Fostering creativity through the use of digital tablets (an investigation into the potential of tablet use for creative production among seven- to ten-year-old children in Malta)

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FOSTERING CREATIVITY THROUGH THE USE OF DIGITAL TABLETS (AN INVESTIGATION INTO THE POTENTIAL OF TABLET USE FOR CREATIVE PRODUCTION AMONG SEVEN- TO TEN-YEAR-OLD CHILDREN IN MALTA)

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ABSTRACT

Many digital media tools are at children's disposal today, providing more opportunities for learning and self-expression than ever before. Such opportunities bring new challenges as these tools enter primary schools. A key aim of this thesis is to argue that constructionist, sociocultural and critical pedagogical theories can support the development of a method that can engage children in creative production with digital tablets as a form of self-organised and interdisciplinary learning in the classroom.

Qualitative and quantitative methods are used to map the current use of digital devices among seven- to ten-year-old children in Malta from the perspectives of children, parents and teachers. A research method of a three-day workshop aims to engage seven- to ten-year-old children in a project-based exercise. The participants are asked to use digital tablet applications to make story narratives and audio-visual content as a means to engage in self-organised and interdisciplinary learning by making concrete projects.

This research demonstrates these children's current limited use of digital tablets for creative production. The workshops reveal children's ability and enthusiasm to self-organise in creative production using various digital applications as means to self-expression and creative thought.

The implications of this study relate to the national policy to roll out tablets in the primary schools in Malta. This thesis argues that mainstream primary schools in Malta impose a rather limited use of digital tablets leaving no room for seven- to ten-year-old children to creatively express through such tools. While more workshops must be carried out and for longer period than three days, this thesis draws the conclusion that the Maltese educational policy of one-tablet-per-child in primary schools must include children's interpretations of creativity with such devices and make room for creative expression, as creativity is integral to individuals' identity, wellbeing and learning.

Table of Contents

ABSTRACT **2**

LIST OF TABLES AND IMAGES **6**

ACKNOWLEDGEMENTS **7**

DECLARATION **8**

CHAPTER 1 ..... **9**

CREATIVITY, DIGITAL MEDIA AND CHILDREN: THESIS OVERVIEW **9**

1.1. INTRODUCTION 9

1.2. ISSUES ADDRESSED IN THIS THESIS 11

1.3. WHY FOSTER CREATIVE PRODUCTION WITH DIGITAL TABLETS? 15

1.4. RESEARCH QUESTIONS INVESTIGATED IN THIS THESIS 17

1.4.1. QUESTIONS ADDRESSING CREATIVITY THROUGH DIGITAL DEVICES: *17*

1.4.2. QUESTIONS ADDRESSING CHILDREN: *18*

1.4.3. QUESTIONS ADDRESSING PARENTS: *18*

1.4.4. QUESTIONS ADDRESSING TEACHERS: *19*

1.5. DIGITAL MEDIA DEVICES CONSIDERED FOR THIS THESIS 21

1.6. MALTA AS A CASE STUDY 24

CHAPTER 2 ..... **27**

LITERATURE REVIEW **27**

2.1. INTRODUCTION 27

2.2. REVIEW OF LITERATURE ON CREATIVITY 30

2.3. DEVELOPMENTAL APPROACHES TO CREATIVITY AND LEARNING 39

2.4. THE IMPORTANCE OF SELF-MOTIVATION TO CREATIVITY 50

2.5. THE ROLE OF CHILDREN'S SOCIO-ECONOMIC BACKGROUND ON THEIR LEARNING AND CREATIVITY THROUGH THE USE OF DIGITAL MEDIA 55

2.6. THE ROLE OF PLAY WITHIN THE SUBJECT OF CREATIVITY 57

2.7. CREATIVITY AND DIGITAL DEVICES IN THE CLASSROOM 62

2.8. CREATIVITY AND DIGITAL MEDIA DEVICES 67

2.9. REVIEW OF CRITICISMS RELATED TO DIGITAL MEDIA USE ON CHILDREN'S CREATIVITY 74

2.10. CREATIVITY AND MEDIA LITERACY 86

2.11. REVIEW OF SOME THEORETICAL MODELS OF CREATIVITY 93

2.12. ISSUES IDENTIFIED FROM THE LITERATURE REVIEW 97

2.13. CONCLUSION 103

CHAPTER 3 ..... **110**

THEORETICAL FRAMEWORK AND METHODOLOGY **110**

3.1. INTRODUCTION 110

3.2. THEORETICAL FRAMEWORK 111

3.3. RESEARCH SAMPLE 118

3.4. TWO-STAGE SELECTION OF SAMPLE 121

3.5. SAMPLE SELECTION OF PARENTS, PRINCIPALS AND EDUCATORS 122

3.6. RESEARCH METHOD 124

3.6.1. RESEARCH INSTRUMENTS FOR PHASES 1 AND 2 124

3.6.2. PARENTS' PERSPECTIVE TO CHILDREN'S DIGITAL MEDIA USE 127

3.6.3. CHILDREN'S PERSPECTIVE TO DIGITAL MEDIA USE 129

3.7. ANALYSIS OF QUALITATIVE DATA 133

3.8. RESEARCH INSTRUMENT FOR PHASE 3 135

3.9. WORKSHOP PARAMETERS 140

3.10. WORKSHOP OBJECTIVES 142

3.11. ETHICAL IMPLICATIONS 144

3.12. CONCLUSION 148

CHAPTER 4 ..... **151**

OVERVIEW OF RESEARCH FINDINGS **151**

4.1. INTRODUCTION 151

4.2. OVERVIEW OF RESEARCH PHASES 1, 2 AND 3 153

4.3. PROFILE OF SURVEYED PARENTS 156

4.4. PROFILE OF THE PERSONALLY INTERVIEWED PARENTS 158

4.5. PROFILE OF THE INTERVIEWED CHILDREN 159

4.6. CONCLUSION 161

CHAPTER 5 ..... **163**

FINDINGS OF RESEARCH PHASES 1 AND 2 ..... **163**

5.1. INTRODUCTION 163

5.2. THE PARENTS' PERSPECTIVE: OWNERSHIP AND USE 166

5.3. PARENTS' PERSPECTIVE: REGULAR USE 170

5.4. THE PARENTS' PERSPECTIVE: UNCOMMON AND SPORADIC USE 174

5.5. THE PARENTS' PERSPECTIVES: PURPOSE OF USE 180

5.6. THE PARENTS' PERSPECTIVE ON 'CREATIVE' USE 183

5.7. THE CHILDREN'S PERSPECTIVE: CREATIVE PRODUCTION AND USE 196

5.8. CONCLUSION 220

CHAPTER 6 226

DISCUSSION OF RESEARCH FINDINGS FROM PHASES 1 AND 2 226

6.1. INTRODUCTION 226

6.2. TOOLS OR REWARDS 227

6.3. SELF-NAVIGATED CREATIVITY 231

6.4. THE OVERSCHEDULED CHILD 238

6.5. FINANCIALLY RICH OR QUALITY TIME RICH? 241

CHAPTER 7 250

FINDINGS OF RESEARCH PHASE 3 250

7.1. RATIONALE 250

7.2. QUESTIONS RELATED TO THE RESEARCH PHASE 3 260

7.3. WORKSHOPS STRUCTURE 261

CHAPTER 8 274

DISCUSSION OF RESEARCH FINDINGS FROM PHASE 3 274

8.1. INTRODUCTION 274

8.2. PROJECT INITIATION 282

8.3. DEVELOPMENT OF PROJECT DETAILS AND DESIRE TO EXPERIMENT 285

8.4. GREGARIOUSNESS AND POSITIVE EMOTIONS 293

8.5. Q & AS, BRAINSTORMING AND DISCUSSIONS 296

8.6. INCREASED CONFIDENCE AND PROJECTIONS 313

8.7. SLUMP IN ENTHUSIASM, NEGATIVE EMOTIONS AND DISTRACTEDNESS 316

8.8. CONCLUSION 320

CHAPTER 9 328

CONCLUSION 328

9.1. INTRODUCTION 328

9.2. PLACE OF THIS RESEARCH WITHIN THE LITERATURE 336

9.3. LIMITATIONS AND OPPORTUNITIES FOR FURTHER RESEARCH 341

APPENDICES 345

APPENDIX A – APPLICATION FORMS TO CONDUCT RESEARCH IN MALTESE SCHOOLS 345

APPENDIX B – CONSENT FORMS 348

APPENDIX C – QUESTIONNAIRE FOR PARENTS 350

APPENDIX D – SOME OF THE APPS SHOWN TO AND DISCUSSED WITH CHILDREN AND PARENTS 354

APPENDIX E – MONITORING SHEET *355*

BIBLIOGRAPHY **356**

LIST OF TABLES AND IMAGES

TABLE 4.1 SUMMARY OF RESEARCH PHASES, INSTRUMENTS AND OBJECTIVES 155

TABLE 4.2 PROFILE OF PARENTS WHO WERE PERSONALLY INTERVIEWED.....159

TABLE 4.3 SUMMARY OF INTERVIEWED CHILDREN ACCORDING TO AGE, GENDER AND SCHOOL.....160

TABLE 7.1 SUMMARY OF WORKSHOP PARTICIPANTS ACCORDING TO AGE, GENDER AND SCHOOL TYPE 263

TABLE 7.2 OVERVIEW OF THE SOFTWARE APPLICATIONS THAT WERE DEMONSTRATED TO THE WORKSHOP PARTICIPANTS.....272

TABLE 8.1 BEHAVIOUR AND ATTITUDE INDICATORS THROUGHOUT THE WORKSHOPS.....279

TABLE 8.2 SUMMARY OF WORKSHOP PROJECTS AND TOTAL ELAPSED TIME CHILDREN SPENT ON THEIR WORK.....284

SET OF IMAGES 8.1.....288-289

SET OF IMAGES 8.2.....300-302

SET OF IMAGES 8.3.....304

SET OF IMAGES 8.4.....308

SET OF IMAGES 8.5.....310

SET OF IMAGES 8.6.....311

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DECLARATION

I declare that all the material contained in this thesis is my own work.

CHAPTER 1

CREATIVITY, DIGITAL MEDIA AND CHILDREN: THESIS OVERVIEW

1.1. INTRODUCTION

This thesis explores the ways children use digital tablets for creative expression such as for the making of projects, products, or ideas as part of their interaction with and learning to use such devices in and outside school. The aim is to further draw from children's existing practices and studies with similar aims to foster creativity with digital tools, in order to develop a more permanent model that can encourage creative production which can subsequently be used in the classroom, where such tools, as it will be later revealed, are used in a rather limited way. The thesis stems from three main research domains: constructionist, sociocultural and critical pedagogical perspectives within educational research.

Investigating the purpose of children's use of tablets for creating novel concepts and ideas can provide a concrete occasion to outline the theoretical and practical issues within the field of education. As a result, this thesis argues that these three theoretical domains can be integrated into a model that can enable creative production with such devices in school where such use remains largely incoherent, limited and teacher-led.

