to create stories, share ideas and browse for information.

What are digital literacies?

Digital literacies are the skills which enable us to live, learn and work in a society where so many digital devices are used such as laptops, tablets and smartphones.

Why have we been invited?

Your child's school is equipped with iPads and wi-fi. I would like to observe how tablets can be used and whether they can boost literacy skills.

What will happen if my child will take part?

Your child will attend English / Maltese lessons as he/she does everyday. Lessons will be delivered by classroom teacher as usual. Observations will not interfere with the learning process of the child. I will observe the classroom and the child. The lesson is going to be filmed. Filming will be used for research purposes only and will not be published. Notes of the lesson and films will NOT be accessible to anyone, except me. Any data will be published ANONYMOUSLY.

What will your child be asked to do?

Your child will be asked to follow the lesson as usual. The class will be observed once a week for 6 months (about 20 lessons).
Further to this, if you wish to help me learn more how the tablet is used at home, I would appreciate if you discuss with me how your child is using the tablet at home, e.g. what apps he/she is using.

What are the potential benefits?

Your child will benefit from making the best use of tablets as educational tools. Besides, I also hope that this study will be beneficial to other children and educators in the future, particularly after the roll-out of tablets in schools.

Does my child have to take part in this research?

Participation in this research is purely voluntary. You can also change your mind at any time.

Who will have access to the research records?

Data observations will be logged by me on a diary which will only be visible to me and securely locked away. Data will not be used for other purposes other than for this research. Videos and notes taken, will not be published or shared neither within the school nor outside the school.

What do I have to do should I have further difficulties?

Please feel free to contact me at any time. My mobile number is 99870486. If you prefer email, my address is seguna2005@gmail.com.
I am happy to answer any questions you might have. I would be extremely grateful if you could return the enclosed form to your child's teacher.

Thank you for taking the time to read this information sheet.
Your help makes my research possible!

Including tablet usability in digital literacies to improve literacy skills

Please read the following statements and, if you agree, place a tick in the corresponding box to confirm agreement:

	Initials
I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	
I understand that my data will be treated confidentially and any publication resulting from this work will report only data that does **not** identify me.	
I freely agree to participate in this study.	
I consent my child to be filmed during the lesson.	

I want to discuss with the researcher how my child is using the tablet at home.	

Signatures:

Name of participant (block capitals)	Date	Signature
Researcher (block capitals)	Date	Signature

Appendix IV: Information and Consent form for Parents (Maltese version)

Including tablet usability in digital literacies to improve literacy skills

Jien Omar Seguna u bħalissa qed nagħmel Dottorat fl-Edukazzjoni mal-Universita' ta' Sheffield. Ir-riċerka tiegħi hija dwar kif it-tablets jistgħu jintużaw fil-klassi. Qed nistieden lit-tifel/tifla jieħu/tieħu sehem f'din ir-riċerka. Qabel inti u t-tifel/tifla tiddeċiedu jekk tiħdux sehem, importanti li tkunu tafu għalfejn qed issir din ir-riċerka u x'ser tinvolvi. Jekk jogħġbok aqra din l-informazzjoni sew. Jekk hemm xi informazzjoni li mhux ċara, jew tixtieq aktar informazzjoni, tiddejjaqx tikkuntatjani fuq in-numru tal-mobajl tiegħi 99870486 jew permezz tal-indirizz elettroniku: seguna2005@gmail.com

X'inhu l-għan ta' dan l-istudju?

L-għan ta' dan l-istudju huwa li niskopri kif it-tablets jistgħu ikunu ta' kontribut fil-ħiliet tal-litteriżmu. Dan l-istudju bl-ebda mod MHU relatat mal-inizjattiva "Tablet għal kull wild" u t-tqassim tat-tablets li mistenni jibda matul is-sena skolastika li jmiss. Madankollu l-analiżi tiegħi ser tgħin mhux ftit lill-għalliema jagħmlu użu tajjeb tat-tablets fil-klassi.
Nemmen li t-tablets mhumiex soluzzjoni awtomatika għall-problemi edukattivi. Min-naħa l-oħra, nixtieq niskopri l-vantaġġi ta' din it-teknoloġija ġdida meta tkun użata sew bħalma huma l-faċilitajiet illi toffri sabiex l-istudeni jkunu jistgħu joħolqu stejjer, jaqsmu ideat u jfittxu għall-informazzjoni.

X'nifhmu meta ngħidu Litteriżmu Diġitali?

Il-litteriżmu diġitali jikkonsisti f'dawk il-ħiliet li permezz tagħhom nistgħu ngħixu, nitgħallmu u naħdmu f'soċjeta' fejn jintużaw bosta apparat diġitali bħalma huma laptops, tablets u smartphones.

Għaliex ġejna magħżulin?

L-iskola tat-tifel/tifla hija mgħammra bl-iPads u l-wi-fi. Nixtieq nosserva kif it-tablets jistgħu jintużaw u jekk jistgħux itejbu il-ħiliet tal-litteriżmu.

X'jiġri jekk it-tifel/tifla tiegħi jieħu/tieħu sehem?

It-tifel/tifla tiegħi tagħmel il-lezzjonijiet tal-Ingliż u l-Malti bħalma tagħmel kuljum. Il-lezzjonijiet isiru bħas-soltu mill-għalliema tal-klassi. L-osservazzjonjiet m'humiex se jtellfu t-tagħlim tat-tifel/tifla. Jien se nosserva l-klassi u t-tifel/tifla. Il-lezzjoni ser tkun iffilmjata. Il-filmati ser jintużaw biss għal skop ta' riċerka u MHUX se jiġu pubblikati. Kemm in-noti dwar il-lezzjonijiet kif ukoll il-filmati MHUMIEX se jkunu aċċessibbli għal ħadd, u narhom jiena biss. Id-data tiġi pubblikata b'mod ANONIMU.

X'ser jiġi mitlub mit-tifel/tifla tiegħek?

It-tifel/tifla ser isegwi/issegwi l-lezzjonij bħas-soltu. Il-klassi ser tiġi osservata darba fil-ġimgħa għal sitt xhur (madwar 20 lezzjoni)
Barra minn hekk, jekk tixtieq tgħinni nsir naf aktar dwar l-użu tat-tablets fid-dar, napprezza ħafna jekk tiddiskuti miegħi kif it-tifel/tifla qed juża/tuża t-tablet id-dar, ngħidu aħna x'tip ta' apps qed juża/tuża.

X'inhuma il-benefiċji li nieħu sehem?

It-tifel/tifla tiegħek tkun qed tagħmel l-aħjar użu tat-tablet bħala għodda edukattiva. Barra minn hekk, nittama li dan l-istudju fil-ġejjieni jkun ta' benefiċċju wkoll kemm għal edukaturi kif ukoll tfal oħra, speċjalment wara li jiġu mqassma t-tablets fl-iskejjel.

It-tifel tiegħi ser ikollu jieħu sehem f'dan l-istħarriġ?

Il-parteċipazzjoni f'dan l-istħarriġ hija purament volontarja. Tista' terġa' tibdel ħsiebek aktar `il quddiem.

Min se jkollu aċċess għar-rekords tar-riċerka?

In-noti dwar l-osservazzjonijiet ser jittieħdu minni fuq djarju li narah jiena biss u ser jinżamm imsakkar. Id-data mhux ser tintuża għall-ebda raġuni oħra ħlief għal din ir-riċerka. Il-filmati u n-noti mhux se jiġu pubblikati jew mifruxa la ġo l-iskola u lanqas barra mill-iskola.

X'irrid nagħmel f'kaz li jkolli aktar diffikultajiet?

F'każ ta' diffikulta' tiddejjaqx tikkuntatjani. In-numru tal-mobajl tiegħi huwa 99870486. Jekk tippreferi permezz tal-imejl, l-indirizz elettroniku huwa seguna2005@gmail.com.

Lest li nirrispondi kwalunkwe mistoqsija li jista' jkollok. Inkun obbligat jekk tista' tibgħat il-formola mehmuża mal-għalliema tat-tifel/tifla.

Ħajr talli sibt il-ħin taqra din l-informazzjoni.
Jista' jirnexxieli nagħmel din ir-riċerka permezz tal-għajnuna tiegħek!

Including tablet usability in digital literacies to improve literacy skills

Jekk jogħġbok aqra dawn li ġejjin u jekk taqbel, agħmel sinjal fil-kaxxa sabiex tikkonferma li taqbel ma' dan il-ftehim:

	Inizjali
Nikkonferma li qrajt u fhimt l-informazzjoni dwar dan l-istudju. Kelli l-opportunita' nagħrbel l-informazzjoni, nistaqsi mistoqsijiet u sodisfatta bit-tweġibiet.	
Nifhem li l-parteċipazzjoni tiegħi hija volontarja u nista' noħroġ minnha fi kwalunkwe ħin mingħajr ma nagħti raġuni.	
Nifhem li d-data miġbura se tiġi trattata b'mod kunfidenzjali u f'kull pubblikazzjoni li tista' toħroġ minnha bl-ebda mod ma nkun identifikata.	
Jien naqbel li nipparteċipa f'dan l-istudju.	
Nagħti l-permezz biex it-tifel/tifla jiġi/tiġi ffilmjat/a matul dawn il-lezzjonijiet.	

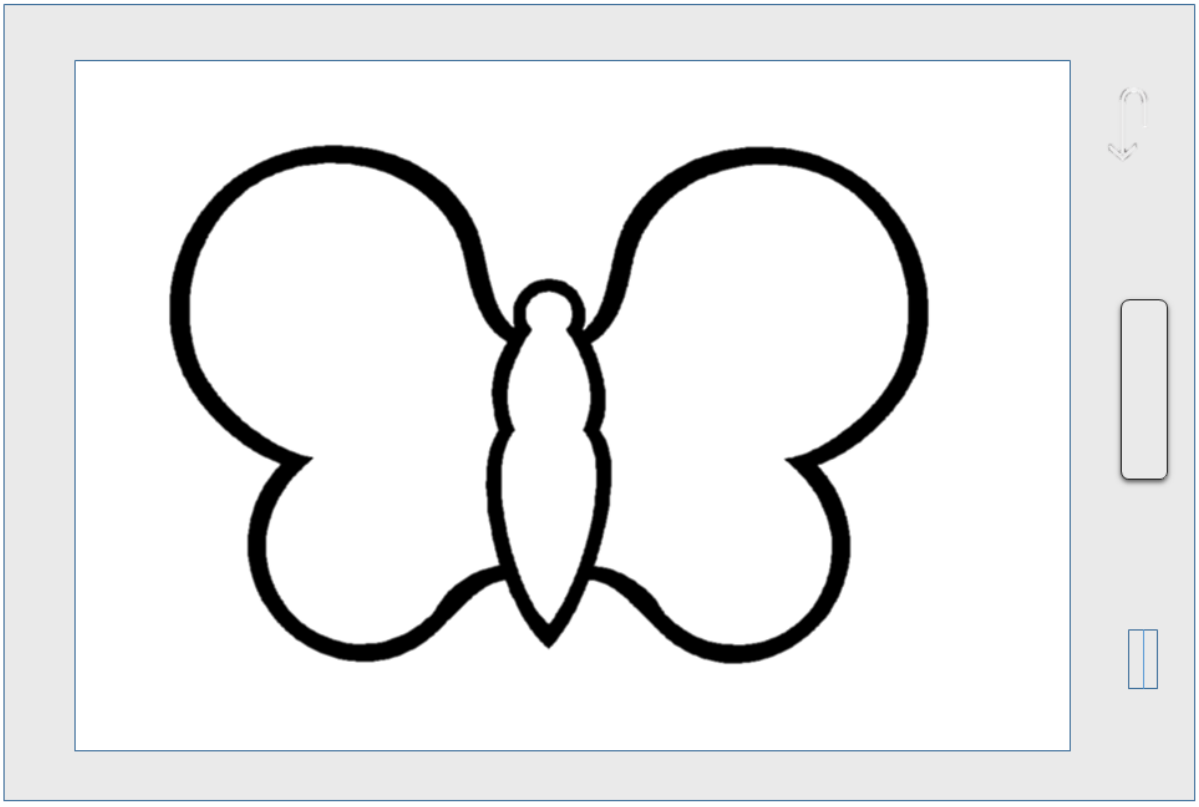
Nixtieq niddiskuti mar-riċerkatur dwar kif it-tifel/tifla qed tuża t-tablet id-dar.	

Firem:

Isem tal-Parteċipant	Data	Firma
Isem tar-Riċerkatur	Data	Firma

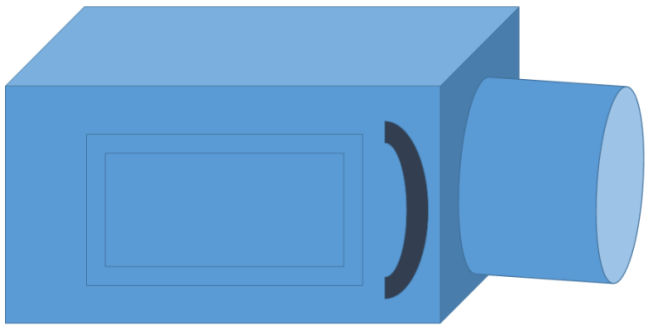
Appendix V: Information and Consent form for Children

Including tablet usability in digital literacies to improve literacy skills



I am going to have 20 lessons using tablets.
I am going to learn Maltese and English using tablets.
Mr. Omar will be present during these lessons.

The lessons will be fun.
I will use tablets.



I know the lesson is going to be filmed.

Only Mr. Omar will see the film.

If I have not understood, I may ask Mr. Omar.

All finished! Time to continue with the lesson now.

……

I think I want to take part in these lessons

☐ Yes	☐ No

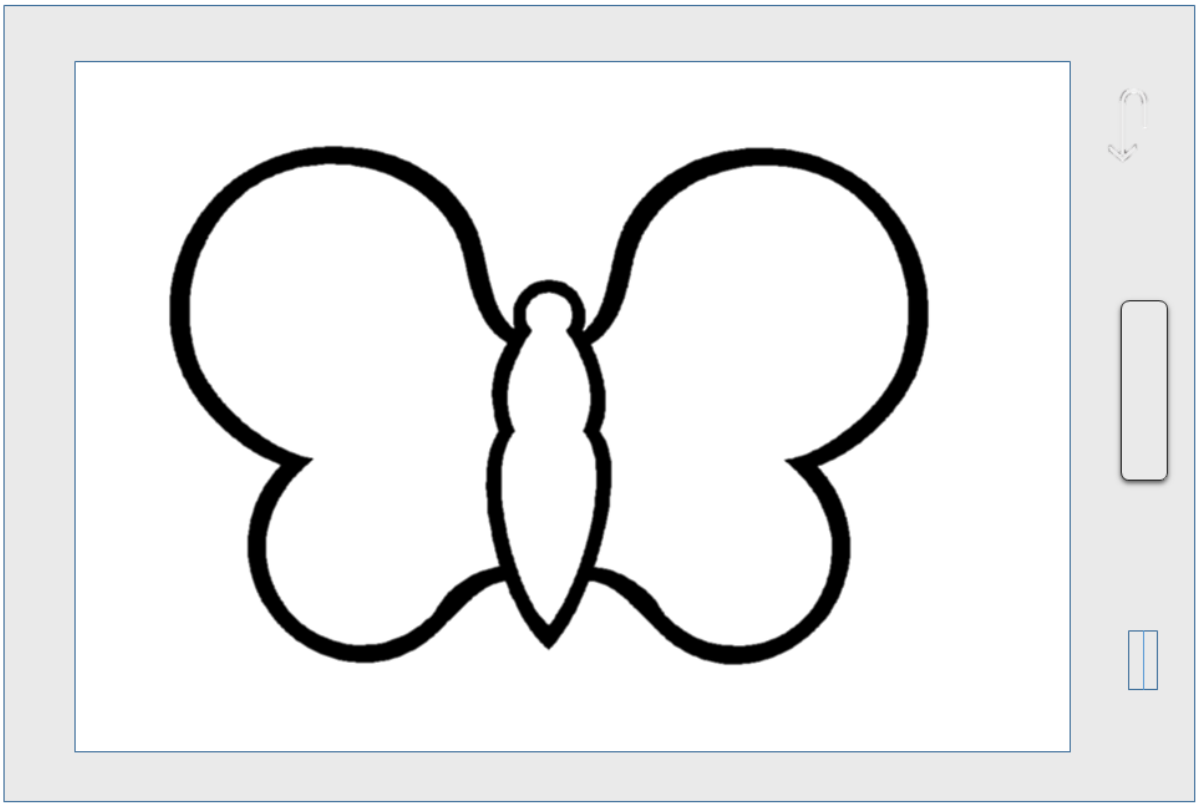
It is OK if I am filmed and only Mr. Omar will see the film

☐ Yes	☐ No

All images are adapted from Free colouring pages, http://www.coloring.ws/

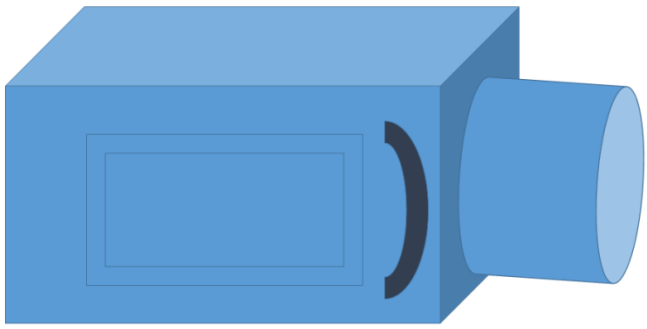
Appendix VI: Information and Consent form for Children (Maltese version)

Including tablet usability in digital literacies to improve literacy skills



Jien se nuża t-tablets matul dawn l-20 lezzjoni.
Jien se nitgħallem il-Malti u l-Ingliż permezz tat-tablets.
Is-Sur Omar se jkun preżenti matul dawn il-lezzjonijiet.

Se nieħdu gost waqt il-lezzjonijiet.
Se nuża t-tablets.



Jien naf li din il-lezzjoni ser tiġi ffilmjata.

Is-Sur Seguna biss ser jara l-film.

Jekk ma fhimtx xi ħaġa, nistaqsi lis-Sur Seguna.

Dak kollox! Issa nista' nkompli l-lezzjoni! .

……

Naħseb li rrid nipparteċipa fil-lezzjoni.

☐ **Iva**	☐ **Le**

Mhux problema li niġi ffilmjat/a u s-Sur Seguna biss ser jara dawn il-filmati.

☐ **Iva**	☐ **Le**

All images are adapted from Free colouring pages, http://www.coloring.ws/

Appendix VII: Code Map

Observation	**Description / Comment**	Vocalisation/ speech	Movement, Gesture, Facial expression	Intra-action	Ability to identify and articulate information needs	Expressing themselves creativily through digital media and technologies.	Collaborating with others in learning.	Theme
Ob1	Part 1: (a) Teacher using IWB, Kids singing (b) Picture match (c) IWB activity (d) Use of soft toy "Peter" (e) use of magnets (f) IWB activity find "ch" (g) singing with YouTube song(h) writing ch on their 'mini boards' . http://www.readwritethink.org/files/resources/interactives/picturematch/ was used			Children used magnetic boards				
ob1 3-3-2016 MsY n2 maincamera	Part 2: (a) paired work (b) Taking pictures of objects (c) activity cannot be done without use of tablets (d) showing pictures	Ms Yosanne: Show her number three. Philip: Miss t-three. Ms Yosanne: Show her number three on your fingers. Show her number three. (Ob1 3-3-2016 Ms Y n2 maincamera)		Children used tablets	enjoying filming the lesson		Working in pairs	Motivation / Inter-disciplinary learning

ob1 3-3-2016 MsY children1	Tthe children wrote the word next to the picture using their Ipads. This exercise was repeated for all digraphs (sh, th, ch).	Ms Yosanne: Very good, t-t-thermos. What do we have here? What do you have in your pictures?Pierre: Wow Ms Yosanne: Chocolate, can you give me a chocolate?Pierre: Mhm.Ms Yosanne: Yes, that one — Sit down properlyPierre: C-c-chocolateMs Yosanne: Take a picture.....Ms Yosanne: Very good. What do you have in your picture?Pierre: Take it.Philip: Shoes(ob1 3-3-2016 MsY children1 Transcript – Translated)			using camera to capture real life objects			Personalisation
Ob2	Activity consisting using the App (a) combination of letter name and sound name (b) personalised - children had to write their names (c) self-learning - progress. Teacher told me even if she is not observing all the time (d) individiaul learning- class setting very informal							

Time2Readapp		Ms Roberta: To read, time to read. We are going to start reading and there are three different islands, OK? Three different islands, an island is a land surrounded by the sea. John: Do I click? Ms Roberta: No, not now, wait. So, Malta is also an island because we are surrounded by the sea. (Ob2 3-3-2016 MsR maincamera – Translated)			Students accessed levels on their own. The levels of difficulty were well balanced, and the small steps ensured that the child progressed successfully through each level.. Feedback of activities provided			Personalisation / Inter-disciplinary learning
Ob2 3-3-2016 MsR maincamera				Direct touch techniques of interaction on screen				

Ob2 3-3-2016 MsR maincamera		Number one, now, number one, Kayden, number one. Wait a minute, now we need some sound. Let me show you how, so if we don't hear it, we press the sound again. Can you press it Kayden? Up here? You have to press the letter that sounds like 't'. [00:07:30] (Transalated)						
Ob2 3-3-2016 MsR maincamera		Researcher: …this is a lot of self-learning time, they learn a lot, kind of… [00:12:08] Ms Roberta: Yes, here I try as much as I can						Self-learning
Ob2 3-3-2016 MsR maincamera		Jacob: Look at John, Miss, John!Ms Roberta: Well done John.John: Miss I did this. [00:04:53]Ms Roberta: And done, which one? Done.Jacob: I want to click.Ms Roberta: Done.John: Miss? I did this (giggle).Jeffrey: Miss, look at what Jean Claude did! [00:05:12]Ms Roberta: Well done.					Students supporting each other	

Ob2 3-3-2016 MsR maincamera - Translated.docx		Interviewer: Miss, do they know the letter phonetically?Teacher: They should know them both.Interviewer: Both?Teacher: 'L'-'l'-'l'-'l', 'a'-'a'-'a'Interviewer: Because I noticed that he said the letter name not the letter soundTeacher: Because they are not all on the same...						Different learning abilities / self-learning
Ob2 3-3-2016 MsR chidren2 – Translated		Researcher: Listen, enter your name first because otherwise you will not be able to play. Do you know how to write your name? Do you know how?"						Difficulties of children
Ob3	Singing / Alphabest Song / Teacher reading words and students choose the right word	(a) Teacher told me that during parents' day many parents also noted that at home tablets were used to access videos and also to play (Digital literacy competences) (b) learn through play. They feel confident using tablets.						