While much international debate covers the subject of use of digital media devices, social media and the Internet in general by children and young people, little discussion surrounds the needs, interests and purpose of using such devices for creative production and specifically from the children's own perspectives of what constitutes creative production with such devices. While research on the affordances as well as the threats and the risks related to the use of digital and online media is growing, little is said about seven- to ten-year-old children's creative development from their own perspectives beyond the subject of interaction with digital devices. There is no available research in Malta with regards to methods or models for using digital devices for the purpose of fostering creative production when children engage with these in school. There is no literature that discusses or demonstrates evidence about any form or process of creative production by children through digital devices or evidence with regards to children's personal motivations related to making things with such devices. Lastly, there is no empirical data on creative production with digital devices in or out of school within the Maltese context.

Consequently, growing concerns and interest are shown from representatives of the fields of education and academia with regards to the purpose and the type of use of

digital devices will be put into once they enter primary education as a result of a national policy of one-tablet-per-child that has aimed to equip seven- to ten-year-old children with digital tablets as from 2016 (Digital Malta, 2016). While some arguments surround the question of how such digital tools would contribute to learning or pedagogy, this thesis aims to identify how these devices could contribute to creativity – and from there learning – by paying attention to the child's perspective, voice and experience in the debates about creative production with digital devices.

1.2. ISSUES ADDRESSED IN THIS THESIS

The first issue relates to the interpretation of creativity and creative production with digital devices from the child's viewpoint. This issue further advances to how children's views, interests and motivations are reflected in the mainstream curriculum with regards to the ways and purposes with which such tools were used in class. With varying degrees of application, schools and educators have attempted to adopt interventions or models to foster creativity (Willett, Robinson and Marsh, 2011; Ott and Pozzi, 2010; Ejsing-Duun and Skovbjerg, 2016). Research has acknowledged the importance of teaching children critical thinking about popular media (Singer and Singer, 1998), taking children's own interests such as popular culture as the means to motivate them in the classroom and introducing such popular cultural material to support their critical literacy (Marsh, 2004, 2006). Research has

shown how through engaging children in creative production of media they can demonstrate awareness and knowledge of various issues (Gauntlett, 1997, 2007).

On the one hand, learning does not necessarily begin and end with the classroom (Sefton-Green, 2010). A school's curriculum, disciplinary norms and parameters of what should constitute and be recognised as learning or educational are socially and culturally predetermined. As social and cultural changes have shifted towards the so-called 'second modernity' (Beck and Grande, 2010), more debates about what should constitute learning and education and what school should provide and how arise as a result. The debates now encompass the need to encourage self-control and individualised learning – of "re-contextualisation of learning itself, which is generated by the transition to an increasingly globalised second modernity" (Chisholm, 2008, p. 139). Emancipating society by encouraging "self-direction, engagement, variety and transferability in the shaping of 'learning life-courses'" (Chisholm, 2008, p. 140) results in questioning the power of school as the "sole route to success, since in addition to formal qualifications, young people must now demonstrate a capacity and willingness to engage in diverse forms of learning throughout their lives" (Livingstone and Sefton-Green, 2016, p. 31). And while such shifts towards individualism carry with them new opportunities for self-direction and emancipation but also risks of further social division, the focus should be, at least for this thesis, on the child – the learner – and the details surrounding their interests, experiences and understanding of what is imparted as learning material. Moreover, from a critical viewpoint this is to say that children must be challenged to understand that knowledge about subjects cannot be "reduced to the objects themselves…we need to challenge them to treat critically the ""clothesline of information" with

which they are working" (Macedo and Freire, 1987, p. 131). This means that, while this thesis looks at what creativity and creative production with digital media devices means to children, how they channel their thinking while using such tools and why they do so in the first place, it is also imperative to challenge the children, by encouraging them to treat critically the "clothesline" (Macedo and Freire, 1987, p. 131) of content and equally the software applications which they use.

The second issue relates to learning, specifically, how creativity and learning interlink; whether technology serves the purpose to reproduce existing social formations; or whether it empowers its users to become critical thinkers and makers of change. From such a standpoint, therefore, this thesis uses the child-centred approach to understand what happens when digital devices are used in the classroom and outside it; how they are currently used in the classroom – and how such use reflects the children's personal interests, motivations and experiences. The preliminary analysis of what happens in the classroom when children use digital tablets is done with some degree of reservation and supposition that such use would be rather limited to practicing basic numeracy and literacy. Therefore, the goal of this thesis is to use a different method that would aim to determine whether, if the manner in which children are allowed or encouraged to use these devices changes, they would engage in self-organised, creative production that would involve interdisciplinary, deep and self-directed learning.

The third issue relates to the differing viewpoints on creativity and creative production with digital media devices. Parents and teachers who form part of the social and cultural milieu in which children live and learn have their own views and

understanding of use, which must be examined and juxtaposed with those of the children examined for this thesis. The juxtaposition is made with the effort to highlight that differences may exist between what children, parents and teachers consider creative and what role each member of this milieu sees creative production to have in a child's life. While parents and teachers may disqualify a picture taken with a mobile phone as creative – or even as a form of learning – it is worth to understand how children interpret their creation, such as a picture taking with a mobile phone, what such creation means to a child, what such meanings may reveal for the way that child makes sense of the surrounding world, and also what that child's personal interests and motivations are behind making things such as taking a picture. Consequently, creative production in the context of this thesis is seen as an everyday experience and as a way of self-expression – whether it is through drawing, writing, building on Minecraft or designing collages – a way in which "we can make communications about our consciousness and our sense of being in the world" (Gauntlett, 2007, p. 15), and, thus, as a process of self-discovery and learning (Piaget, 1973).

Therefore, this thesis looks at the conceptual ideas and creative production for which children use digital media devices from the child's perspectives and experiences; what creative production with digital media devices means to them in general and, in contrast, how parents and educators understand such concepts; currently, what seven- to ten-year-olds use such devices for, in and outside of the classroom in Malta; whether their current practices enable creative production as the children understand it.

Finally, in view of the current realities surrounding the question of whether children, aged seven to ten in Malta, use digital media devices for creative purposes, a model is proposed to put such use for the wider benefit to foster creative production with tablets, which can serve as a benchmark or a starting point to the mainstream primary school curriculum where such devices are used regularly (Ministry for Education and Employment, 2014).

1.3. WHY FOSTER CREATIVE PRODUCTION WITH DIGITAL TABLETS?

The purpose of this thesis, which is to foster creative production with digital tablets in or outside of the classroom, stems from two beliefs. First, creativity is seen as an everyday need for self-expression and communication (Gauntlett, 2007). Creativity is a "necessary celebration of existence" (Nietzsche, [1872], 1967, in Gauntlett, 2007, p. 26). Secondly, creativity, expressed by making things is also a process of self-organised, self-directed and self-motivated interdisciplinary learning (Mitra, 2003; Mitra and Rana, 2001). Therefore a link is made between creativity with learning by making (Resnick, 2014, 2017; Papert, 1993). That is, while children engage in experimenting and exploring when they make things that they are interested in, care about, or think of, they also learn.

The theories that have been chosen to frame the current thesis help to look at children as individuals who have, who can and who should be allowed to express their own perspectives and interests as part of a creative process (Kaufman and

Sternberg, 2010) when they engage with digital media devices. Children's perspectives should further include a critical view of the tools they engage with and not a mere effort at mechanically acquiring the skills to interact with them. Therefore, fostering creativity through digital media devices should begin with encouraging children to enquire and identify their personal motivations and channel those to express creative thought.

Fostering creativity and creative production with digital media devices is of interest here for three reasons. First, as children engage daily with digital devices such as networked tablets and learn to navigate relatively quickly, questions remain as to the extent to which they make use of these tools' fuller potentials both in and outside of school; the creative production children engage in as they understand it; and the nature of use of such devices – whether it is to support creative production, individual motivation to learning or to support specific subjects and lessons from the curriculum.

Second, this thesis argues that regardless of the tools presented to children, it is the needs, interests and perspectives they have or develop that can foster creative production.

Third, in conjunction with the three theoretical domains – the constructionist, the sociocultural and the critical pedagogical – children may use digital media devices for creative making, which can have larger implications for how such devices will be used in class. While this thesis centres its research questions on the children – by hearing out what they have to say on the subject of creative production with digital

media devices – it does not disqualify the importance of guidance and instruction that may be necessary to the learning process (Reid et al., 1993; Mayer, 2004; Kirschner, Sweller and Clark, 2006).

1.4. RESEARCH QUESTIONS INVESTIGATED IN THIS THESIS

Fostering creativity through the use of digital media devices as the main objective of this thesis, as a research question and as an objective to pursue methods to fulfil creative production, therefore, addresses the following main questions:

1.4.1. QUESTIONS ADDRESSING CREATIVITY THROUGH DIGITAL DEVICES:

Q1 Would a combination of the constructionist approach (Papert, 1993) with instructional framing (respecting critical and sociocultural theories) enable creativity – expressed through creative production – as children engage with digital devices?

Q2 What behavioural and attitudinal indicators and processes could be identified when children engage in creative production with digital devices within the framework of Q1?

Q3 Can an applicable framework be designed for creative production through the use of digital devices with the aim to establish a culture of creators and makers and not only consumers of digital media?

Prior to the above main research questions several others were asked with the aim to outline the context in which the examined children engaged with digital devices at the time that the research for this thesis was conducted. These questions are grouped into four:

1.4.2. QUESTIONS ADDRESSING CHILDREN:

(1) What is creativity in children's opinions and understanding?

(2) What do children understand by creative production with digital devices and what things do they make?

(3) In relation to question (2), what are children's favourite activities on their digital devices and which of these can they categorize as ones that make them feel creative, like they are making something novel and exciting?

(4) How does their use of digital devices compare to how these are being used in schools and how do children view the use in school compared to their own personal practices?

(5) What is being discussed in the family with regards to making and creating things with digital media devices?

1.4.3. QUESTIONS ADDRESSING PARENTS:

(6) What are the children's breadth and depth of use of digital devices from the parents' perspective?

(7) What is the parents' overall attitude towards their children's use of digital devices in relation to what they consider creative production?

(8) What do parents understand by creative production and creativity in general?

(9) How and what are the parents' methods of fostering their children's creativity through digital media devices?

1.4.4. QUESTIONS ADDRESSING TEACHERS:

(10) With regards to the use of digital devices in school, where that already takes place in the Maltese primary schools, what are the teachers' overall perspectives on such use?

(11) How are digital devices incorporated into the information and communication technologies (ICT) lessons (where this has already taken place)?

(12) How do teachers foster creative production when children engage with digital devices (if they do)?

Both quantitative and qualitative methods were used to 'map' the current breadth and depth of use of digital media devices among the interviewed seven- to ten-year-old children.

A creative method (Gauntlett, 1997, 2005, 2007) was used to conduct seven case studies in the form of workshops that aimed to foster creative production with tablets among seven- to ten-year-old children from various socio-economic backgrounds across Malta. A similar creative method was used to capture children's awareness of environmental issues where the participants demonstrated their knowledge by making personal videos on the subject rather than respond to pre-set survey

questions or interviews (Gauntlett, 1997, 2005). Similarly in this thesis the method, used to capture children's creativeness in order to understand how they can self-organise into making something meaningful and the learning that takes places as a result, aimed to give participants the freedom "to communicate their own experiences or engage in a meaningful way" (Gauntlett, 2007, p. 93). Through the use of such a 'hands-on' method, the workshops aimed to address the main research questions, Q1, Q2 and Q3, of this thesis. Each of the above three groups of questions, (1) to (12), present issues that can be addressed individually and as separate research studies. Nevertheless, they variously address the main research questions, and the main objective of this thesis to develop a model that can enable creative production through digital media devices.

This thesis begins by identifying the digital media devices considered in this research and presenting Malta as a case study in relation to the country's national policy to enrol all primary school students with digital tablets (Department of eLearning, 2015). It continues with reviewing the literature and the theories relating to the main arguments of the current research. The subsequent chapter presents the subjects, the children, who took part in the research, followed by description of the methods of research used to map the current digital media practices among the investigated children and the method used to engage them in creative production. The ethical implications in relation to doing research with seven- to ten-year-old children are outlined. Presentation of the research findings and conclusions follows.

1.5. DIGITAL MEDIA DEVICES CONSIDERED FOR THIS THESIS

A clear definition must be made of the type of technologies that are used by seven- to ten-year-old children, the age group examined in this thesis. As Douglas Clements and Julie Sarama write: “Similar to different uses of paper, different uses of computers must be considered separately” (Clements and Sarama, 2003, p. 7). Therefore, to discuss digital technologies as one common entity is too generic, if not inadequate.

To define digital devices for the purpose of this thesis three clarifications are necessary to be made. The first one relates directly to the nature of the hardware and software of the devices. Digital devices contain a computer or a microcontroller. Today, there are all kinds of digital, portable technologies, such as the digital tablet, smartphones and smartwatches. They provide access to the Internet, therefore to content of any nature and source. They enable connection with others across the globe. More than that, digital devices provide a versatile number of software applications, apps, which serve various purposes to the user – from executing simple calculations, to providing entertainment, such as video games, consumption of programs, music and film, to providing tools for creation of personal content – audio-visual, written, virtual – to offering game-like interactive activities for practicing reading, writing, and mathematical skills, experimentation, socializing with others and so on. In this thesis the focus is on the digital tablet, which can provide access to the Internet – for content and audio-visual material – as well as to apps, embedded in the tablets, which allow children to creatively produce audio-

visual or text-based stories, projects, products and narratives, based on their personal interests and ideas.

The second clarification to make with regards to digital devices is their ecological nature (Postman, 1996). Digital devices are used on a daily basis. Technologies form part of daily life (Ito et al., 2009; Mediappro, 2006). Children and young people appropriate technologies to fit their daily lives (Livingstone and Sefton-Green, 2016; Livingstone et al., 2014a). As technologies form part of everyday experiences they bring an ecological change to life. Technologies are not impartial tools that can be added or subtracted to an ecological system without expecting radical change to it (Postman, 1996). This calls to mind Bronfenbrenner's social ecology model of a child's development in respect to his immediate environment, the contextual structures within which individuals and places are located: Microsystems, mesosystems, exosystems and the macrosystems (Bronfenbrenner, 1992). Within a microsystem that is the classroom, the child's classmates and teacher, the mesosystem, or the relationship between the different settings during a child's development, will change with the introduction of digital devices in that microsystem. The interest here therefore is how the digital tablets introduced in the microsystem that is the classroom would change – or not – how children create and learn as they engage in creating with these tools. Moreover, if their microsystem should change, can these ecologically significant tools provide more room for creative expression, personal voice and individual self-organised learning?

The third clarification that must be made relates to the use of digital tablets in the primary schools in Malta. The children examined in this thesis study information and

communication technologies (ICT) lessons at least twice a week in school. At primary school level all children in Malta learn core Microsoft programs as part of their ICT curriculum. Children use, navigate and interact with desktop computers by practicing and learning Excel, PowerPoint and Word. During preliminary investigation at the beginning of the research for this thesis, a third of the examined children, roughly 180, also used digital tablets in the classroom for various lessons such as mathematics, English, Maltese and religion (details follow further in the text). The tablets were also introduced during ICT lessons where the ICT teacher would explain how the devices should be used and for what. The supposition that followed from this was that tablets and computers in general have been used in a rather limited way in the classroom, specifically during ICT lessons. Old pedagogies seem to persevere (Marsh, 2007) in the face of the new literacies and practices that children experience outside the classroom. Therefore, the objective of this research is twofold. First, it aims to understand as well as collect further evidence that such use is in fact rather limited, specifically, that the studied children do not have much opportunities to creatively express themselves and make creative things with digital media tools. And second, it aims to develop and suggest a model that can foster creative production as a proposition that extra room is made during ICT lessons where children could take a more active role in the learning process while they engage in self-directed creative production of things, projects and ideas on various subjects of public or personal concern or interest.

1.6. MALTA AS A CASE STUDY

This thesis looks at the breadth and depth of children's engagement with digital devices in Malta, and how, why and what children make when they engage with such tools in and outside of school. The objective is to also identify the current use of tablets in Maltese primary schools as a result of a national policy to accommodate primary school children with tablets and what opportunities are designed for children to use these devices for creative production.

As of October 2016 (Ministry for Education and Employment, 2014; Digital Malta, 2016), all primary schools in the country have begun the process of using digital tablets in the classrooms of year 4 students (eight and nine-year-old children). The Government of Malta launched the tablet-per-child policy in 2014 which aimed to introduce digital tablets to Year 4 and Year 5 students – 8 to 10 year old children – in order to modernise the curriculum, encourage digital media literacy learning initiatives in the classroom and to support, encourage and improve learning among other objectives (National eLearning Strategy, 2014; Department of eLearning, 2015; Digital Malta, 2016).

At the time research for this thesis began – the academic year of 2014 – the rollout, that is, equipping every Year 4 and Year 5 child with a digital tablet, was not yet launched. A pilot study was carried out in several government primary schools for six months (Ministry of Education, 2014) in order to:

> Evaluate and trial the different approaches the Government has to choose from in light of changing technologies, as well as the fact that the technological tool itself is cutting edge, and therefore still in the early stages of use in the educational sector. The outcome of these pilots will provide a clear picture of what works best in the Maltese context and allow the Ministry to be better prepared for the procurement of tablets for the 'One Tablet per Child' proposal on a national level. (Ministry of Education, 2014, P. 4)

Despite that, three years later, a complete rollout has not taken place as yet, 6,027 tablets in total have been handed to students in government schools (Times of Malta, 2017). The reasons for that vary from operational, technical and logistical according to the tablet-per-child pilot project leader, Martin Debattista and the E-learning director, Emanuel Zammit. Another issue relates to the ways in which the tablets are used as part of the curriculum. Currently they are used to provide additional practice to the main study subjects such as mathematics, Maltese and English. That is, children may be asked to practice mathematical problem solving, reading or writing, although such practices do not take place every single day according to the interviewed teachers. What is of greater interest for the current thesis is that the tablets are not used for any kind of creative production.

From fieldwork conducted three years after the policy's announcement back in 2014, the use of the devices can be classified into two main categories. They are used to support basic literacy and numeracy and they are used to support specific contexts

through audio-visual content and practical exercises. As such, this context provides both an opportunity and an urgent demand to investigate further by not only launching a pilot study within the confines of a classroom but by investigating the larger context of use, including:

(1) Children's own views on creativity, creative production and use of digital devices as well as their everyday practices and interests;
(2) Acknowledging and drawing conclusions from literature about similar such investigations related to digital device use for creative production and also interweaving theories about learning, creativity and the cognitive development of children with respect to why creative production matters.

This investigation and development of model to foster creative production through the use of digital devices can potentially have larger implications to the current use of these devices in primary schools in Malta as well as abroad, where various initiatives to adopt tablets to the classroom have already begun (Fredrickson, Vu, and Crow, 2014).

CHAPTER 2

LITERATURE REVIEW

2.1. INTRODUCTION

Within creativity lies the ability to enquire, question, make new connections, solve problems, critique, collaborate, share, inspire and get inspired, communicate and innovate (Bohm, 1996; Banaji, Burn and Buckingham, 2010; Banaji and Burn, 2007; Amabile and Gitomor, 1984; Brynjolfsson and McAfee, 2014; Gardner and Davis, 2013). These are all fundamental skills in today's rapidly changing environment (Frey and Osborne, 2013).

As digital devices and even artificial intelligence infiltrate every aspect of human life – from friendships to self-driving cars – living standards are changing, compared to previous generations, yet certain aspects of them have not changed (Livingstone and Sefton-Green, 2016). For instance, the importance families and society in general put

on learning and, with that, on education; the role of family in children's lives; the importance of how children spend their childhoods – from who they socialise with to how much time they spend on their mobile devices and their citizen rights that go with such practices (Stoilova, Livingstone and Kardefelt-Winther, 2016) to what jobs they will be able to occupy tomorrow that they have to think of acquiring necessary skills for today (Frey and Osborne, 2013). Some warn that such issues as the future of jobs (Frey and Osborne, 2013). Others emphasize the necessity to restructure education by bringing in novel devices to the classroom (Department of eLearning, 2015) or the necessity to acquire critical media literacy skills (Potter, 2010; Jenkins et al., 2009) to counter greater difficulties as a result of technologies. However, little empirical evidence exists (Livingstone and Sefton-Green, 2016) to support such claims as: "In order to survive the rat race one has to become active, inventive and resourceful, to develop ideas of one's own, to be faster, nimbler and more creative – not just on one occasion, but constantly, day after day" (Beck and Beck-Gernsheim, 2002, p. 23).

On the other hand, while claims suggest that "social reproduction continue to sustain traditional structures of power and inequality", change does not come overnight. Furthermore, technologies bring ecological change (Postman, 1998). The transformations and the impact they have and will have further do not have to come as evidence in a short span of time to accept theories such as Beck and Beck-Gernsheim's (2002) the way it has become hard to predict future employment or education for that matter. This is to say that, while claims about today's growing necessity to provide digital media skills for children or to teach them to be ever more creative may be just that – claims – they do not suggest that one must not anticipate

for any changes to occur. The anticipation of an unknown future must not create moral panics and push policy makers, parents and educators to make radical transformations in a child's life by discontinuing, even discounting previous and past structures and frameworks.

The review of literature is made with three objectives in mind. The first one is to look for the continuum from the past to the present and identify prevailing theoretical frameworks of understanding and studying creativity, learning, play, innovation and technologies in relation to children's development. While views change with the growing empirical research, certain aspects of what has been said about creativity, learning and children's cognitive development persist today. These therefore cannot be disregarded. Rather, they have to be outlined to serve a purpose to depict a larger setting within which one can look for methods to foster creativity and creative production with digital tools.

The second objective, which has guided the review of literature, relates to the main subject who is at the centre of this thesis – the child. The question has been to identify what literature has to say about children's interpretations, perception, cognitive and affective aspects to creativity, creative production, making things and learning – in and outside of school; children's relationships with digital media tools, as well as with parents, educators, structures in which they are placed and often required to abide by. The aim therefore is to look up not only what literature says about what is being done for and to the child in terms of his or her education, development and creativity but also what literature can say about what the child does, how the child behaves and how the child interprets the environment in which

he or she lives, learns and creates. The literature reviewed examines such issues as what children consider creative activities, how creativity contributes to their development and what encourages them to be creative.