Ob3 9-3-2016 MsYmaincamera 1				Using Phonics Pumkin App				Mult-modality
Ob4	(a) Alphabet song - phonics and sound version on tablet (b) ABC letters (non digital) (c) Preschool kindergarten activities							
Ob4 9-3-2016 MsRmaincamera 6				Joining the dots				Touch screen
Ob4 9-3-2016 MsRmaincamera 4	John got confused because of the sign-in to iTunes							Difficulties of children
Ob5	(a)Since it is a Maltese lesson students are introduced to Orsinu soft toy. Rehearsing alphabet in Maltese (b) Find letter. Students should know sequence of letter. Interesting ġ of ġiraffa and giraffes have dots (c) reading words with double letters in the middle e.g. sewwa, sodda. (d) Quizlet Enabled teacher to create her own activity using open-ended app. Advantage I noticed		Students were very engaged using tablets		Advantage I noticed were self testing, they could write the word, it was anothe educational resource and gained more interest.			Portability / Motivation

	were self testing, they could write the word, it was anothe educational resource and gained more interest. Multiple choice was very effective.				Multiple choice was very effective.			
Ob5 13-4-2016 MsY video9						willing to show me their work		Motivation
Ob5 13-4-2016 MsY video 2 – Translated		Pamela: Miss, my cover is white but I'm going to change it next year; I'm going to get a pink one. [00:03:54]						Personalisatin
Ob5 13-4-2016 MsY video 6		Interviewer: They have score points, that's an advantage.Ms Yosanne: And it shows you, you have to write it, for example this one... [00:00:34]						Self-Learning

Ob5 13-4-2016 MsY video3		Ms Yosanne: Tower (‘torri’), so click on the word and on the picture of the tower. The tower image is not showing, so click on the empty box, on scarf (‘xalla’) and scarf (‘xalla’), on tooth (‘sinna’) and tooth (‘sinna’) and so on until you do them all, is that clear? The more you practise the faster you can get and consequently you will be able to do them in less time. Cart (‘karru’), oh, oh, cart (‘karru’) and you keep going OK? You may start, let’s do them together. Not at random, you have to read the word first — read this [00:00:49]						Self-Learning

Ob6	a) Phonics song. Children using soft toy "Mr Koala" (b) Children asked letters on iwb (c) ay words reading. Whiteboard used passively to show pictures (d) Mr Koal put his glasses on - "I can see			No interacti vity with interacti ve whiteboa rd! Children did not tuch letters etc. As opposed to tablets				Difficultie s of Teachers. App is not related to objective of ee sound (choosing apps difficulty) (b) Teacher stated she requires help in using aurasma and other augmente d reality apps
Ob 6B	Healthy Eating				Using Żaqqinu jagħżel x'jiekol app to learn about Healthy Eating. Learning new Vocabula ty			Cross-Curricular ity / Suppoting Maltese Language

Ob7	Before lesson children changed the date of the HSBC calendar. This felt calendar creates a sense of touch (b) Rehearsing letters / drilling (c) video centopied (https://www.youtube.com/watch?v=sncdNk4yaA8); (c) Parts of sentence Introduction/body/conclusion ; part 2: a) Teacher created digital pictures; students participating ; sentence structure (il-libsa twila); Use of clapping. Students learning capital letters. What makes a sentence (starting with capital letter, ending with fullstop). Part 3. Static picture of article on whiteboard . At the same tie studnets trying to find a word. Part 4) Techer used iwb app. Using work book - writing at the end of the lesson Part 5: Tablets activity - Naqra Naqra. A) Literacy /							

	Oracy (b) Hear sound and associate with word e.g. P --- pala.							
				choosing the correct letter		Using app 'Naqra Naqra'		Supporting Maltese Language
Ob8	1) Alphabet song (2) Naughty sounds e.g. Truck (e) ow cow (f) multimodal lesson moon (3 sounds); Part B Using Iwb (Advantages of tablets??) Part c; Gerladine comes in (phonics) Video teaching igh e.g. High, light,. Children writing sound on miniwhiteboard. Part D. Use QR code to discover secre word							
Ob 8 WIN_20160429_11_12_20_Pro					reading a QR code using the camera facility software capability to attribute meaning to that code.			Multi-modality

Ob9	Sound IR whiteboard/collage/tablets. A. Use of mini whteboard (haptics is better? Motor skills) b. Children doing activities. Tablets lesson. Colleage by teacher. Children draw using Draw colour. Advantages of drawing with tablets, Children more comfortable, more colours less time consuming. Disadvntages ... Less tangibility, less sharing							
Ob9 11-5-2016 Ms Y video 6.MOV		Peter: Blue Ms Yosanne: Random... Philip: I want it with red Ms Yosanne: No everyone random						Sense of belonging
Ob9 11-5-2016 Ms Y video 8.MOV				Using colours from ipads to draw. Simulating drawing book		Drawing		Motivation

Ob9 11-5-2016 Ms Y video 6.MOV								Personalisation
Ob10								
Ob11	Student searching numbers. Teacher told me that they learn more using tablets because they are a new expereince. Part b. Numbers in words. Part C photos with ipads using Educrations. Part D. With Bocci				Inserting pictures on texts, Using camera to manage their own learning	used the camera facility to take a picture of the number and add it to 'EduCreations'		Multi-modality
from Ob 11 20-5-2016 Ms Y video 6				Patrick pinching his fingers together and moving them apart on the screen to enlarge the picture whilst using Edu creations app.				Touch screen

Ob11 20-5-2016 Ms Y video 6				Patrick dragging a picture				Touch screen
Ob11 20-5-2016 Ms Y video 9					Using tablets to learn numbers in Maltese	Photo of real life objects		Multi-modality
Observation 11b	Computational thinking		Enjoyed using bee-bots	Bee-bots were very appropriate for their hands	learning directional language and commands			
Ob12	Using apple TV. A) Children draw colour - displayed using apple TV others write the words. (b) Seection of words are blu, isfar, vjola, aħmar, roża, abjad, iswed, mara, tifel Part B Reading. (comment ipads could have been used easily like easy view)		Children seemed very satisfied	Writing on tablets				Portability
Ob12 25-5-2016 Ms Y video 7				Using fingers to colours				

Ob12 25-5-2016 Ms Y video 5					Using 'Drawing Desk: Draw & Paint Art' and find the right tools	pick up a colour and write down the word using that colour	Showing others using apple tv	Creativity / Transmedia
Ob13	IWB (a) use of iwb (b) using magic whiteboard and magnetic letters; Children touched mangets (compare with sands etc). Children writing on their own boards (magic boards); new word "here" Techers used virtual room as an incentive for good behaviour "Jekk ma tobdux ma mmorux" . If here comes near here if there go away . PART B On tablets app used Tricky words; Closed ended of the shelf; Testing learn new sords; sounds touching, very multimodal							
Ob 13 25-5-2016 Ms R 5		Ms Roberta: If you do not hear it properly press replay, green and two, green and two.						Self-learning

Ob 13 25-5-2016 Ms R 5 – Translated		Jacob: The red Miss? What do I have to press? Miss? But what do I need to press? [00:02:57]						Difficulties of children
Ob 13 25-5-2016 Ms R 5 – Translated		Now, shh, listen, listen, listen, if you keep talking, we will not be able to listen. Did I say you can start on your tablet? I said, "look here", so that you'll know how to use it and then you can use yours on your own.						Disruptions becaue of tablet's portable nature
Ob 13 25-5-2016 Ms R 5 – Translated		You are not on the same activity I told you to get into; those words are more difficult; we didn't even do them yet.						

Ob14	a) Song b) wrinting on iwb large space where they can write. Children out of their place to write c) new word come - go activity d) Note how trnsition of pedagofy from formal copy books near to non-linear using different mediums (in this case iwb) non-sequential (d) new word some. write it on their mini whiteboards (e) Teacher wrote instructions on iwb) PART B. Tablets. Teacher felt confident with inquiry based learning. preferred a whole classrom apprech. Used trick words							
Ob 14 1-6-2016 Ms Y 7		teacher asked the students which letter starts with that particular sound name, which subsequently they had to colour				choosing colours and letter names	Difficulty for teacher to enable collaboration	Touch screen / Transmedia
Ob15 Ms Y							Difficulty for teacher to enable	

							collaboration	
Ob5 13-4-2016 MsY video 2	An opportunity provided by the tablets was the possibility for pupils to answer quizzes constructed by the teacher							Sense of belonging / Enabling teachers to create resources
Ob 15 Ms R								
Ob 15 1-6-2016 Ms R 11								Self-Esteem
Ob 15 1-6-2016 Ms R 8.mov								Transmedia
Ob 15 1-6-2016 Ms R 6.Mov	'Zaption' used to add questions to a video created by Ms Mandy using GoAnimate. Ms Mandy created an animated video about Maltese vowels, using 'GoAnimate', and uploaded it on YouTube. Subsequently, Ms Roberta created an interactive video lesson by adding questions and text to the existing video, using 'Zaption'							Enabling Maltese Language Learning

Ob16	Using drawing desk. Writing letter and finding missing consonant e.g.g _ at Using apple TV Using twinkle phonics suit phase 1, aspect 4 Rhyping soup activity. Phse 2 Full circle activity		The pupils also exclaimed excitedly every time they got a correct answer (		Students accessed Mel's Phonics CVC lite	a Montessori approach and in this case, children were practising blended sounds.		Self-learning
Feedback	This feedback leans on the approaches in which children are perceived as active researchers and active participants during the whole process. While maintaining their own spaces in their own environment, I tried to observe the classroom not from an educator's perspective but rather that of a student. In order to capture the full context of student and learning experiences in the classroom I drew on Alison Clark's mosaic approach (Clark, 2011).				Children construct meaning from process, during the lessons			

Appendix VIII: Transcripts of unstructured interviews with teachers who were participants in this study

Unstructured Interview with Ms Mandy
16th June 2016

Interviewer: Nirringrazjak ....talli aċċettajt anke li tgħini f'din l-analiżi tiegħi wara li osservajt dawn il-klassijiet, anke nirringrazjak għax naf li taħdem magħhom dawn l-għalliema li għoġobhom anke jilqgħawni jiġifieri anke stajt nara l-ekoloġija tal-iskola, anke l-kap tal-iskola naturalment u ħassejtni milqugħ biex ngħid hekk ġo din l-iskola. Minn Frar sa — u nifhem li anke l-għalliema issa jinsabu ftit em iridu jlestu l-affarijiet għax għalkemm m'hemmx eżamijiet imma xorta jridu jagħlqu dak li għandhom anke preparat. Vantaġġ tat-tablets, għax kif taf jiena l-interess primarju tiegħek kien anke l-użu tat-tablets huwa l-portabilità, issa hawn hekk hawn kamra li tintuża għat-teknoloġija biex ngħid hekk jiġifieri fejn ħa jintużaw. Ovvjament hawn anke l-iscreen, hawn anke l-mod kif tikkomunika mal-iscreen però dawn ma jistgħux ikunu fil-klassi biex ngħid hekk jiġifieri dan — imma x'vantaġġ? Tara xi vantaġġ li t-tfal kieku joħorġu bit-tablets barra mil-kuntest ta' din il-kamra iktar milli qishom ġo computer lab biex ngħid hekk?
Participant: Eħe jien naħseb li t-tablets, ifhimni ġol-virtual room għandhom l-użu tagħhom jiġifieri ta' benefiċċju għat-tfal però meta konna tkellimna dwarha fuq din il-biċċa xogħol mal-SMT huma jiġifieri qablu li nkunu nistgħu per eżempju nużaw it-tablets għal mument jiġifieri jkun mhux mument fit-tul vouldire u jmorru per eżempju fil-klassi u tintuża hemm hekk it-tablet per eżempju jkun hemm anke wifi fejn ikunu jistgħu jużaw it-tablet jekk l-app ħa tkun b'sistema ta' wifi u jużaw it-tablet. Issa t-tablets kienu ukoll jintużaw per eżempju jekk għandhom xi ħarġa fejn huma t-tablet ħa tintuża, għandhom bżonnha per eżempju anke per eżempju biex jaqraw xi ħaġa jew inkella hemm xi logħob jew għandhom bżonn biex iħaddmu per eżempju b'xi app qed niftakar anke l-kbar per eżempju kellhom jużawha per eżempju għal Malta Junior League per eżempju, kienu ħadu t-tablet biex iħaddmu bil-We Do u x'naf jien jiġifieri huma jużaw it-tablet anke fuq ħarġa, xi ħaġa tal-iskola jiġifieri skolastika jiġifieri it-tablet kienet toħroġ minn hemm ovvjament mhux kollha jiġifieri aħna qed nitkellmu fuq tnejn jew tlieta per eżempju għax huma hemm xi tnax-il tablet jiġifieri tintuża ukoll barra mil-virtual room u tagħmel sens għaliex jekk it-teacher per eżempju trid tħaddem xi app partikolari per eżempju u kits per eżempju qed nitkellmu fuq We Do u l-kits qed tagħmilhom fil-klassi għax forsi għandha sistema kif tqegħdhom fuq imwejjed u kif ħa tqassamhom, għandha bżonn it-tablet hemm hekk. Jiġifieri umbagħad fil-virtual room m'hemmx imwejjed per eżempju huwa tajjeb li jkollha umbagħad it-tablets magħha biex umbagħad tagħmel din l-attività jiġifieri anke għaż-żgħar per eżempju anke tkun bdiet attività, qed nitkellmu fuq iż-żgħar għax fuq iż-żgħar aħna għamilna riċerka jiġifieri. Huma jagħmlu per eżempju xi attività umbagħad wara jużaw it-tablet u forsi jekk it-teacher tħossha iktar komda li t-tablet tkun magħha, l-aqwa li ovvjament tieħu permess u titkellem naqra mal-SMT li għandha bżonn it-tablet toħroġha barra mil-virtual room, ovvjament iridu jieħdu ħsieb li t-tablet tibqa' tajba għax inti dan ifhimni dawn trid tieħu ħsiebhom sewwa? U tgħidilhom lit-tfal fuq din li jridu jieħdu ħsieb it-tablet, jintużaw u jerġgħu jmorru lura fil-cupboard tagħhom fejn hemm jiġu ċċarġjati biex għal dak li jkun biex isibhom bil-lest.
Interviewer: Interessanti ħafna dan li qed tgħidli għax anke meta tarah fil-kuntest tal-iskola tibda tifhem anke dawn id-diffikultajiet ukoll, il-prezz tat-tablet naturalment mhux b'xejn, jekk jinkiser dawn huma tfal żgħar kienu ukoll jiġifieri. Ukoll anke semmejt tal-wifi, meta toħroġ barra mhux dejjem ħa ssib il-wifi, għandna xi pjazez u hekk li għandhom il-wifi però ġieli biex tikkomunika anke forsi ma jkunx daqshekk b'saħħtu ifhem u x'naf jien. Però huwa vantaġġ