The third objective with which reading and review of literature took its course relates to the notion of creativity. This thesis looks at creativity in terms of creative production – making things that matter to children, come as a result of children's interests and imaginations. Creativity here is seen as a process that forms part of a child's cognitive development – the process as well as the outcomes of a child's everyday engagement with his or her environment but also as a way for self-expression and communication, where "creativity involves the physical making of something, leading to some form of communication, expression or revelation" (Gauntlett, 2007, p. 25). To that effect, literature has been reviewed on creativity and learning, creativity and play, and creativity and digital media devices.

2.2. REVIEW OF LITERATURE ON CREATIVITY

Since the focus of this thesis is to understand how children aged seven to ten use digital media devices for creative production and how such creative production can be fostered specifically in schools where digital tablets are being introduced as part of the teaching and learning tools, the literature review here encompasses mainly studies related to the research questions. Therefore, the review made in this document is not exhaustive but rather indicative of the main trends that exist on the

subject of creativity in relation to children and digital media or relate in some ways to the subject of creative production with digital media in or outside school.

Creativity is a widely studied phenomenon. It has been seen through historical, psychological, neurological, cognitive, biological, developmental and even organizational lens. Going back to the Renaissance, creativity has stemmed from the notion of the creative genius, which was cultivated at a time of 'great' discoveries, 'great' artists and their achievements (Banaji, Burn and Buckingham, 2010). Such explanation of creativity possessed by the very few has developed the traditional view of creativity. Such a view continues to exert power even over everyday situations that, through an eight-year-old child's question – "Why should the teacher decide whose Lego creation is the best?" (Recorded during an interview during the research of this thesis) – can demonstrate the risk such views can pose by undermining, disqualifying and denying the efforts and pursuits of everyday individuals.

Some link creativity with intelligence and with personality (Barron and Harrington, 1981). Others (Runco and Albert, 1987) have argued that only a minimum level of intelligence is required for creativeness. An individual's potential, ability and capacity but also the social contexts play a role in their creative performance. With Rhodes's proposition (Rhodes, 1961, 1987) one can look at creativity by focusing on the person, on the process itself, on the outcome or on the press (the environmental, perceived or objective, pressures put on creativity). This split into more or less four categories has, in a way, streamlined research on creativity where some scholars

have dedicated their work on understanding creativity as part of one's personality. In this regard, Barron and Harrington (1981) indicate that creative persons have

> A high valuation of aesthetic qualities in experience, broad interests, attraction to complexity, high energy, independence of judgement, autonomy, intuition, self-confidence, ability to resolve antinomies or to accommodate apparently opposite or conflicting traits in one's self concept, and finally, a firm sense of self as 'creative' (Barron and Harrington, 1981, p. 453).

Focus on creative individuals has led to the idea that intrinsic motivation is a recurring trait. Extrinsic motivations, such as evaluation or rewards, for example, have been shown to inhibit creativity (Amabile, Hadley and Kramer, 2002).

Creativity is not solely seen as an inherent value present in all humans (De Bono, 2009) but also as a trait that depends on social, cultural and situational contexts (Csikszentmihaly, 2013). It is seen as a prelude to and also an outcome of learning. In relation to learning, creativity is not valued only as an acquisition or a manifestation of social or language skills (Clements and Gullo, 1984; Clements and Nastasi, 1992) but also as an action – a demonstration of applied imagination.

Creativity is often seen on two different levels (Gauntlett, 2007). The everyday, small "c" creativity is usually expressed through individuals' personal accomplishments – be that the design of a greetings card, customizing one's computer screensaver, or making a joke. Such everyday creativity becomes the

"external proof of our own personal vitality" (Gauntlett, 2007, p. 29). Then there is the "big-C" creativity, which entails a kind of unique contribution to the domain the specific creation belongs to, is publically acknowledged and validated and has also brought about certain effects or change (Csikszentmihalyi, 1998).

While there are gifted children who can claim place in the discussion of "big-C" creativity, the current research focuses on everyday "little-c" creative production, on the one hand, acknowledging that children have not had time to master skills or accumulate knowledge in any particular domain to demonstrate "big-C" contributions (Russ and Fiorelli, 2010), but on the other, accepting that creativity is inherent to all individuals while the act itself – be that a thought expressed with words or a physical object – is a reflection of everyone's unique individuality.

Creativity is not entirely intuitive nor does it have to be completely original. Rather, it "reflects originality and appropriateness, intuition and logic" (Runco, 2004, p. 664). Cognitive neuroscientist Arne Dietrich (2007) argues that it is wrong to assume that creativity can be localized. In particular, he demolishes the idea of measuring creativity through tests that only point towards specific outcomes – that are judged as being creative or not – when the whole point to understanding creativity should consist of looking at the "underlying mechanisms" (Dietrich, 2007, p. 23) that lead to such outcomes. Therefore, this thesis argues that rather than relying on metric tests and quantitative measurements and classify children as creative or non-creative, divergent or non-divergent problem-solvers, to borrow from Papert (1993), children *make* ideas, they do not *get* ideas. This is to say that children are potentially able to construct personally meaningful creations. The questions that follow are, what

conditions must be met for such creative production to occur? Do children create personally meaningful, creative things with their digital devices? How can they be encouraged to create their own ideas using such tools?

Creativity has also been seen as a process of forming associative elements into new combinations (Mednick, 1962). In relation to digital media reproduction critics have argued how much of the remix of existing elements, widely available thanks to technologies can claim to be creative (Lanier, 2014; Gardner and Davis, 2013).

Furthermore, Feldman, Csikszentmihalyi and Gardner (1994) suggest that creativity arises from the interaction between people, their domain or area of expertise, and the field, in general, and its own members, institutions and expert others. It is through such intelligent interactions that judgements of individual performances in society are made.

In his 'systems' (Csikszentmihalyi, 2013), Mihaly Csikszentmihalyi looks at the creative person who expresses his thoughts and ideas with others in his domain and within that sociocultural context this same person would be encouraged, evaluated and rewarded, or equally discouraged and rejected. The fields and domains can be from a simple classroom to the corporate world. The context, however, matters greatly in how the person's creative potential would be unleashed or suppressed. Csikszentmihalyi further outlines nine elements present during a person's creative "flow" – that is, when one is engaged in an activity, often difficult, painful, and sometimes risky, involving some form of novelty or discovery (Csikszentmihalyi, 1997). These are: Clear goals, immediate feedback, balance between challenges and

skills, merging of action and awareness, elimination of distractions, lack of self-consciousness, lack of fear of failure, no sense of time, the feeling of pleasure from the activity itself (Csikszentmihalyi, 1997 and 2013). In relation to this, the question can be asked as to which activities children engage in with their digital media devices that could make room for or demonstrate these elements as present? If engagement with certain tablet applications allows for the setting up of clear goals, while receiving immediate feedback, achieves balance between challenges and skills, merges action and awareness, allows for taking pleasure for pleasure's sake, distorts sense of time, precludes from fear of failure, will it suffice to say that such activities give children the opportunities to enter in a state of 'flow' (Csikszentmihalyi, 1997)? Can one expect them then to be creative when they engage with such digital devices that afford the elements Csikszentmihalyi speaks of? Or, could the mere engagement with digital devices put the individual in a state of rumination that fulfils nothing more but pleasure for pleasure's sake, allowing children to explore and interact only so much as the software's boundaries afford? A software application can provide for the creative process to present all these elements as defined by Csikszentmihalyi (1996), yet some form of experience and knowledge must be present, accumulated and reached to say that the activity fostered something more than a mere interaction. The engagement with tablet applications must achieve learning and experience, besides Csikszentmihalyi's elements of creativity in order to argue that engagement with such devices can foster creative production.

Csikszentmihalyi's theory of systems also reflects the historical perspective of dialectical materialism – the conflict of social forces – where a thesis forms to oppose a predominant antithesis, which culminates into the introduction of

something new – the synthesis (Csikszentmihalyi, 2013). This view examines creativity over a long period of time – only when such evidence as the development of a new system or an improvement of an old domain has been established. Yet, with ubiquitous mobile digital media devices today and the opportunities for large online participation and creation (Surowiecki, 2004) such prerequisites as domain expertise and domain gatekeepers' acknowledgement are greatly challenged.

The focus on 'press' (Murray, 1938; Rhodes, 1987) puts the creative person in a social context where creativity can be as a result of the relationship between a person and his environment (Rhodes, 1987). Not solely social, pressures can be familial, environmental, structural and so on. Pressures matter, whether perceived or objective (Murray, 1938; Runco, 2004), in that children's engagement with digital devices can be conditioned by their relationships with family, with peers, and, equally, with teachers.

Some studies have also focused on the biology of creativity. In this regard, some have looked on the neurological level of where creativity 'takes place' in the brain. Analysing the brain has led researchers (Dietrich, 2007) to argue that creativity does not mean 'divergent thinking' or an activity that takes place in the right brain only. Rather, even the most conventional thought or action that comes from activity occurring in any side of the brain can lead to something original and novel, while something produced as a result of divergent cognitive thinking can be the least bit creative. Measurement of brain activity has also shown that creativity correlates with two brain states: A quiescent – a relaxed state – and a more active state. The relaxed state corresponds to the inspiration stage. It resembles the stages of sleep and

dreaming. The active stage, on the other hand, is the elaboration stage, which functions well only in combination with the quiescent stage (Martindale and Hasenfus, 1978). This is to say that in order for individuals to generate creative breakthroughs, one must float between periods of low activity, relaxation and reflection and intense activity (Claxton, 1998). This explains the importance of periods of 'incubation' or rest, which has shown to enhance creativity (Ward and Saunders, 2003 in Neumann, 2007). Review of literature related to the neurological explanation of creative processes is relevant only insofar as it supports other theoretical underpinnings that explain creative processes. In relation to rest, some arguments exist in literature that describe that children today remain largely constantly 'switched-on' because of digital devices (Turkle, 2015). The state of rest has become minimal while technologies keep one's mind constantly occupied (Carr, 2015, 2011). On the other hand, the majority of the interviewed children for this thesis have described their typical engagement with their digital tablets as their time in which they relax. It is an unstructured time or, rather, a time that children can decide how to structure it with a degree of independence from adults or educators. Children consider their engagement with digital devices as leisurely partly because it was them who decided the nature of their engagement.

Creativity has also been seen as a set of domain-relevant skills, where task motivation is an important component to individual creativity (Amabile, Goldfarb, and Brackfield, 1990). Dichotomous collaborations, too, have shown to trigger creativity to outstanding levels (Wolfshenk, 2014). Collaboration, seen as one of the four Cs of twenty-first-century skills alongside critical thinking, creative thinking and community (Digital Malta, 2016) helps creativity because an exchange of ideas

takes place and a learning process occurs through the exchange and collaborative work with others (Neumann, 2007).

Antonio Damasio looks at emotion as a factor that triggers creativity (Damasio, 1996). Emotion is also a factor linked in play (Russ, 2003), which is central to creativity. In particular, cognitive and affective processes, some argue, are fostered through play (Russ, 2003). "Openness to one's own emotions" (Russ and Fiorelli, 2010, p. 237) and the expression of "affective fantasy themes" (p. 237) relate to the process of creativity. Fein (1987) and Singer and Singer (1990) have highlighted the importance of play as the safe place for a child to express feelings, thoughts and imagination. Such understanding leads to the importance of personality variables as Russ and Fiorelli point out (2010) that have led to study and thus place importance on characteristics contributing to creativity such as openness to experience and intrinsic motivation (Amabile, 1983, 1996) among others. Focus has moved on to family structures and the role of relationships in the family for children's creativity. For example, evidence suggests that children are more willing to experiment and explore in families with less rigid rules, regardless of the children's socio-economic backgrounds (Kaufman and Sternberg, 2010).

Although not exhaustive, the above review of literature on creativity is of interest to this thesis for at least two reasons. First, the literature draws attention to the importance of the environment in which children live, grow and learn. Second, this review sheds light on a number of elements that can be improved as environment and as conditions to foster creative production through the use of digital devices. For example, while literature points to the importance of motivation, where there may be

low or no motivation, research has shown how various interventions through training can enhance intrinsic motivation (Deci and Ryan, 2008; Guay, Ratelle and Chanal, 2008). Furthermore, making room for play can further lead to an improved problem-solving ability (Drewes, 2006) among other factors that are highlighted further in chapter three.

2.3. DEVELOPMENTAL APPROACHES TO CREATIVITY AND LEARNING

Developmental theories to creativity fit in the initial attempt to understand how children, aged seven to ten, engage with digital media devices for the purpose of making and creating projects, products and personal ideas. Kozbelt, Beghetto and Runco (Kaufman and Sternberg, 2010) say that:

> Developmental theories of creativity are among the most practical. Not only do they help us to understand the roots of creativity, as suggested by the background of unambiguously creative persons, but they also often suggest how to design environments so that the creative potentials of children will be fulfilled. (Kaufman and Sternberg, 2010, p. 26)

However, since this thesis is primarily concerned with finding means to encourage children's creative production through digital media devices that as a long term objective is seen as a way of inspiring independent and self-organised learners

through their engagement in creative production, a review is also made of the research done with regards to learning.

One of the concerns educationalists and policy makers were faced with at the time Jean Piaget wrote "To Learn is to Invent" (1973) was the proportionally small number of students who chose science related careers instead of those in the liberal arts (Piaget, 1973). This resonates with a report developed by the Organisation for Economic Cooperation and Development (OECD) that revealed that less than 5% of 15-year-old girls in the organisation's member states contemplated pursuing careers in a science-related field compared to 20% of boys (Organisation for Economic Cooperation and Development, 2015). The report further outlines the barriers for the gender gap. These include lack of self-confidence – the ability to overcome anxiety towards mathematics or science problems. Also, more boys were found to participate more often in 'hands-on' activities such as internships and job shadowing than girls (Organisation for Economic Cooperation and Development, 2015). Similarly, nearly half a century earlier Piaget posits the hypothesis that it is not that some children have the aptitude to certain subjects – mathematics, physics and so on – but that,

> The so-called aptitudes of "good" students in mathematics or physics, etc., consist above all in their being able to adapt to the type of instruction offered them, whereas students who are "bad" in these fields, but successful in others, are actually able to master the problems they appear not to understand – on condition that they approach them by another route. What they

> do not understand are the "lessons" and not the subject. (Piaget, 1973, p. 14)

Piaget further focuses on the need to look not so much as aptitudes in the children – the varying degrees of demonstrating an ability, say, how well one can draw a representation of a human being (Piaget, 1973, pp. 14, 15) – but the way new concepts are presented to them. In his words:

> Thus, it may be – and we have verified it in many cases – that a student's incapacity in a particular subject is owning to a too-rapid passage from the qualitative structure of the problems (by simple logical reasoning but without the immediate introduction of numerical relations and metric laws) to the quantitative or mathematical formulation (in the sense of previously worked-out equations) normally employed by the physicist. Nevertheless, we willingly admit certain aptitudes (once sufficient maturity is attained) that distinguish strictly deductive from empirical and factual minds, but even in mathematics many failures in school are due to this excessively rapid passage from the qualitative (logical) to the quantitative (numerical).

Thus, the developmental approach to enabling such aptitudes within a particular domain would require certain conditions. The use of an active hands-on approach is one such condition. The child rediscovers, even reconstructs the truth (Piaget, 1973).

The truth is “not simply imparted to him” (Piaget, 1973, p. 15). Furthermore, as Piaget highlights, two misunderstandings downplay such efforts:

> The first is the fear (and sometimes the hope) that the teacher would have no role to play in these experiments and that their success would depend on leaving the students entirely free to work or play as they will. It is obvious that the teacher as organiser remains indispensable in order to create the situations and construct the initial devices, which present useful problems to the child. Secondly, he is needed to provide counter-examples that compel reflection and reconsideration of over-hasty solutions. What is desired is that the teacher cease being a lecturer, satisfied with transmitting ready-made solutions; his role should rather be that of a mentor stimulating initiative and research. (Piaget, 1973, p. 16)

Piaget (1970) maintained that knowledge is not a static construct that can be separated from one’s environment, and, like an entity containing static, objective information about the world the learner can obtain it. Instead, he viewed knowledge and intelligence as processes. Individuals adapted to their constantly changing environment and, as a result, adapted by changing their own knowledge related to it. Therefore, environment and learner remain inseparable. Knowing, according to Piaget and intelligence are the same singular process that changes with the environment. While knowledge is seen as a process that takes place as a result of a learner’s interaction with the environment, intelligence is seen as an organised

system that constructs the structures necessary for the learner to adapt to the changing environment. This is, when children experiment with digital media tools, the expectations should be that they build new knowledge and therefore development of intelligence. However, children's interaction with their direct environment does not always lead to anything concrete. Some studies, for instance, have concluded that experimentation and tinkering with digital media could lead to mere boredom (Lemerise, 1993; Clements and Sarama, 2003). The autonomy and the independence to experiment, construct and try out things may be good for creative thought but too much of it may lead to neither direction nor focus (Albert, 1989). Perhaps, concrete outcomes from experimentation with digital tools do not necessarily have to be the ultimate goal for a child. Tinkering or exploration with digital media, tablet applications and so on does not have to always lead to something concrete. What matters, as Piaget outlines, is that:

> …Knowledge results from continuous construction, since in each act of understanding, some degree of invention is involved. (Piaget, 1970, p. 77)

In other words, it matters that children engage in experimentation because it is exactly through such engagements in continuous construction that children understand and build knowledge.

> …The formation and completion of cognitive structures imply a whole series of exchanges and a stimulating environment; the formation of operations always requires a favourable

> environment for ‘cooperation’, that is to say, operations carried out in common (e.g. the role of discussion, mutual criticism or support, problems raised as the result of exchanges of information, heightened curiosity due to cultural influence of a social group, etc.)” (Piaget, 1972, p. 44).

While Piaget often references knowledge to action, construction and direct contact with the external world, saying that “in order to know objects, the subject must act upon them, and therefore transform them: He must displace, connect, combine, take apart and reassemble them,” (Piaget, 1970, p. 704), criticism abounds with regards to the rigid view he has of children’s development. Specifically, his theory has been criticized as empirically wrong (Siegal, 1991), conceptually flawed (Brown and Desforges, 1977), and one that portrays children’s development in the form of rigid linear progression as a “monolithic, universal, and endogenous” process (Case, 1992, p. 10). The view that children undergo linear progression of cognitive development could potentially give leeway to those with the vested power to instruct and organise learning – be that in the classroom or outside it – and even deny the opportunity for self-expression and self-organised creative production and even an independence or a more pro-active role of the child in the process of learning. This is evident in how digital media devices are being used in the classroom in Malta – the teacher decides how these tools will be used without the children having any say in such decisions. David Gauntlett critiques such limiting views well by saying:

> Children are the ‘other’ group, who do not have the specific type of rationality which is equated with adulthood, but who –

> as in most learning theories – must progress through stages to achieve it. Children are understood rather more as non-adults than they are as young human beings. Thus negatively defined, they become empty or wrongly-filled vessels, who will only complete the long voyage to maturity by adopting a particular set of 'adult' values, perspectives, and models of behaviour. (Gauntlett, 1998b, par. 2)

This thesis then aims to avoid such trappings that children undergo strict stages and seemingly await to gain some rational sense until they are allowed to take a more proactive role in the learning process and, instead, will use developmental theories for those generally accepted observations that children learn by making and trying things out. The supposition here is that children should be given a dose of trust and room for self-expression not be classified or compartmentalised, thus expected to react only in accordance with such pre-set boundaries. Furthermore, in more recent years it has been emphasised that learning does not necessarily begin and end with the classroom (Sefton-Green, 2010). Debates surround issues related to what is recognised as learning to how the type of education children obtain today will serve them in the future (Goldin and Katz, 2007). Networked digital media devices have taken an important role within these debates as children engage with them daily. The sociocultural perspective of what it means to be educated acknowledges the importance of culture and context in which norms and structures of school are drawn out however they do not give an exhaustive definition of what it means to be educated.

While literacy serves to shape society, literacy can also empower individuals to exert its influence in return (Scribner and Cole, 1999). Learning, therefore, is seen also at an individual level, acknowledging the role of personal agency, perspective and experiences in these norms and structures.

On the same token, it must be noted that children's biological and psychological development is not observed in this thesis either as a precursor or a stumble block to any creative production children may engage in. Research shows that very young children (from birth to eight) already engage with portable digital media technologies (Livingstone et al., 2015). Pre-school children already demonstrate the ability to navigate, create and explore through and with digital media technologies (Marsh et al., 2016; Blagojevic et al., 2012; Cohen, Hadley and Frank, 2012). While most five-year-olds may not be able to read and write yet, they learn and acquire a range of digital literacy skills including understanding and using digital interfaces, critical-thinking and problem-solving in digital domains (Bers et al., 2014). Furthermore, Colvert (2015) identifies the processes of meaning making when an individual has the need or interest to communicate a message – design, production, dissemination and reception. Here communicating a message can take many forms, not specifically text-based but any kind of artefact (Kress, 2010). Specifically, children engage in creative production of a personally meaningful message that they want to communicate. Then the nature in which the message would be conveyed is designed by its owner. The owner of the message decides upon the design, the structure, the tools (digital media technologies or any other) and the ways in which this message would be disseminated.