kbir naħseb jiena li dejjem ikun marbut qisu mal-curriculum, jekk it-tablets ikunu fil-kamra biss fl-istess ħin jibdew qishom jarawha biċċa għodda qisha donnha lezzjoni tal-computer hux hekk?
Participant: Eżatt, hi ifhimni aħna meta nippjanaw lezzjonijiet u hekk flimkien ġeneralment aħna namalgamaw mal-curriculum eżistenti jiġifieri meta ssir lezzjoni din ma ssirx xi ħaġa apparti, xi ħaġa waħedha jiġifieri din it-teacher aħna anke biex hi ma titgħabbiex b'ħafna iktar xogħol u x'naf jien jiġifieri ġeneralment namalgamaw mal-curriculum eżistenti, minn dejjem hekk jiġifieri naħdmu vuoldire hi ħa tipprepara, nippreparaw attività ma' xi topic ġa ħa tkun ħa tagħmel umbagħad bħala additional tool li ħa tuża hi ħa tkun qed tuża t-tablets jew inkella ħa tuża per eżempju mirroring fuq l-apple tv per eżempju għax għandhom anke sistema fejn inti tista' *timmirrerja* t-tablet tiegħek għal fuq it-television, hemm television apposta. U bħala sistema tal-wifi hemm hekk hemm wifi apposta, jiġifieri ġol-virtual room jeżisti wifi li tqiegħed apposta jiġifieri biex jintuża għal mat-tablets jiġifieri dik importanti li nkunu aware tagħha ukoll.
Interviewer: Però inti fil-fehema tiegħek taħseb issibu apps li huma addattati għal dak li jkunu jridu jagħmlu l-għalliema? Għax waħda mid-diffikultajiet li qaluli l-għalliema hija li ma jsibux apps; jekk inti qed tgħallimhom per eżempju dak is-sound jew dik il-blended word jew x'naf jien mhux dejjem ikun relatat. Taħseb, biex inkunu forsi ċari, dan jista jkun anke hemm bżonn ta' bidla fit-tgħalim, fil-pedagoġija, ta' kif wieħed jgħallem? Jew hemm limitazzjonijiet ukoll li din l-għodda mhux dejjem tista' taqdik?
Participant: Ifhimni fil-fatt l-apps mhux ħa ssibhom kollha adhoc ta' kif tridhom jiġifieri dak jekk nitkellmu fuq il-malti per eżempju apps bil-malti huma ftit jiġifieri hemm jiġifieri bħal issa imma m'humiex kollha available anke fuq ipads sewwa? Jiġifieri dawk anke konna ċċekjajna vouldire hemm minnhom li huma iktar fuq android u hekk jiġifieri bħala app però t-teacher anke mhux app jiġifieri tista' tuża t-tablet mhux bħala app biss, tista' tuża t-tablet per eżempju billi tuża website jiġifieri inti għandek faċilita mit-tablet, tidħol fuq online website jiġifieri, minn ġot-tablet stess u bħala app jekk qed nitkellmu fuq app trid tagħżel x'tip ta' app per eżempju jekk tkun naqra open per eżempju qed nitkellmu bħal app l-Educreations per eżempju jew inkella Drawing Desk, dawn huma kollha apps fejn it-teacher per eżempju jekk qed tagħmel l-ittri, jekk qed tagħmel numri hi ħa jkollha karta bajda jiġifieri huma t-tfal ħa jiktbu per eżempju xi ħaġa li hu ħa jirrekordjaw lilhom infushom, xi storja per eżempju jew ħa jpinġu jiġifieri huma mhux eżattament l-app lesta u kemm jiena nilgħaba jiġifieri hemm apps, hemm tip ta' apps u tip ta' apps jiġifieri t-teacher qisha umbagħad tiddiskuti magħna s-support x'tixtieq waqt il-lesson jiġifieri x'inhi tfittex umbagħad aħna qisna nissuġerixxu x'tip ta' apps x'tista tuża waqt il-lezzjoni.
Interviewer: Fil-fatt innutajt anke dan l-isforz anke li jużaw dan l-open ended app, ma nafx jekk hux minħabba bidla fil-motivazzjoni biex l-għalliema forsi tibdel it-tagħlim jew inkella għar-raġun anke kif qed tgħid anke inti li hemm jistgħu jaqdik aħjar għal dak li tixtieq tagħmel fil-lezzjoni. Però nsaqsik ukoll anke fuq l-apps l-oħrajn, more off the shelf, li huma closed, iktar magħluqin, dawn għandhom ukoll xi vantaġġi tagħhom jiġifieri għandek sounds tajbin, iktar forsi professjonali mil-prodott li tista' toħloq l-għalliema biex ngħid hekk, forsi nsaqsik xi ħaġa fuq hekk ukoll. Però biex namalgama ftit magħha xi għalliema ukoll jippreferi, innutajt illi jkantaw mat-tfal, jirrepetu, jirrepetu anke dak il-ħoss pertinenti, ħoss tax-'x', ħoss taċ-'ċ'; kif tarah l-bżonn, dak li jagħmlu l-għalliema huwa aħjar mill-app jew l-app hija aħjar minn dak li qed jagħmlu l-għalliem jew hemm bżonn tat-tnejn?
Participant: Le fil-fatt ifhimni l-istudju kien qed isir fuq snin bikrin jiġifieri qed nitkellmu fuq tfal ta' età żgħira sewwa? Allura jiġifieri inti trid tibda bħala anke jiena għalliema ta' tfal ta' età żgħira kont qabel jiġifieri trid tibda vera mil-bidu jiġifieri jien naħseb li l-affarijiet li qed jagħmlu l-għalliema, l-affarijiet li għandna bħal dawn it-tools bħat-tablets, l-Interactive Flat Panel whatever jiġifieri dawn l-għodod kollha li hemm dawn huma jmorru id f'id mat-tgħalim

li qed tagħmel l-għalliema. Jiġifieri inti ma jfisserx li għax aħna daħħal għodod ġodda bħal dawn it-tablets u l-affarijiet l-oħra, l-affarijiet l-oħra li konna nagħmlu qabel ħa jispiċċaw. Le, jfisser li t-tfal għandhom bżonn li t-tgħalim ikun qiegħed hemm u li t-teacher għandha tirrepeti u dan għax hemm bżonn ħafna repetizzjoni speċjalment meta jkunu tfal għadhom żgħar u ma dawn biex inti tkun iktar attraenti, kif qed ngħidu l-apps li bdejna nsemmu huma ħafna ikkuluriti, huma ħafna animati, għandek graphics sbieħ jiġifieri allura t-tfal iktar ħa jibqgħu jiftakru xi ittri per eżempju, xi numri allura inti qisek qed tissoda t-tgħalim tiegħek billi tuża qishom affarijiet diġitali mat-tgħalim li ġa kont qed tagħmel.

Interviewer: Ir-rwol tal-għalliema jibqa dejjem anke wieħed importanti, ikun xi jkun jiġifieri finalment l-għalliema qed iħejji anke t-tfal kif anke jkollhom it-tablets tagħhom naħseb hux hekk? Jistgħu jużaw dawn it-tablets anke d-dar, qed jedukawhom b'dan il-mod.

Participant: Eżatt għax id-dar jiġifieri dawn it-tfal huma esponuti bħal issa f'din l-era diġitali li qegħdin ngħixu fiha t-tfal bħala dawn id-digital citizens li huma tielgħin huma l-ħin kollhu huma esposti għal tablets, smartphones u x'naf jien allura dawn ġa qishom mid-dar qed ikunu ġa jafu kif per eżempju jħaddmu ċerti apps u hekk jiġifieri dan; umbagħad l-iskola għandhom dan it-tgħalim u l-għalliema qed tarrafhom mhux biss kif tuża per eżempju t-tablet bħala mod biex tilgħab biss, logħob biss imma kif tista' tużaha b'mod edukattiv.

Interviewer: Vantaġġ ieħor, ma nistax nsaqsik, ma nsaqsikx dwarhu huwa tat-touch screen, it-touch screen huwa vantaġġ tat-tablets biex ngħid hekk jiġifieri iktar evidenti però fl-istess ħin għalkemm għandek dan it-touch screen hemm fuq in-naħa l-oħra tal-munita għandna lezzjonijiet jien naf li t-tfal jistgħu jużaw xi ħaġa iktar tanġibbli eżempju ż-żebgħa, l-għalliema anke milli nnutajt hawn hekk forsi jippreferu ġieli jużaw anke markers, sempliċement il-marker jew anke l-felt li t-tfal jmissu l-felt. Kif tarah dan jikkombinaw flimkien ukoll l-istess qisha mistoqsija bħal qabel, jew iktar li t-tablet mhux qed jilħaq l-għanijiet allura tiegħu daqs kemm naħsbu bit-touch screen?

Participant: Le għalija huwa f'dan iż-żmien partikolari ta' età żgħira fejn it-tfal huma l-ħin kollhu qed jiżviluppaw huwa mportanti anżi li jkollhom hands on activities fejn it-tfal jmiddu jdejhom speċi f'attivitajiet tanġibbli anke l-fine motor skills tagħhom, għandek ħafna logħob qishom fejn huma jiktbu fir-ramel, jagħmlu l-plasticine per eżempju f'forma ta' ittri u dawn il-logħob huwa parti mid-development tagħhom jiġifieri ma nistgħux naqtgħu kompletament dan il-logħob biex speċi umbagħad nagħtu ċans għal iktar — le jiena naħseb li dawn għandhom imorru id f'id jiġifieri t-tfal għandhom jiġu esposti, jkollhom ċans għal dan it-tip ta' attivitajiet kif ukoll b'affarijiet, nużaw affarijiet diġitali ukoll.