Colvert's conceptualisation of media literacies (2015) reflects Green's (1988) according to whom literacy is seen as a social practice that has operational, cultural and critical dimensions. That is to say that, at the operational stage, the user acquires operational skills. For example, the user learns the letters of the alphabet; understands general rules and "meaning making systems" (Marsh, 2016, p. 199). The cultural dimension relates to the manner in which the user connects and understands texts and artefacts within their cultural environment where these texts or artefacts are used, created or experienced. The critical dimension allows children to "deconstruct texts and artefacts in order to recognise and understand" (Marsh, 2016, p. 200) the dominant forms of the cultures and the social environments which they inhabit. While others have looked at pre-schoolers' abilities to construct meaning, critically view texts and artefacts, and acquire digital media skills as they navigate through and engage with technologies, this suggests that older children, as the studied age group between seven and ten, can just as freely demonstrate such abilities and skills. Some research (Bulman, 2015) has pointed to the difficulties young children in particular may encounter with the ability to critically analyse media messages. Yet others (Vasquez and Felderman, 2013) have demonstrated that teachers can help improve children's critical literacy skills. Nevertheless, this study does not aim to interfere with or affect children's creative abilities with digital media technologies. Rather, the scope is to look at what their current practices are in terms of creative production and what they can creatively produce – as a form of self-expression and as an opportunity to self-organise into making personally meaningful creations when prompted to do so.

Thus, studying and understanding how children interact with digital media devices – what their experiences, viewpoints and interests are reflected in how they engage with such tools must be examined in light of schools' intended structures of putting such devices into use. If schools perpetuate the notion that children's intellectual capacity undergoes rigid stages of development and base their decisions and rules with regards to how and for what purpose digital media tools will be used on this premise, then it is highly likely that children's perspectives or interests in creative production or even opportunities for creative production will be limited and highly dictated by such external decisions as that of the schools. Such conditions surely would not allow the child to fully benefit from the affordances of digital media tools, let alone demonstrate their capacities for creative thought, independence and self-navigated learning. One way to avoid such a top-down approach to controlling children's use of digital media devices then is to change the conditions in which children are being observed and/or their skills 'tested' with regards to what they might know or understand in any given developmental 'stage' and instead, be given a platform where children can be creative makers and - through making - show what matters to them, how they view the things that matter to them, or are curious about. Specifically, the following conditions could potentially enrich the understanding about children's development and creative thought – conditions that this thesis aims to adhere to:

(1) The condition relating to the type of method for encouraging creative production. More conventional methodologies such as discussions through interviews, controlled experiments or even focus groups can be restrictive to a researcher who tries to understand children's interpretation and use of

digital media – what they are interested in making with digital media tools, and even how, or what they might be learning as they engage with such tools. Such more conventional methods of research can be used for obtaining *some* information from the children but not good enough to understand what creative producers they could be since such methods can lead to restricting the respondents to express themselves mainly verbally (Holzwarth and Maurer, 2003; Gauntlett, 1997). Whereas a more creative method of research (Gauntlett, 2007) can enable, on the one hand, to compare findings with those gathered from more conventional methods such as interviews, but also – and mainly – to allow children to create something meaningful to them without being restricted how to use the tools given to them and without being made to follow pre-set conditions of an experiment.

(2) The condition relating to encouraging hands-on experience – the process of discovery and rediscovery through construction and scaffolding of knowledge as pertained by the assimilation-accommodation process of learning (Papert, 1993). This issue directly links with the previous one and supports the decision to use such creative method to 'test' children's creativeness through the use of digital media devices. Instead of asking them to describe what one could do or make with such tools, children should be encouraged to demonstrate their interests and perspectives by making their own projects, hands-on.

(3) The condition relating to the availability of time and space for (1) and (2) to occur especially inside the classroom where digital tablets become part of the

learning tool. They begin to use digital media technologies at a very young age. Moreover, children use their digital devices in various ways that more often than not differ from how such tools are incorporated into the classroom. Some of the freedom children may have had outside of school can be lost in the classroom. Time and space must become available for discovery, construction, as well as trial and error in order for children to build on their knowledge and do so creatively with the tools at hand.

2.4. THE IMPORTANCE OF SELF-MOTIVATION TO CREATIVITY

The leading learning mechanisms in social-cognitive theory are children's ability to observe and mimic cognitive and affective behaviour (Gredler, 2009). However, according to Bandura's social-cognitive theory (1989), the observed and copied behaviour further depends on the self-efficacy – the self-belief and confidence of the learner that he or she is capable of such performance. While social-cognitive theory has been heavily criticised (Tryon, 1981; Hart and Kritsonis, 2006) it is only drawn into this thesis for two reasons. Since the subjects of this thesis are aged seven to ten, some research has shown that at that period of their lives a general 'slump' in creativity may occur (Guignard and Lubart, 2006; Runco, 2007). While criticism abounds questioning the validity of creativity tests that measure and identify 'levels' of individual creativeness (Gauntlett, 2007; Kim, 2006; Gardner, 1993; Plucker, 1999), it is considered in this thesis that conventionality – conformity to rules and expectations, expressed and imposed through the structures of school in relation to

how digital media devices are used there currently (Department of eLearning, 2015) – may negatively affect children's creativeness by leaving no room for self-organised use, self-expression through personalised use and self-organised creative production and demonstration of personal interests and motivations through such tools. Therefore, the creative method to use in this thesis aimed to break away from the rigid impositions of use of digital media devices as currently happens in the Maltese classrooms, in order to avoid such possible conventionality and 'slump' in creativity (Runco, 2007) to occur. It is also valid to acknowledge that while some may argue about 'slump' in creativity, the interviewed children in this thesis have demonstrated enthusiasm in their engagement with digital media. Moreover, children display motivation to engage with digital media by spending long hours on them daily (Ito, et al., 2009; Livingstone et al., 2011). While such motivation is evident in their interaction with new media it is another issue how much they engage in the creating novel things with such tools. As Mitchel Resnick states, children quickly learn and know how to interact with digital media, however "it's almost as if they can read but can't write" (Resnick, 2012). So, while a possible slump in creativity may exist, digital media tools – and the excitement surrounding their use – can act as safe venues to practice novel thinking and trigger creative production. Analogously, pretend play or various forms of artistic expression such as movies and video games can serve a similar purpose (Russ and Fiorelli, 2009). As Sandra Russ and Julie Fiorelli argue, "there may not be a fourth-grade slump in the creativity of story narratives" (Russ and Fiorelli, 2009, p. 235). Therefore, if children are motivated – or at least allowed in the classroom – to engage in the creation of audio-visual or text-based personal narratives through the use of digital media tools the tendency of such 'fourth-grade slump' in creativity may never exist.

The second reason for referring to social-cognitive views to learning relates to the question of self-efficacy, which connects with the three orientations that have implications for motivation. These are autonomy, control and impersonal orientations (Deci and Ryan, 2008) and they form part of the self-determination theory, which posits that:

> The type or quality of a person's motivation would be more important that the total amount of motivation for predicting many important outcomes such as psychological health and well-being, effective performance, creative problem solving, and deep or conceptual learning. (Deci and Ryan, 2008, p. 182)

Thus, according to the self-determination theory autonomy orientation has been positively linked to psychological health and effective behavioural outcomes, which also can include creativity. Consequently, the self-determination theory has been helpful in explaining how teachers' controlling practices have had detrimental effects on student self-motivation (Guay, Ratelle, and Chanal, 2008). Similarly, flexible parenting styles have also contributed to willingness to try out new things, experiment and take risks (Mouchiroud and Zenasni, 2013).

Attention is made to such factors as self-determination and motivation for two reasons. First, self-determination theory interlinks satisfied needs for competence, autonomy and relatedness to positive behavioural outcomes (Deci and Ryan, 2008).

These, in return, interconnect with the internal conditions such as psychological safety and psychological freedom, which, research has shown, relate to fostering creativity (Harrington, Block and Block, 1987; Singer and Singer, 1990; Lubart, Mouchiroud and Zenasni, 2013). Psychological safety and psychological freedom – affected by "autonomy support" (Guay, Ratelle and Chanal, 2008, p. 236) – are further expressed through the types of child-rearing practices in the out-of-school domain and specific teacher autonomy support practices within the school domain, both of which have been effective in fostering children's motivation towards learning (Reeve, 2006; Ryan and Grolnick, 1986). Relatedly, studies have shown that parents with flexible rules have children with greater creativity (Lutrey, 1980 in Mouchiroud and Zenasni, 2013) Similarly, encouraging children to deal with a variety of frustrations and challenges is important to the development of their autonomy – a common feature among creative adults (Albert, 1996 in Runco, 1996). Parental and teacher support for children's autonomy further relate to a number of personality variables important to creativity (Russ and Fiorelli, 2009).

Intrinsic motivation (Amabile, 1983), openness to exploration (McCrae and Costa, 1987), and risk-taking (Sternberg, 1988) are all traits that explain the second purpose for interweaving the self-determination theory into this thesis. While all these aspects of the developing child and the question of fostering his or her creative production through the engagement with the external environment, in general, and digital devices specifically also connect to the important role of play (Vygotsky, 1966, 2004; Fein, 1987; Brown, 2009).

While literature points to the factors that affect self-motivation, autonomy, and willingness to risk-taking, experimentation and exploration, this is not to say that such traits cannot be developed or stimulated through training or intervention. Educational intervention has been conducted in various ways (Ott and Pozzi, 2012; Suárez-Guerrero and Lloret-Catalá, 2016). From intervention short-term courses on critical thinking skills of mainstream media (Orlando and Farrelly, 1987) to linking popular cultural artefacts and material, which children enjoy outside school, to the mainstream curriculum (Marsh et al., 2015; Willett, Robinson and Marsh, 2011; Loveless, 2010) to creating awareness of various issues by asking children to make audio-visual projects (Gauntlett, 1997). Similar interventions and training can aim at stimulating and developing self-motivation, critical enquiry, creative exploration of personal interests and so on. The effort to develop a method to foster creativity through the use of digital media devices acknowledges such prospects that can contribute to more self-motivated children willing to experiment and become creative makers and better learners. In other words, a method to foster creativity should include in its design strategies to stimulate self-motivation, autonomy and self-determination to experiment, explore and build creatively with such tools.

2.5. THE ROLE OF CHILDREN'S SOCIO-ECONOMIC BACKGROUND ON THEIR LEARNING AND CREATIVITY THROUGH THE USE OF DIGITAL MEDIA

A large body of research has looked at the digital divide among rich and poor (Cleary, Pierce and Trauth, 2005; Warren, 2007; Kyriakidou, Michalakelis, and Sphicopoulus, 2011). Some suggest that digital media gap mirrors pre-existing socio-economic inequalities (DiMaggio et al., 2001; Ono and Zavodny, 2007; Longley and Singleton, 2008). From discussion focusing on those who have access to digital media technologies versus those who do not, research has also emphasised the gap that exists in relation to the breadth and depth of use of digital media technologies among the various socio-economic groups (Kvasny, 2006; Ribak, 2001). Research evidence abounds in relation to the potential benefits digital media technologies can have on the learning of children from poorer backgrounds. Soloway and Norris (1998) have demonstrated how computer programs can help children with reading and maths. Students with longer use of computers in school perform better on PISA mathematics examination (OECD, 2005).

Hohlfeld et al. identify three levels of digital media divide (2008). These include access to technologies, frequency of use of the technologies at hand, and "how technologies are used to empower the individual within the context of a school" (Hohlfeld et al., 2008, p. 1650). Kim and Kim (2001) explain that the "key to bridge the digital divide is not access to or utilization of high-tech information devices or facilities but whether the user knows how to use them [digital media tools] for the

betterment of their quality of life" (p. 85). Further research points to the various discrepancies that exist among more affluent and less privileged children and their use of technologies. For example, Wayne at al. (2002) found that students from low-income backgrounds used computers much more for drill and practice than their richer peers. Wenglinsky (1998) found that high-income students spent more time on computer activities that involved higher-order thinking unlike children from poorer backgrounds. Further studies have investigated how socio-economic backgrounds relate to how teachers used computers professionally (Wayne et al. 2002). For instance, primary school teachers in schools of children from poorer backgrounds were 8% less likely than their colleagues from richer schools to use computers for professional activities outside of instruction. The same has been identified among secondary level schools where teachers in schools of poorer children were 26% less likely to use computers outside of instruction (Wayne et al. 2002).

Within the context of this thesis, the interest leans towards the last, third, level of digital divide. Specifically, an investigation is made whether children from different socio-economic backgrounds use digital media tools for creative production. Moreover, the objective of fostering creative production through the use of digital media tools can be seen as a way to narrow the divide that may exist among more and less privileged children in their engagement with digital media technologies.

2.6. THE ROLE OF PLAY WITHIN THE SUBJECT OF CREATIVITY

It is important to consider the role of play as a cognitive process and one that directly relates to creativity (Russ, 2004, Singer and Singer, 1998). Play is central to creativity for a number of reasons. According to the Russian developmental psychologist Lev Vygotsky (1978) play is essentially creative engagement with one's environment. In Vygotsky's words:

> We can identify creative processes in children at the very earliest ages, especially in their play. A child who sits astride a stick and pretends to be riding a horse; a little girl who plays with a doll and imagines she is its mother…all these children at play represent examples of the most authentic, truest creativity. (Vygotsky, 2004, p. 11)

The relevance of play to this thesis is two-fold. First, some of its cognitive aspects put an emphasis on the relationship between user and tool, skills and innovation (Marsh, 2010). In the ubiquitous presence of technologies, emphasis is increasingly put on these relationships. Some of them are expressed in the pressure and urgency being amassed for children and young people to acquire digital media literacy skills. However, as children grow, less space is afforded to imaginative play in school, which, some argue (Maisuria, 2005), has erased any opportunities for playful explorations in the classroom.

The second reason why play is relevant to this thesis is that it is central to a child's life. Play is child's work (Piaget in Papert, 1993). Through play, children undergo complex cognitive processes that also link to creative problem solving (Sylva, Bruner and Genova, 1976). A large body of literature links play with creativity (Banaji, Burn and Buckingham, 2010; Marsh, 2010; Marsh et al., 2016).

Play, according to Russ (2003) fosters divergent thinking. Children use everyday objects to represent different things that suit their imaginative play. They role-play and imagine situations by continuously expanding their vocabulary of associations, tapping into and exercising their divergent skills (Russ, 2003). Similarly, certain software applications and video games allow children to build their own dream worlds, create avatars and experiment with characters, role-play and explore environments that the physical world cannot or does not necessarily cater for. An example is the game of Minecraft – a "sandbox" type video game where the player can move freely and tackle objectives, objects and obstacles relatively independent of any rules (Mojang, 2009; Raven, 2014).

The relationship between play and creativity accentuates the very essence of and potentials digital devices can offer. As Russ suggests, "play has been found to facilitate insight ability and divergent thinking" and "theoretically, play fosters the development of cognitive and affective processes that are important in the creative act" (2003, pg. 291). Similarly, Vygotsky (1978) acknowledges the importance of social context by saying that play involves the social way of using tools in order to make meanings. Meanings become dependent on the user's imagination. Children explore digital devices – furnished with all sorts of apps – to play, draw, read, make

videos, take and manipulate pictures, music and so on (Marsh et al., 2015; Marsh, 2010).

The element of play is present in most of these activities. Vygotsky's view of creativity in children establishes a framework under which he sees imaginative work being accompanied by rational thought (Vygotsky, 1966; 1978). This framework can well match an analysis of situations in which children build their own computer games, using software such as Scratch (Resnick, 2015). Many video games have strict rules governing the production processes while at the same time children build through playful and creative explorations (Gee, 2007).

Playfulness further has entered the lexicon of those who discuss creativity in connection to digitally enhanced environments. Richard Florida (2002), for example, argues that creative people spend little time on routine problem solving through conventional paths. This reflects well with the capacity to engage in creative thinking and action – serious intellectual play, which Jennifer Pei-Ling Tan (2008) has termed as cognitive playfulness. Tan's research has led to the belief that certain individuals have the learning disposition to playfully engage with novel ideas and try things out, which often results in increased levels of innovativeness and individual learning achievements. In her research, Tan looked at how a student-led digital learning innovation, called the Student Media Centre (SMC) functioned for about a year, specifically, what learning dispositions motivated students' differing degrees of use of the SMC as part of their schooling practices. Tan's research takes off from Carol Dweck's work (2000) on self-theories, which posits that individuals possess two types of goals: *Performance goals* – ones, focused on "winning positive

judgments of your competence and avoiding negative ones" – and *learning goals* – the desire to develop "new skills, master new tasks or understand new things" (Dweck, 2000, p. 16).

Where individuals put priority on their performance goals, they seem to leave little room for trial and error, alternative modes of answers, testing things out and taking risks. In other words, they leave little room for creative explorations. What Tan's study found was exactly that: Students who exhibited higher levels of cognitive playfulness relative to their peers, appeared to report higher level use of the SMC (2008). Similarly, those students who reported little use of the SMC reported relatively low levels of cognitive playfulness – with that, intrinsic motivations, not just the goal to get good grades and avoid negative judgement – lead one to learn new things and acquire new skills. Cognitive playfulness will lead one to appreciate the affordances of digital devices. Those with higher levels of cognitive playfulness are also more likely to take on the opportunity from such tools to improve on and acquire new competencies (Tan, 2008).

The importance of play has taken yet others to delve into the question of learning and creative opportunities that can derive from playing video games. Nevertheless, creative explorations through technologies, video games playing or design, have sparked arguments on both ends of the spectrum. Some have come to defence video game playing, which afford a safe form of social and cognitive learning (Gee, 2007). James Paul Gee (2007) argues that when one learns a new semiotic domain in an active way – such as one presented by video games' environments – the user learns "to experience (see, feel, and operate on) the world in new ways" (p. 24).

Socialization with other players opens opportunities for more learning. Users "gain resources that prepare us for future learning and problem solving in the domain and in related domains" (Gee, 2007, p. 24). However, it is important to note that video games can provide such opportunities, but do not necessarily guarantee such results. Gee parallels this view with what psychologist Eric Erickson calls a psychological moratorium – "a learning space in which the learner can take risks where real-world consequences are lowered" (p. 59).

The creative output from interconnectedness of play and learning (Amabile and Gitomor, 1984; Lieberman, 1977; Iverson, 1982) is of interest here insofar as the creation has meaning and value to the creator and is not just a manifestation of mechanical production (Loveless and Taylor, 2000; Banaji, Burn and Buckingham, 2006). Therefore, digital skills and digital literacy – as they will be discussed in detail later in the text – are of value to be examined within the context of this research. Nevertheless, they are neither a prerequisite nor they must be the sole aim in children's education or allocated time to engage with digital devices.

The main concerns in this thesis relate to the opportunities children aged seven to ten are given for playful exploration in general and specifically in relation to creative production through the use of digital media devices and how such production can be fostered in the classroom where such devices will form part of everyday learning processes. Marsh (2010) highlights Appadurai's global cultural 'scapes': Ethnoscapes, Mediascapes, Technnoscapes, Financescapes, and Ideoscapes, in which people interact, live and learn. Specifically, Mediascapes further enter children's worlds through the technologies at their disposal, essentially leading to the

understanding that creativity "is not so much related to toys and artefacts themselves as to the social and cultural context in which the play takes place and the level of the child's take-up of the affordances offered by the toy or artefact" (Marsh, 2010, p. 26). This resonates with Vygotsky's framework for play and learning in general. To Vygotsky, play as a symbolic act is expressed through the social use of tools to make meaning (Vygotsky, 1978). Such an understanding therefore puts an emphasis on "how imaginative and playful processes are negotiated with others through external resources" (Banaji, Burn and Buckingham, 2010). Learning through creative play and creative production becomes dependent on the cultural context. The role of play through the use of digital devices remains to be examined when children themselves become the creators of the rules, the narrative and the design of their objectives, alongside the thought, problem-solving, collaboration and purpose related to such creative work.

2.7. CREATIVITY AND DIGITAL DEVICES IN THE CLASSROOM

While the main focus of this thesis is not on pedagogy – creative pedagogies and creative use of digital media tools for instruction and teaching – reviewing current practices will give a better, more holistic understanding of the context in which the studied children learn. An analysis of how digital devices are currently put to use in school where that already happens will help to identify the commonalities and differences between children's practices in and outside school. Moreover, such analysis can help design methods to foster creative production through digital devices where fostering creativity can have larger implications on children's learning

in the classroom (Ejsing-Duun, 2016; Kim et al., 2014; Suárez-Guerrero and Lloret-Catalá, 2016).

Research on creativity within the sphere of education sheds light over the negative effects strict guidelines to instruction, streamlined assessments and expectations to conformity can have on creativity (Runco, 2004; Papert, 1993; Gardner and Davis, 2013). The pressures to conform and follow instructions and undergo tests that allow little or no room for the assessed to think for alternative answers can discourage creative thought. On the other hand, from a Darwinian aspect, the fittest will attest to the challenges (Wallace, 1866); from an economic viewpoint, scarcity can trigger creativity (Neren, 2011). And yet, as counterargument to this, literature has shown that creativity flourishes in the classroom where activities are offered in the form of a game rather than strictly as instruction (Graham et al., 1989; Rubenson and Runco, 1992). According to some literature, it is not so much the teacher's influence on the creative release but creativity itself that influences teaching (Rubenson and Runco, 1992; 2004).

The preliminary observations conducted during 2014, the first year of this thesis, revealed how one teacher, whose class took part in the tablet-per-child pilot project (Ministry of Education Malta, 2014), made successful use of Kahoot, a software application for tablet. The app allowed learning and assessing pupils' knowledge on a science subject, in the particular lessons that the observations took place that was biology. With the teacher's personal decision to enrol Kahoot as the measurement and learning instrument, the class played a competitive game during which they also tested their memory and knowledge on the subject. Besides the excitement that was

noted during the observation while the class played Kahoot, their teacher further observed that her pupils had learned quicker than usual while arguments can be raised with regards to the type of learning (memorised information, assessed via multiple-choice game-like test) the "enthusiasm to play a game", as the teacher described, had inspired her to look for new games and ways of using the digital tablet in her classroom.