Interviewer: Tema oħra mportanti għalkemm m'hijiex relatata biss mat-tablets imma t-tablets naħseb jistgħu jilħquha hija kollaborazzjoni bejn it-tfal, anke t-tfal jikkolaboraw ruħhom. Ma nistax ngħid li as such rajt kollaborazzjoni, ovvjament nifhmu ukoll li dawn huma tfal anke żgħar però ukoll teżisti kollaborazzjoni bejn it-tfal żgħar forsi titlob ukoll anke studju ieħor biex inkunu ċari anke l-kollaborazzjoni anke d-diskors li qed jingħad bejn it-tfal u x'tip ta' diskors, kwalità tad-diskors, l-iktar li jinteressani iktar milli fuq id-diskors eċċetera, eċċetera taħseb li din it-tablet jgħinu? Il-kollaborazzjoni bejn it-tfal?

Participant: Ifhimni iktar ma jikbru, kif għedt inti meta jkunu forsi naqra iktar età naqra iktar avvanzata, t-tfal jkun hemm ħafna attivitajiet fejn jistgħu jagħmluhom fi gruppi per eżempju qed tiġini f'moħħi anke meta jkunu għadhom żgħar ta jiġifieri tista tagħmel tip ta' attivitajiet fejn jinħolqu group work. Issa per eżempju qed nagħtu mod tal-kelma jagħmlu per eżempju ħa jagħmlu storja, jien naf xi ħadd jibda jpinġi xi ħaġa l-ieħor ħa jitkellem, ħa jgħid xi kelma per eżempju ħa jiġi rrekordjat u l-ieħor ħa jagħmel il-kulur u nsomma. Jistgħu flimkien jagħmlu, jikkrejaw din l-istorja per eżempju jiġifieri dawn jistgħu joqgħodu fi grupp u ovvjament bl-għajnuna tal-għalliema għaliex huma għadhom żgħar u joħolqu per eżempju xi tpinġija jew ġieli rajna per eżempju xi ħaġa li tista' ssir, ġieli għamilniha fi proġetti aħna per eżempju li jibda tpinġija grupp umbagħad jitkompla jiġifieri qed nitkellmu fuq digital books

per eżempju fejn jibdiha grupp u l-istess ktieb jinfetaħ umbagħad fuq tablet oħra fejn inti tpinġija per eżempju, din ġrat anke ma pajjiżi barra minn Malta. Darba qed niftakar proġett partikolari fejn din bdejna storja ta' ħuta li kienet iddur il-Mediterran per eżempju, kienet tiġi Malta umbagħad iddur il-pajjiżi l-oħra, issa t-tfal kellhom, il-grupp ta' Malta jpinġi x'qalet il-ħuta meta ġiet per eżempju hawn Malta umbagħad l-oħrajn ikomplu l-pages l-oħrajn u qisha qed jagħmlu storja b'mod kollaborattiv. Jiġifieri dan huwa eżempju kif tista' ssib kollaborazzjoni, hemm ħafna tip ta' attivitajiet jekk taħseb naqra kif tista' tuża t-tablet jistgħu jsiru collaborative jiġifieri din hemm naqra ħsieb fuqha u tifthiem naqra mat-teacher u hekk, tara naqra x'għandha f'moħħha biex umbagħad irridu naraw naqra l-curriculum ukoll u naraw kif ħa jidħol naqra dan il-collaboration waqt l-attivitajiet.

Interviewer: Ovvjament il-kollaborazzjoni hija xi ħaġa anke fiha nnifisha u anke l-għalliema trid tkun anke preparata speċjalment minn età daqshekk bikrija fejn anke t-tfal ikunu għadhom qed jikkomunikaw, qed jitgħallmu jikkomunikaw ukoll jiġifieri hija fiha nnifisha taħriġ kważi kważi, jmur anke lil hinn mit-tablets biex ngħid hekk biex tikkoordina b'dak il-mod. Nirringrazjak tal-ħin tiegħek u anke li għażilt li anke tgħini però mistoqsija l-aħħar waħda naħseb li suppost bdejt biha, ir-rwol tiegħek? Ir-rwol tiegħek ta' support teacher, jien ukoll support teacher però ovvjament minħabba talbiet, rikjesti differenti x-xogħol tiegħi huwa differenti huwa fuq it-tqassim iktar milli dan bħal issa tal-hardware fuq l-organizazzjoni tal-hardware, x'inhu x-xogħol tiegħek eżatti fl-iskola bħala support teacher ġo l-iskola?

Participant: Issa aħna ovvjament aħna jkollna ċertu skejjel jiġifieri fejn aħna nkunu ta' sapport kemm għall-għalliema kif ukoll kif jiġifieri ngħinuhom aħna kif ħa ndaħħlu għodod diġitali u kif jistgħu jintegraw fil-curriculum eżistenti kif għedna jiġifieri aħna nagħmlu anke sessjonijiet magħhom kemm mat-tfal jiġifieri biex nuruhom naqra kif nistgħu nużaw ċerti għodda waqt il-lezzjonijiet sewwa? Nagħtuhom anke training lit-teachers, il-curriculum time fejn inti qed tgħallem l-għalliema kif inti tista' tuża ċerti għodod fil-klassi u ċerti pedagoġija b'mod diġitali jiġifieri u aħna ukoll inkunu per eżempju in kuntatt mal-SMT fuq affarijiet li huma għaddejjin bħal proġetti, hemm ħafna jiġifieri affarijiet li jkunu għaddejjin matul is-sena bħal l-EMBED, l-eTwinning, xi Robotic League per eżempju jiġifieri jkun hemm ħafna affarijiet li jkunu għaddejjin fejn aħna umbagħad qisna fl-iskola qisna anke nħeġġu lit-teachers jipparteċipaw f'tip ta' proġetti per eżempju bħal l-eTwinning per eżempju u anke ngħinuhom speċjalment anke fit-tablets per eżempju bħal din fil-virtual room kif għandna fil-Belt, aħna nagħtu jiġifieri, jiena nagħti s-sapport tiegħi biex l-għalliema ma tkunx waħedha biex tkun taf naqra kif għandha tuża din il-kamra virtwali u kif ħa tuża t-tablets waqt il-lezzjonijiet. Jiġifieri aħna niddiskutu magħhom kif jistgħu jużaw dawn l-għodod li hemm available f'din l-iskola, jiġifieri f'din il-kamra li hemm available fejn huma jistgħu jiġu hemm hekk jew inkella ħa jagħmluha fil-klassi u kif ħa jużawhom waqt il-lezzjonijiet jiġifieri aħna nkunu ta' sapport kontinwu matul is-sena.

Interviewer: Nirringrazjak għal darb'oħra talli lqajtni anke f'din u vera proset għax vera għax anke milli rajt anke jekk hu biss l-entużjażmu tal-għalliema li xtaqu anke jaħdmu fuq din — dan mhux qasam ġdid ukoll jiġifieri mhux xi ħaġa li tgħid ilha ħafna lanqas u l-fatt li anke urew l-entużjażmu huwa ukoll grazzi għax-xogħol f'tiegħek anke f'din l-iskola, grazzi ħafna.

Unstructured Interview with Ms Mandy translation

Interviewer: I thank you …. for accepting to help me in my analysis after observing these class rooms, I also thank you for working with these teachers who have welcomed me in their classroom where I could experience the school ecology, even the head of school, and I have to say that I felt very welcomed in this school. Since February – and I understand that even the teachers want to finish off the tasks because even if there are no exams they still want to finish what they had prepared. An advantage of the tablet, since as you know my primary interest of the use of tablets is the portability. Now here you have a room which is used for technology related purposes so to say, meaning where the tablets are going to be used. Obviously there is also the screen, this can be used as a method of communication too but these cannot be in class so to say, so what advantages are there? Do you see it as an advantage if the children were to go out with the tablets, outside this room rather than being in a computer lab so to say?
Participant: Yes, I think the tablets – let's be clear about this, inside the virtual room the tablets have their use so they are beneficial to the children however when we talked about this to the SMT they also agree that we can use the tablets for a while, not for a long while, and go for example in their classroom and the tablet can be used there. For example there is a Wi-Fi connection if the app they are going to use requires Wi-Fi and they can use the tablet there. The tablets were also used for example if they had an outing where the tablet could be used for example to read something on it or there are some games or there is an app that they need. Something that comes to mind is that the older children for example needed the tablet for the Malta Junior League, they took the tablet with them to use the We Do and so on, so they can use the tablet even on an outing, something school related so the tablet was used outside the Virtual room however not all of the tablets obviously. We are talking about two or three for example because there are about twelve tablets, so the tablet is also used outside the Virtual room and it makes sense because if the teacher wants to use a particular app and some kits, for example if we talk about the We Do and the kits these are done in the class room maybe because she has a system of how to place the tables and how to place them in groups and she needs the tablets. In the virtual room there are no tables so in this case it is important that she has the tablets with her so that she can do this activity, even with the younger children, for example she started an activity, I'm talking about younger children because we did a research on the younger ones. They do for example an activity and then they use the tablet and if the teacher feels more comfortable to have the tablet with her, as long as she has permission from the SMT to take the tablet outside the Virtual room and as long as they take care of the tablets because you have to take care of them in order for the tablets to work properly right? And that the children are aware that they have to take care of the tablet and once used they need to be placed back in their cupboard where they can then be charged so they are up and running for who is going to use them next.

Interviewer: What you're saying is very interesting because when you see it within the school contest you can understand the difficulties too like the price of the tablet, which obviously is not cheap should one of them be damaged because after all they are young children. You also mentioned the Wi-Fi, when you take the tablet outside you will not always find a Wi-Fi connection, we do have some town squares where there is a Wi-Fi connection however at times the signal is not very strong and so on which makes it difficult to connect. However I think it is a great advantage if the tablet is used in conjunction with the curriculum because if the tablet is only used in this room the children might see it as a tool which is only used during a computer lesson right?

Participant: Correct, let's be clear, when we plan the lessons together generally we incorporate it with the existing curriculum meaning that when the lesson is held this is not something done separately, on its own. This is done so that we do not add more work to the teacher so we generally incorporate it with the existing curriculum, it has always been done like that, we prepare the activity along with a topic that she is already going to do and as an additional tool she can use the tablet or for example the mirroring on the apple TV because they also have this type of system where you can mirror the tablet on the television, there's a dedicated television for this. As for the Wi-Fi there is a dedicated Wi-Fi connection on purpose so in the virtual room exists a WI-FI connection that its sole purpose is to be used by the tablets, that is something that we should be aware of.

Interviewer: In your opinion do you think you can find suitable apps for the teachers' requests? Because one of the difficulties that they mentioned is that they don't find much apps; for example if they are teaching a particular sound or a blended word they are not always to find a related app. Do you think, to be clear about this, that there needs to be a change in the way we teach, in the pedagogy of how one teaches? Or are there limitations which this tool cannot help you with?

Participant: Let's be honest, there aren't apps that you can find adhoc of how you exactly want them so if we talk about Maltese for example, apps in Maltese are quite few and some of them are not even available on iPads. We had also checked about these and there are more compatible with Android as an app however the teacher can use the tablet not just for the apps but for example they can use it for a website because by using the tablet you have the facility to go online on certain websites from the tablet itself. If we talk about apps you need to choose what kind of app for example if it's an open app like the Educreations or Drawing Desk, these are all apps where the teacher can do the letters or numbers because she has a blank screen and the children can for example write something or an app where they can record themselves, for example a story or they draw something. So they don't need a particular app exactly and just play it, there are some kind of apps and other kind of apps so the teacher discusses with us, the support team, about what she wants during the lesson, what she is looking for and then we suggest what kind of app's she can use during the lesson.

Interviewer: In fact I noticed this effort to try and use open ended apps, not sure if it is because there is a change in the teachers motivation to change the way she teaches or else because as you mentioned these are better suited to reach the lessons goal. I wanted to ask you about other apps, more off the shelf ones which are close ended, these also have advantages because you have really good sounds, more professional than a teacher can create herself so to say so I wanted to ask you about this. I also want to add to this that certain teachers also prefer to sing along with the children, to repeat certain pertinent sounds for example the 'x' sound, the 'ċ' sound, how do you see this need – what the teachers do is better than the app or is the app better than what the teachers do or is there the need of both?

Participant: No, in fact the study was being conducted on early childhood students, students of a young age right? So you need to start, even I as a teacher for early years used to start from the very beginning so I think that the methods the teachers are using, the tools we have such as the tablets, the Interactive Flat Panel and so on, all these tools go hand in hand with the teaching methods that the teachers are using. Therefore it doesn't mean that because we are using these new tools like the tablets then the other teaching methods are going to cease to exist. No it means that the children need the teaching methods currently in place with a lot of repetition because there is the need of repetition especially when the children are very young and along

with these, to make teaching more attractive, the use of apps as we mentioned before, there are a lot of colourful and animated ones, you have great graphics so the students will remember certain letters for example or certain numbers so you are enforcing what you are teaching by using digital tools along with the teaching methods you were already doing.

Interviewer: The role of the teacher remains always an important role, whatever the case it is always the teacher that prepares, even when using the tablets I think right? Can they also use the tablets at home to educate themselves in this way?

Participant: Exactly because at home these children are exposed to a lot of digital tools since we are living in a digital era and these children are like digital citizens where they are always exposed to tablets, smartphones and so on so from home they are already learning how to use certain apps and then at school they have this kind of learning method and the teacher is guiding them not just on how to use the tablet to play a game but on how to use the tablet as an educational tool.

Interviewer: Another advantage, I cannot not ask you this, is the touch screen. The touch screen is an advantage of the tablets so to say but on the other hand we have lessons where the students can use more tangible things for example paint, some teachers even like to use markers or felt where students can touch the felt. How do you see this combined together, similar to my previous questions, is the tablet reaching its goal as much as we think?

Participant: No, for me at this particular age where the children are all the time developing it is important that they have hands on activities where the children have hands on activities, more tangible, even for their fine motor skills you need more play like writing in the sand or use the play dough to form letters since these activities are part of their development so we cannot stop using these kind of activities. No, I think these go together meaning that the students need to be exposed and have time for these activities together with digital tools.

Interviewer: Another important theme, although not related only with the tablets, is the children's collaboration. I cannot say as such that I have seen a collaboration, we have to understand that these are young children, however it exists a collaboration between young children maybe this requires another study to be clear, even the talk between the children, the quality of the talk but the most that interests me more than the talk is do you think the tablet helps? The collaboration between children?

Participant: The older they get, as you said when they are a bit older, there are more activities where they can work as a group for example one that comes to mind even when they are young you can do activities that require team work. For example if they are assigned a task to write a story, maybe someone starts to draw something, another one is going to talk, someone is going to record the other child who is talking and another is going to colour the drawing so to say. Together they can create this story for example and they can work as a group obviously with the help of the teacher since they are still quite young and for example create a drawing. We have also seen for example, we did this in a project where a group starts a drawing and then it is continued, we are talking about digital books for example where one group starts and the same book is then accessed from another tablet and it is continued, this happened together with other countries. One particular project that comes to mind is where we started a story of a fish that was going around the Mediterranean Sea, it came to Malta and then moved on to other countries. The children, the Maltese group had to draw what the fish said when it came to Malta and the others continued the next pages and they collaborated together to make this story. So this is an example of how students can collaborate, there are a lot of activities if you

think in which ways you can use the tablet, it needs some though and liaising with the teacher to see what she has in mind and then we need to see the curriculum and see how we can use this type of collaboration during these activities.

Interviewer: Obviously the collaboration is something that the teacher needs to prepare for especially with students at such a young age where even the students are still learning how to communicate so this goes beyond the tablets so to say to coordinate in this way. I thank you for your time and that you have agreed to help me however one last question that I should have started with, your role? Your role as a support teacher, I'm also a support teacher however as per some requests my work is different, my work is more related to distributing hardware, organization hardware. What is your role exactly as a support teacher within the school?

Participant: We obviously have a number of schools, so we support the teachers and help them on how to integrate the digital tools with the existing curriculum. As we said we make sessions with them even with the children in order to show them how to use certain tools during a lesson right? We provide training to the teachers during curriculum time where you are teaching a teacher on how to use a certain tool in class and certain pedagogies in a digital way and we are also in contact with the SMT on ongoing projects, there are quite a few such as EMBED, eTwinning, Robotic League for example so there are a lot of things going on. We try to encourage teachers to take part in these projects for example the eTwinning and we even help them especially with the tablets for example in the virtual room that we have in Valletta we give the support to the teachers so that they are not alone when using the virtual room, on how to use it and how to use the tablets during the lessons. So we discuss with them on how to use these tools that are already available within the school, in this room that they have available where they can come there or do the lesson in their own classroom and how to use them during the lessons so we are continuously supporting them throughout the scholastic year.

Interviewer: I thank you once again for welcoming me and a very well done because from what I have seen even if it is only the enthusiasm shown by the teachers that they want to take part in this, this is not a new sector but not an old one either and the fact that they showed enthusiasm is also thanks to your work within this school, thank you.

Unstructured Interview with Ms Roberta
20th June 2016

Interviewer: Grazzi .... u nirringrazjak anke għal dawn il-ġimgħat li anke aċċettajt li anke dħalt fil-klassi tiegħek, ilna għaddejjin issa minn Frar, rajt it-tfal, rajt il-mod kif anke inti tgħallem u għalija kienet esperjenza nista' ngħidlek ukoll li anke rrispettivament minn din ir-riċerka kbirt ħafna anke jien, kbirt ħafna minnha jiġifieri għax rajt ħafna affarijiet oħra anke fil-klassi. Il-focus kif taf inti huwa fuq it-tablets jiġifieri -- u naf li anke pruvajt anke almenu minn dan l-esperiment, minn dan li kellna hawn hekk jiġifieri ħadt l-okkażjoni anke biex anke tkompli tespandi anke l-dik tiegħek fuq hekk jiġifieri. Qed ngħid hekk għax ovvjament it-tablets huma xi ħaġa ġdida u la għandna riċerka dwarha imma però tara l-possibilità tagħha. Hawn hekk hawn din il-kamra li qegħdin fiha, din il-kamra fejn jiġfieri tintuża għat-tablets u hekk, inti kont tibda l-ewwel parti kont tibdiha fil-klassi.
Participant: Ħafna mid-drabi l-lezzjoni kienet tibda fil-klassi biex it-tfal anke jkunu ħadu idea tal-lezzjoni fejn sejra u xi jrid ikun, x'ħa jiġri s-suġġett ukoll umbagħad konna nużaw it-tablet biex qisha tgħin ħafna iktar mal-lezzjoni u namalgamawha flimkien. L-ippjanar kien ikun jiġifieri kemm b'mod hands on imma ukoll konna ndaħħlu t-teknoloġija fiha biex it-tfal jesploraw iktar il-mod ta' kif jistgħu jitgħallmu b'modi differenti kemm id-dar u kemm l-iskola biex ngħidu hekk.
Interviewer: Jiġifieri mat-tablet torbot anke li qisek minn hawn hekk qed jitgħallmu anke kif it-tfal qed jużaw t-tablet anke d-dar b'xi mod, joħdu l-idejat anke ta' software eċċetera.
Participant: L-ideja kienet jiġifieri li l-fatt li t-tablet iddur kullimkien, it-tablet m'hijiex qegħda hemm hekk biss biex nilgħab imma nista' nużaha ukoll biex nitgħallem u allura l-iskola konna qed nuruhom varjazzjoni differenti ta' apps u programmi differenti li minnhom jistgħu jitgħallmu u forsi anke d-dar waqt li qegħdin jilgħabu bit-tablet, iktar milli jilgħabu biss jistgħu ukoll jitgħallmu.
Interviewer: Fil-fatt anke nnutajt ħafna li ħafna drabi kienu jużaw apps li huma tajbin ħafna għax huma lesti bħala apps, għandhom ħafna ħsejjes eċċetera, eċċetera u jkun hemm ħafna qisu testing, self learning jiġifieri r-rwol mhux dejjem qed jisimgħu b'mod b'dak il-mod imma jkun hemm dak is-self learning li t-tfal qed anke jitgħallmu jew autonomous learning insomma t-tfal qed jitgħallmu waħedhom. Inti x'taħseb dwar dan? Jiġifieri tarah bħala vantaġġ?
Participant: Naturalment l-applications ma kienux qed ikunu hemm hekk bl-addoċċ jiġifieri kont nagħmel ħafna ħin ta' tfitxijja, ħafna application li ssib u inti tagħżel minnhom jiġifieri ma ġewx hemm hekk kumbinazzjoni. L-affarijiet kollha li jkunu għamlu t-tfal, il-logħob kollhu li jkun sar kont nuża ħafna ħin, kont nagħmilhom anke jien minn qabel kont niċċekja anke l-logħoba x'jiġri jekk tifel jġib risposta ħażina jew inkella x'ħa jiġri, kien hemm applications minnhom li mhux biss kienu self learning fis-sens li l-application tgħidlek x'inhu tajjeb u ħażin imma kien hemm oħrajn ukoll li kienu jtuk rendikont tat-tfal x'ġabu tajjeb u ħażin u allura jiena bħala għalliema kien ikolli bħal assessment sheet tat-tfal x'għamlu tajjeb u x'għamlu ħażin.
Interviewer: Insaqsik mistoqsija forsi ftit antipatka, jeżistu ukoll dawk li huma applications open ended, dawn ġieli l-kwalità li inti tar-riżorsa tiegħek ma tkunx tajba daqs tant daqs l-apps l-oħrajn, l-għanijiet huma differenti kompletament, taraha diffikultà forsi, ħa nkunu ċari, ħin? Anke biex tipprepara r-riżorsa, mhux dejjem tkun ta' kwalità? Kif taraha għax mil-banda l-oħra umbagħad dawn it-tip ta' apps ituk l-opportunità ukoll li inti tista bihom tilħaq iktar dak li għandek f'moħħok, dak li għandek lest kif qed tgħid inti għandek ħafna tfittxija li tieħu ħafna ħin ukoll.
Participant: Naturalment, inti l-fatt li għandek it-tablet bħala riżorsa extra għandha l-ħin tagħha, trid tfittex ħafna iktar, trid tipprova iktar, inti ma tistax twaddab application, togħġbok,

taħseb li hi tajba, tpoġġiha hemm u daqsekk imma trid tittestjaha, trid tara x'tagħmel, tara l-pros u l-cons tagħha. Jekk għandek umbagħad applications fejn inti trid tinputtja minn naħa tiegħek il-mistoqsijiet naturalment għandek iktar tfittxija, trid tikreaha inti, qed toħodlok iktar ħin, toħodlok il-ħin ukoll biex titgħallem tużaha jiġifieri hemm ħafna -- il-ħin huwa li hu jiġifieri l-ippjanar jieħu l-ħin jiġifieri hemm ħafna affarijiet li minn naħa tiegħek trid tipprepara minn qabel. Dan mhux bħal meta għandek pitazz u forsi użajtu ġietek ideja dak il-ħin, naturalment fl-application trid tipprepara minn qabel inti però meta tara t-tfal kemm jieħdu pjaċir inti qed umbagħad tipprova tibbilanċja bejn wieħed u ieħor. Il-fatt li kellna tifla ukoll li ma kienetx issegwi l-lingwa Ingliża kienet tagħmel biss Malti dan ukoll ħoloq problema għaliex ħafna drabi applications bil-Malti ma kienx hemm diġa lesti, ma kienx hemm li diġa tista ssib lesti u tużahom allura trid tikkreja inti. Meta trid tikkreja inti bil-font tal-Malti mhux kull application kienet ittik iċ-ċans li tikkreja bil-font tal-Malti u allura dejjem il-limitazzjoni tiżdied qisu però naturalment inti tipprova tara x'hemm tajjeb u taħdem fuq it-tajjeb ma tħarix biss lejn in-negattiv jiġifieri tipprova ssib bilanċ bejn kollox. Naturalment sfidi kien hemm, ħin kien hemm però meta tara l-proġett b'mod ħolistiku tiegħu l-fatt li anke kienet klassi kemm xejn iktar ċkejkna mhux bħal klassijiet oħrajn fi snin differenti kemm ilni ngħallem li tara gruppi differenti kienet tagħmel differenza ukoll. Il-grupp li kien ċkejken jgħin ħafna ukoll jiġifieri t-tfal kellhom iktar attenzjoni u kulħadd seta jaħdem bil-pass tiegħu, naħseb l-isbaħ ħaġa fiha kollha f'self learning li kulħadd kellhu self development at his own pace biex ngħiduha bl-Ingliż allura naħseb li kulħadd kellhu l-isfida personali u ma kienx hemm għalfejn wieħed jikkumpara mal-ieħor jew jikkompeti mal-ieħor. Il-fatt li kien hemm biżejjed devices għal kull tifel kulħadd seta jaħdem bil-mod tiegħu. Meta pruvajna naħdmu bħala team work naturalment it-tfal kellhom l-isfidi differenti biex umbagħad jaħdmu f'team work, f'dan il-każ ma kienx hemm din il-bżonn għaliex kulħadd kellhu device għalih u naħseb li t-tfal għenithom l-ideja għax għalihom kienu qegħdin jilgħabu u jitgħallmu bla ma jafu sa ċertu punt u l-fatt li t-tablet jew inkella l-IT b'mod ġenerali huwa self correcting mhux bħal l-għalliema li trid toqgħod tgħidlek ieqaf jew ħassar jew irranġa, it-tfal ħa jitgħallmu iktar għaliex waħedhom qed jirrealizzaw li ma jistax jagħmilha ħażina. Biex timxi l-quddiem trid tagħmilha tajba u allura huma stess kienu qegħdin jippruvaw jagħmlu l-aħjar tagħhom u l-almu tagħhom b'mod aħjar u naħseb li kienet qed tgħin ħafna f'dan il-mod.

Interviewer: Fil-fatt inti semmejt ħafna vantaġġi, semmejt anke żvantaġġi ovvjament illi bħal ma hija tal-Malti li għalkemm hemm numru ta' limitazzjonijiet u dawn l-off the shelf apps ma jkunux bil-lingwa Maltija; vantaġġ ieħor li qiegħed hemm hekk huwa li barra li qed jisimgħu jistgħu jmissu t-tablet u dan anke kien hemm il-lezzjoni tal-kliem per eżempju qed jiktbu, qed iħossu u jiktbu l-kelma daqs li kieku qed jiktbuha fuq -- tissimula kważi kważi qed jiktbuha fuq materjal ieħor jien naf fuq ramel eċċetera għalkemm forsi mhux b'daqsekk effettiv. Ġieli però innutajt li anke fil-klassi użajt il-magnetic boards per eżempju, kien hemm il-kalendarju li huwa bil-felt, kif tista' tqabbel dawn li huma non digital mad-digital? X'vantaġġi taralhom iktar minn forsi t-tablet?

Participant: Il-fatt li din hija klassi tal-Year 1 u allura kellhom bejn ħames u sitt snin għalihom il-fatt li jmissu, is-sens of touch huwa mportanti għalihom jiġifieri kien importanti fl-opinjoni tiegħi li jaraw materjali differenti u textures differenti. Kien hemm mumenti fejn użajna l-magnetic boards, kien hemm mumenti fejn użajna ukoll ittri tal-plastic biex ngħidu hekk għax huma jistgħu jħossu affarijiet differenti però l-ideja tal-lezzjonijiet kollha kienet li għaqqadna kollox flimkien. Li mhux it-tablet biss jew il-hands on biss imma għaqqadna kollox flimkien biex hekk tirrealizza li l-istess ħaġa tista titgħallimha b'mod differenti. Jiena nemmen li l-fatt li t-tfal qed jgħixu f'dinja diġitali llum il-ġurnata kienet tkun nuqqas jekk ma konniex intuhom l-opportunità li jużaw ukoll l-ICT mhux biss permezz ta' tablet għaliex aħna għamilna ħafna xogħol fil-klassi u l-lezzjonijiet isiru ukoll bil-board interattiv allura nimmaġina, naħseb jiena li l-fatt li tajnihom ftit minn kollox tajnihom esperjenza vasta ta' x'jistgħu jaraw. Dawn għada

pitgħada ma' tistax tgħid x'inhu x-xogħol li ħa jkunu fih jiġifieri tajjeb li tajnihom, esponejnihom għal ħafna affarijiet differenti u kellhom iċ-ċans imissu b'mod differenti. Il-fatt li kien hemm anke żewġt itfal partikolari li kellhom bżonn għajnuniet speċjali għaliex huma ukoll għandhom bżonn daqqa t'id iktar personali, b'LSE per eżempju naħseb li tajnihom ukoll ċans jiżviluppaw fil-ħiliet tagħhom ukoll allura naħseb li missejna ma ħafna ħiliet differenti, it-tfal ma żammejnihomx lura, kull min kellhu fejn jimraħ tajnih fejn jimraħ u allura l-fatt li bdilna bejn affarijiet tanġibbli u affarijiet li huma iktar magħmulin ma screen hekk kellhom iċ-ċans u l-opportunità qishom jaraw it-tnejn li huma u naħseb li t-tnejn li huma kienu effettivi fil-verità għax kienu magħqudin flimkien.

Interviewer: Il-fatt li hawn hekk kif qed tgħid inti, għalkemm il-klassi kienet żgħira daqsxejn żgħira l-klassi li għandek din is-sena però hawn ukoll kien hemm ġiex sfidi jiġifieri kien hemm persuna li jkollha bżonn l-għajnuna minħabba smiegħ, il-fatt li jiġu hawn hekk forsi s-setting jinbidel ma jibqax daqshekk formali, dik taraha sfida jew kienet opportunità oħra li jien naf setgħu jużaw dan xi ħaġa oħra?

Participant: It-tfal minn naħa tagħhom kienu jieħdu pjaċir il-fatt li jbiddlu l-ambjent jiġifieri għalihom kienet xi ħaġa to look forward to, kienu jħarsu lejha b'entużjażmu ejja ngħidu hekk. Nemmen li t-tgħalim m'għandux bilfors ikun fil-klassi u allura l-fatt li anke ħriġna mil-klassi u tajnihom ambjent differenti fejn qagħdu f'mod mhux formali, fuq cushion forsi qagħdu iktar komdi, it-tgħalim ġie iktar b'mod ta' gost qisu iktar milli mod ta' bilfors u allura naħseb li l-fatt li l-application per se kienet qed iġġgħalhom jitgħallmu bilfors imma finalment kienu qegħdin jilgħabu u kienet f'forma ta' logħba kienu qegħdin jitgħallmu ħafna iktar mingħajr ma jkunu qegħdin jirrealizzaw li qegħdin jitgħallmu u allura naħseb li hija xi ħaġa li twassalhom il-quddiem fil-ħajja għax fil-ħajja ħafna drabi titgħallem għax tiġi bżonn u naħseb f'dan il-każ il-fatt li l-application ma kienetx tħallik tmexxi l-quddiem jekk inti ma tagħmilx r-risposta t-tajba allura kienu qed jirrealizzaw l-bżonn li inti verament titgħallem u tiftakar u allura timxi l-quddiem u naħseb li l-ambjent għen għax huma għalihom kienet xi ħaġa ta' gost. Kienu jħarsu lejha naqra mhux ħażin jiġifieri kienu jfittxuha, kienu jistennewha minn lezzjoni għall-oħra u naħseb li kienu jieħdu pjaċir anke l-fatt li l-lezzjoni tinqasam, għalihom kienet ta' gost iktar minn kollox.

Interviewer: Nirringrazjak anke mhux tal-lum biss insomma, ta' kemm meta tkellimna u tal-lezzjonjiet anke li rajt matul dan il-perjodu, grazzi ħafna.

Participant: Grazzi lilek ukoll tal-opportunità għaliex naturalment meta tiltaqa' ma' opportunitajiet ġodda titgħallem u tirrealizza kemm tista' tkun iktar varjat f'dak li titgħallem u r-riżorsi li tista' tikkreja bihom il-lezzjonijiet.

Interviewer: Grazzi.

Unstructured interview with Ms Roberta, Translated

Interviewer: Thank you …. and I also thank you for the past weeks where you welcomed me into your classroom, this has been going on since February, I have seen the students, I have seen the way you teach and for me it was an experience. Irrespective of this research I have learnt a lot because I have also seen other things too in your classroom. As you know, the focus of this is on the tablets, I know from this experiment that you tried, you took the opportunity to expand your teaching methods too. I'm saying this because obviously the tablets are something new and we do not have a research on this however you have seen their possibilities. We are in this room where we use the tablets and so on but you started the first part of your lesson in your classroom.

Participant: Most of the times the lesson starts in the classroom so that the students can have an idea on what the lesson is going to be about, its goal and what subject and then we would use the tablet so that we incorporate it with the lesson. The planning would include hands on activities and also digital tools so that the students can explore different learning methods both at home and at school so to say.

Interviewer: So by using the tablet you are also teaching the students how to use the tablets at home somehow, they have an idea of software available etc.

Participant: In fact the idea was that the tablet can be carried anywhere, the tablet is not there to use it as a means of play only but it can be used to learn so at school we are showing them various apps and different programmes from which they can learn and maybe while at home playing with the tablet they can also learn from it and not just play.

Interviewer: In fact I have also noticed that most of the times they used really great apps, ready made apps that have a lot of sounds etc, etc and there is a lot of testing kind of, self learning meaning that the children are not just listening but self learning, autonomous learning where the students are learning on their own. What do you think about this? Do you see this as an advantage?

Participant: Naturally the applications are not there randomly, I would spend a lot of time researching, you find a lot of applications but then you choose one so they are not there by chance. All the things that the students did, the games that we did I used a lot of time because I play them myself to check them out also to see what happens should a student get an incorrect answer. There were applications that were not only self-learning meaning that the application tells you what's right and what's wrong but there were also applications that gave you a summary of what the children did, what they got right and wrong so as a teacher I would be able to have an assessment sheet of the children and of what they did.

Interviewer: Maybe I'm going to ask you a difficult question, there are also open ended applications, the quality of these are not as good as other apps and their end goal is completely different. Do you see this as a difficulty, to be clear, time? To prepare for the resource sometime the quality is not as good? How do you see this because on the other hand these kind of apps would give you the opportunity to reach your goal, what you had in mind because the ready-made apps also require a lot of research as you mentioned.

Participant: Naturally, the fact that you have the tablet as an extra resource it requires time, you need to research more, you need to try more, you cannot just choose an application which

you think it's good and put it there without testing it first, you need to see its pros and cons. If you have an application where you need to input your own questions naturally you need to do more research, you need to create it so it takes more time, it takes more time to learn how to use it so there's a lot to do and the time we have is what it is so planning takes a lot of time and there are a lot of things you need to do from your end beforehand. This is not like having a copybook and maybe an idea comes to mind at that time, with an application you need to prepare ahead however when you see the children enjoying themselves you try to balance the two of them. The fact that we had a student that did not follow the English language and she did only Maltese created a bit of an issue because most of the time the applications in Maltese were not ready available, I couldn't find any which you could just use but you had to create them. When you have to create these and use the Maltese fonts not all the applications gave you this option so the limitations increased however you still try to see what's best and try to work on those not just look at the negative side of it so you try to find a balance. Naturally there were challenges however when you see the project in a holistic way, the fact that the class was quite a small group not like other classes that I used to teach, it made a difference too. The fact that it was a small group it helped because the students had more attention and each one could work at their own pace, I think that the best thing in this self-learning is that everyone had a self-development at one's own pace so to say so I think everyone had his own personal challenges and there was no need to compare one to another or compete with each other. The fact that there were enough devices for each student, each one could work at their own pace. When we tried to work as a team naturally the students had different challenges to work in a team, in this case there wasn't the need because each one had their own device and I think this helped the students because for them it was play, their were learning without knowing to a certain point and the fact that the tablet or IT in general is self-correcting not like the teacher that needs to tell you to stop or erase or correct, the students were learning more because they were realising on their own that they cannot do it incorrectly. In order to move forward you need to give the correct answer so they were giving their best to give the correct answers and I think that helped them a lot.

Interviewer: In fact you have mentioned a lot of advantages, you also mentioned some disadvantages obviously like the fact of using the Maltese language which although it has a number of limitations and these off the shelf apps are not provided in Maltese; another advantage is that apart from touching the tablet they can also listen and there was also a lesson on writing skills for example, they needed to spell and write the word as if writing it on —it simulates almost as if writing it on another material like sand etc although maybe not as effective. I did also noticed that in the classroom you used magnetic boards for example and there was the felt calendar, how do you compare these non-digital tools with the digital ones? What advantages do these have over the tablets?

Participant: The fact that this is a Year 1 class of children between five and six years, for them them the sense of touch is very important so in my opinion I think it was important that they see and feel different materials and textures. There were moments where we used used the magnetic boards, other moments where we used plastic letters so they can feel different materials however the idea of the lesson was to incorporate all these together. It's not just the tablet or just the hands on but we joined them all together in order to make them realise that you can learn about one thing in many different ways. I believe that the fact that children these days live in a digital world it would have been a deficiency if we didn't give them the opportunity to use ICT tools not just the tablet because a lot of lessons in class are done using the Interactive Board so I think that the fact that we give them a bit of everything we give them a vast experience on what they can see. In the future you cannot say what job they are going

to go for so it's a benefit that we exposed them to different tools and they had the chance to try them in different ways. The fact that there were also two particular students that required special help because they needed a more personal help from an LSE for example, I think we gave them the opportunity to develop their strengths so I think we catered for various strengths, we did not stop the children from learning and whoever improved we gave them the opportunity to improve further so the fact that we changed between tangible objects and other screen related objects we gave them the chance and opportunity to see both and I think that both were very effective in reality as they were incorporated together.

Interviewer: The fact that, as you mentioned, it is a small class that you have this year however you still had 2 challenges meaning that you had a student with special needs in regards to hearing, the fact that they come here in this setting and so it changes to a setting not so formal do you see this as a challenge or it was an opportunity that they could use something else?

Participant: The children enjoyed the fact that they changed setting so they used to look forward to it, they were enthusiastic about it. I believe that the learning doesn't have to be confined to just the classroom, the fact that we moved out of the classroom and gave them a different environment, an informal one where they sit on a cushion and be more comfortable the teaching became more enjoyable rather than compulsorily and so the fact that the application made them learn compulsorily they were still playing and by means of play they were learning without realising it and so I believe that this is something like a life skill because in life most of the time you learn because you need to and I think that in this case, the fact that the application did not let you move forward unless you give the correct answer, they were realising the need to learn and remember things in order to move forward and I think that the surroundings helped them a lot too because for them it was an enjoyable experience. They looked forward to it and they asked for it from lesson to lesson and I think that they even liked that the lesson was split, for them it was an enjoyable experience more than anything.

Interviewer: I thank you not just for today but for all the times we talked and the lessons that I shadowed during this period, thanks a lot.

Participant: I thank you too for the opportunity because naturally when you encounter new opportunities you learn and realise that you can vary your teaching from what you learned and the lessons you can create with the resources.

Interviewer: Thank you.

Unstructured Interview with Ms Yosanne
24th June 2016

Interviewer: Grazzi .... li għażilt li tgħini anke f'din l-analiżi tiegħi wara li rajna anke t-tfal għamlu l-analiżi u urewna ukoll x'għoġobhom u m'għoġobhomx forsi tgħini daqsxejn ukoll f'din l-analiżi bejnietna tat-tablets, ta' dan il-proċess minn dak li rajna u minn dak li rajt matul dawn il-ġimgħat. Innutajt li ħafna drabi inti kont tibda l-lezzjoni fil-klassi umbagħad wara kont tkompli t-tieni parti bit-tablet, dan qisu meta nara l-ġimgħat kollha, kien kważi dan qisu l-pattern normali ta' li għamilt. Meta ppjanajt dawn il-lezzjonijiet inti kont tipprova ssib xi ħaġa li forsi bit-tablet jistgħu jgħinuk iktar minn għodda oħrajn?
Participant: Le bażikament bit-tablet kont nagħmel ħafna activities, logħob biex huma jiftakru, dejjem ngħinhom jaraw x'tgħallmu u x'ma tgħallmux u apparti minn hekk kont noħroġhom mil-klassi ħalli huma ma jibqgħux f'ambjent ta' mejda u siġġu imma jagħmlu xi ħaġa oħra. Huma liberi jimxu, jaraw, jitgħallmu mil-camera, jieħdu ritratti u ħafna affarijiet minn dawn.
Interviewer: Xi ħaġa li innutajt li ukoll użajt ħafna open ended apps eżempju l-quizlet, ovvjament fit-tablet hemm ukoll dawk li ngħidulhom close ended apps jiġifieri jkunu lesti. X'inhi r-raġuni jiġifieri fil-close ended apps ma sibtx dak li tixtieq? Jew qisek qed tipprova taħseb li dak l-istil ta' tagħlim huwa iktar li qisek tixtieq tersaq lejh li hemm iktar forsi kreattività jien naf, eċċetra, eċċetra, minn għandek jew minn għand it-tfal?
Participant: Le, bihom inkun nista' nilħaq il-livelli tat-tfal u mhux xi ħaġa lesta li jistgħu jagħmlu d-dar imma xi ħaġa li nista' ngħinhom u jitgħallmu affarijiet oltre minnhom. Mhux titgħallem xi ħaġa waħda u waqaft s'hemm, tista' titgħallem ħafna affarijiet differenti.
Interviewer: Fhimtek, meta tkun speċjalment il-parti fil-klassi però ġieli anke saret anke fejn kien hemm it-tablets kont temfasizza ħafna l-pronunzja jiġifieri l-ħoss taċ-'ċ' u tax-'x' il-ħin kollhu anke t-tfal ikantaw tal-ħsejjes tal-letter names, 'a' for apple eċċetra. Ovvjament bl-iPad ma jsirx dak il-mod jiġifieri dak qisu mod ejja ngħidu tradizzjonali fis-sens non digital iktar milli tradizzjonali għax huwa mod interattiv ukoll imma huwa non digital allura ovvjament mhux tradizzjonali jiġifieri huwa non digital. Tarah bħala żvantaġġ fil-każ tal-iPad li meta tgħallem bl-iPad li m'hemmx hekk?
Participant: Bl-iPad tkun limitata iżjed tipo minn diski u affarijiet hekk it-tfal jitgħallmu iżjed u jiftakru u anke li persuna qegħda tkellimhom differenti milli qegħdin mal-iscreen, m'hemmx dik ir-rutina qisu ta' kuljum.
Interviewer: Il-kant tista' taqbdu pattern per eżempju.
Participant: Eżatt biex huma dejjem jiftakru li qegħdin nagħmlu, li għamilna l-ġurnata ta' qabel u għalfejn, qed tagħmel revision b'mod ta' malajr.
Interviewer: Hekk hu, xi ħaġa oħra mhux diġitali li taħdem perfett eżempju hemm għodod oħra bħal per eżempju l-użu tar-ramel, it-tfal qed ipinġu, huma kollha logħob interattivi dawn, m'humiex ovvjament diġitali però huma mod fejn it-tfal qed imissu, qed imissu r-ramel, qed jaqbdu t-tpinġija. Tara l-istess effett fuq l-iPad meta jpinġu fuq l-iPad u dik ta' tanġibilita?
Participant: Jien naraha differenti tipo anke ma jitgħallmux kif iżommu lapes, mhux qed imissu b'idejhom jiġifieri tista' tagħmilha imma fil-fehma tiegħi jekk issir ta' spiss qed tagħmillhom il-ħsara għax l-affarijiet tanġibbli jridu jkunu hemm, bħala tablet, bħala iPad.
Interviewer: Tara xi mod meta tpinġija għandha tkun fuq l-iPad jew qisu idealment le ħa npoġġiha hekk?
Participant: Tista' tagħmilha imma mbasta ma tagħmiliex ta' kuljum, tipo jekk qed titkellem fuq il-kuluri jistgħu jien naf colour recognition oranġjo liema hu, ittihom l-instructions u jimlew hekk nagħmilha imma mhux ta' kuljum, mhux ħa tieħu l-post tal-lapes, tal-kuluri biex niftehmu.

Interviewer: Ftit ilu kont għedtli li kont magħfusa b'check list u ovvjament jiena, għax hekk etikament mitlub minni m'għamilniex dik il-lezzjoni għedna ħa nħalluha, ovvjament mhux se nsaqsik għaliex ma saritx il-lezzjoni però l-mistoqsija hija, id-domanda hija jekk l-iPad, it-tablets, irnexxielhomx jilħqu dawk il-miri tal-litteriżmu, ovvjament iċ-checklist hija tal-litteriżmu b'hekk qed nirreferi din il-mistoqsija. Taħseb tista' tara improvement fl-andament tal-litteriżmu meta jużaw l-iPad rigward dik iċ-checklist għax ovvjament nifhem jiena li anke bħala support teacher e-learning nista' nifhem li hemm ħafna literacies differenti li t-tfal jistgħu jilħqu imma għal fini li t-tfal per eżempju jitgħallmu skond dik iċ-checklist jew il-kitba per eżempju, jew jaqraw jew hekk, ħa jifhmu? Ħa jkun hemm improvement jekk jużaw l-iPads?
Participant: Jiena naħseb tgħinhom jekk tagħmilha ta' spiss tipo qari mit-tablet, mil-iPad insomma, letter recognition, tgħinhom ħafna għax it-tfal jinteressaw ruħhom u jagħmluhom waħedhom. M'għandhomx bżonn qisha l-għalliema tiġri warajhom 'Isa għamilhom, għamilhom, għamilhom' bħal kitba, jaqbdu jagħmluha u huma qegħdin jitgħallmu mill-apps differenti li konna nużaw.
Interviewer: Hawn hekk konna limitati mal-kamra, hija l-kamra ovvjament fil-kamra ukoll hawn il-wifi, hemm l-access point, tara xi vantaġġi tal-iPad jew tat-tablet li tista' toħroġ barra mil-klassi kieku eżempju f'xi outing u hekk?
Participant: Naħseb tista' tagħmel ħafna affarijiet bihom tipo tieħu ritratti, l-ewwel ħoss, l-aħħar ħoss, sillabi, huma jiktbu jieħdu nota fuq l-iPad u t-tablet; ovvjament imma umbagħad għandek riskju ħux jinkiser x'nagħmlu? Jiġifieri hemm xafra taqta' minn żewġ naħat speċjalment mat-tfal ta' Year 1.
Interviewer: Nirringrazzjak ħafna u grazzi li anke matul dawn il-ġimgħat osservajt anke l-klassi li tista' tgħini fir-riċerka tiegħi, grazzi ħafna.