> When I see them shrieking like that and all of them wanting to answer, pressing their answers [on their individual tablets] and when they see their scores, they get so excited…I can test their maths and their spelling. It's like a snowball. I see they get exited and that makes me really enthusiastic myself. I go home and then I start reading ... It takes me a long time…no one pays me for that extra time … the best part is that I can see them [the students] learning and taking part and being a lot more attentive and focused. I just have to keep it up to make sure it doesn't get boring and it doesn't remain the same otherwise they'll lose interest. (Primary school teacher, church school)

However, such experience demonstrates how creative use of technologies, from pedagogical perspective, largely depends on the individual educator – the teacher's independent initiatives, approach, attitudes and even creativity. Moreover, this shows how the teacher gains total control over how, why and when the tablet device would be used, putting pressure on the pedagogical skills rather than on the individual learner to explore creative potentials independently. As the digital tool remains in the

control of the teacher, the focus shifts more on assessing the level of creative pedagogy than the creativeness of the learner. This is not to say that one excludes the other. This is to attest that a distinction must be made as to the availability of independent initiative as well as context for the learner to creatively engage with digital media devices within the school domain.

Ultimately, this is an example that "educational materials and activities simply add a thin layer of technology" (Resnick, 2017, p. 22). The assessment becomes more exciting because of its nature – a game of questions with right and wrong answers which merely steers a large group of children to do the same thing – answer a question and aim for a "right" answer prescribed by the curriculum. That certainly is not all the creative opportunities these same tools are meant to foster and certainly that is not the type of activities children engage in outside school when they are in full control of their digital devices.

Finally, this is an example of creative use, not specifically creative production from the children's perspective. The main interest of this thesis is to identify the opportunities given to children to creatively develop their own concepts and ideas, put these into results of their own endeavour. Creative affordances of technologies suggest that these provide certain learning or experiential opportunities that other technologies, such as crayons and paper or Lego blocks, for example, do not. In this respect, Avril Loveless, for instance, argues that digital media tools can foster creativity because certain revenues have not been accessible or possible to use or delve into without the new technologies (2003). Loveless suggests that technologies generate new streams for creativity thanks to features such as provisionality,

interactivity, capacity, range, speed and automatic functions (Loveless, 2003). However, the features Loveless describes can be attained even in the example with the Kahoot game (the children themselves can construct the game using the software and apply any text from any subject from their curriculum to convert it into a multiple-choice test). Yet, this is still not the environment in which children can experience the opportunities to self-organise into making something creative and something that is the process of their thinking, understanding and perspectives. What matters for this thesis then is the opportunities technologies give beyond the provisionality, interactivity, capacity, range, speed and automatic functions to include the sense of independence and control children can have when they engage to make things with such tools (Sinker, 1999). Then, in the context of the classroom the question remains as to whether children are allowed to creatively express themselves when they are handed the digital tablets. The preliminary qualitative data collected during the first year of this thesis showed that current practices in the Maltese schools lack evidence with regards to creative production through digital media devices.

There were several reasons for the lack of fostering creative production with such tools in the Maltese primary schools. First, innovative ways of using digital devices are still limited not only for the local population but elsewhere, too (Conole and Culver, 2009). Only slowly efforts are being made to encourage creative production through digital devices as a form of fostering creativity in the classroom (Ejsing-Duun and Skovbherg, 2016) by making (Bruns, 2006) and playing games (Kafai, 2006) or by making podcasts (Cebeci and Tekdal, 2006). There has been research in the past related to various computer technologies, not specifically digital tablets and

apps (Resnick, 2002; 1998; Clements and Sarama, 2002; Clements and McMillen, 1996). Nevertheless, no such research efforts have been made in Malta.

Second, the ladder of online opportunities (Livingstone and Helsper, 2007), a useful term that can find analogy in 'a ladder of creativity' when using digital media devices, still shows that children, aged seven to ten, use such tools for a fairly limited number of purposes. New use requires learning new skills. Once and if children acquire new skills, they do not necessarily move up another level, for example, for creative production. And while research shows that as children grow older they become more versatile users compared to their younger peers, active creative production through digital media still lacks among children overall (Kalmus, et al., 2009). This leads to the main question of this thesis: How to foster creativity, specifically creative production, through digital media devices; with an emphasis that such efforts should begin in school.

2.8. CREATIVITY AND DIGITAL MEDIA DEVICES

Creativity can no longer be seen as centralised and directed by the structures of societies (Banaji, Burn and Buckingham, 2010). Internet-connected devices disrupt the social and political structures; strip domains of its gatekeepers; allow researchers, scientists, social psychologists and the like to talk about everyday creativity (Craft, 2002; Banaji and Burn, 2007; Gauntlett, 2007, 2011; 2015). Where creativity was considered a quality, a gift possessed by the very few in the pre-Internet era – the

notion of the artistic genius (Negus and Pickering, 2004) – today creativity seems to come closer to the notion of entrepreneurship (Deresiewicz, 2015). Creativity has come to be seen as an innate characteristic to all humans, exercised and expressed with varying amplitudes and outcomes.

The various claims made about creativity's origination, definition, purpose or value (Banaji and Burn, 2007) have opened debates and equally provided opportunities about the decisions that will be made regarding children's education. To take on Banaji, Burn and Buckingham's view of creativity, seen holistically as a combination of rhetorics drawn from academia, policy and practice (Banaji, Burn and Buckingham, 2010), this thesis focuses on the rhetoric that certain technologies – digital tablets – provide opportunities for children to be creative makers and to learn through creative production. This section reviews three main issues related to digital media devices and creativity.

The first one relates to the supposition that the various rhetorics seem to merge or at least interweave into one another, thus giving creativity even more importance as an economic, social and personal skill, a means for self-expression, a human trait and desire to demonstrate existence, personal perspective and experience. Identity construction, for instance, takes centre stage in young people's lives. Digital devices offer platforms for identity creation and expression with very little obstacles or effort on the user's part. Children, as young as five, are aware of many social and cultural phenomena (Schor, 2004; Twenge, 2006). Children's commercialisation (Twenge, 2006) and active participation grows (Sharpe et al., 2010), as digital devices become an everyday implement (Ito et al., 2011). Such growing interest and active input as a

result of digital devices is what makes online services such as Instagram, SnapChat, and YouTube thrive. Such opportunities for active participation, for contribution and therefore opportunities for bringing change merges the rhetorics of the democratic, economic, political and cultural nature of creativity. This further highlights the importance of creativity and the efforts to foster creative production with such everyday tools.

The second issue relates to digital media devices seen as platforms for free and alternative ways to self-expression as well as exploration of concepts regardless of any developmental stages children may be assumed to follow (Piaget, 1973). That is, there is a certain amount of freedom never before available to children to use digital media devices to express themselves in various ways, to construct ideas, to experiment with concepts and to delve into subjects all of which may have otherwise been constrained or controlled by an authoritative system that concedes to the understanding that children undergo strict stages of development, that respects levels of attainment, that allocates a fixed number of lessons with fixed allotted time. While concerns may arise as to the appropriateness of the content children can access – the things that they leave as digital footprint and the connections they make online – thus putting themselves at risks (Livingstone and Haddon, 2009; Livingstone, 2017) research also demonstrates that less use of networked devices does not necessarily reduce online risks however higher use can lead to acquiring more digital media skills and therefore more opportunities (Livingstone et al., 2011, 2014a; Livingstone and Blum-Ross, 2017). Furthermore, digital devices facilitate safe and free explorations that physical environments do not or cannot necessarily provide (Gee, 2007; Resnick, 1998; Loveless and Williamson, 2013). This is in line with the

cognitive theoretical view of creativity that suggests that creativity can be fostered when at least two conditions are met – that of psychological safety and psychological freedom (Harrington et al., 1987). In this regard, software applications today allow for children to build DNA structures, explore planets, dissect and investigate cell structures, simulate flying, build virtual environments and so on (Brunsell and Horejsi, 2012). Added to that, children can learn new concepts in concrete manner through audio-visual support as well as through safe trial-and-error practice (Resnick, 1998). Children can develop projects using digital devices to express their own view and understanding of important topics such as the environment (Gauntlett, 1997). Software applications allow children to actively construct and experiment new concepts or explore existing knowledge rather than sit passively, waiting to be instructed (Resnick, 1998; Clements and Sarama, 2002).

Interaction with digital devices, such as computers and software applications, has shown greater effectiveness than toys in that the former has shown to stimulate higher levels of social play (McCormick, 1987). Even the physical organisation makes all the difference. Where digital devices encourage individuals to group together and share, rather than sit apart, isolated by the digital device, children exchange ideas, communicate more and learn more (McCormick, 1987). Some studies in the past (Resnick, 1998; Resnick, 1998) have shown that digital devices can support children to learn abstract concepts from maths or dynamic systems that would otherwise be too advanced for their age. More recent studies (Lieberman, Bates and So, 2009; Kim, 2011) show that digital devices provide settings for collaborative learning, reasoning and problem-solving activities that have otherwise been thought too advanced for children's ages.

Digital media has shown to positively affect teaching and learning advanced concepts and processes. Programmable Lego bricks and digital beads have been used as the so-called "digital manipulatives", developed by MIT Media Lab, to encourage children aged five and older to explore the concepts of feedback and emergence (Resnick, 1998; Resnick, 1998). Lego Mindstorms allow children to program their colourful brick creation and develop a two-way communication with it. Through their programmable brick-made robots, children can discover, observe and practice communication skills, behaviours and consequences of their actions and manipulations. The digital environment allows children to test ideas and practice skills that would later serve them in real case scenarios (Lieberman, Bates and So, 2009; Lieberman, Fisk and Biely, 2009). The principles behind the digital manipulatives encourage children to be active participants, "giving them a greater sense of control over (and personal involvement in) the learning process, in contrast to traditional school activities in which teachers aim to "transmit" new information to the students" (Resnick, 1998, p. 44-45); encourage interdisciplinary learning, "pluralistic thinking, avoiding the right/wrong dichotomy prevalent in most school math and science activities, suggesting instead that multiple strategies and solutions are possible"; make room for "reflection. A child's constructions serve as external shadows of the child's internal mental models – providing an opportunity for children to reflect upon (and then revise and extend their internal models of the world)" (Ibid.). Lastly, a child is encouraged to "put themselves in the minds of others, since they need to think through how other people will understand and use their constructions" (Ibid.). In connection to this, can similar principles be adopted and adapted to the classroom where children will use digital tablet applications for

learning? Specifically, can creative production through digital media devices be encouraged along with active participation, interdisciplinary exploration, pluralistic thinking and reflection?

The third issue relates to how creativity with digital media devices is seen and perceived, as understood from review of the literature on the subject. Creative production through the use of digital media devices is sometimes seen as mere replication of already existing material that may not always qualify as creative (Lanier, 2014). Some critics argue that children reproduce, replicate and simply produce products that do not necessarily have meaning using digital media tools (Gardner and Davis, 2013). If children simply engage in ad hoc projects without being given the time and the flexible pace to base their creations on something personal and meaningful, production with digital devices can therefore be seen as purely mechanical more than creative (Loveless and Taylor, 2000). However, there are other factors that must be highlighted when arguing if children create 'uncreative' and 'copycat' material or original and meaningful things with digital media. First, various conditions could potentially stifle even preclude children from making creative and meaningful things through the use of digital media devices in or outside school. Rigid organisation of school timetables, overloaded curricula and tight schedules to cover the syllabus in time for assessment, extra curricular activities and less free time for play are some of the issues that remain largely unresolved and with some degree in the way of creative potentials (Maisuria, 2005; Bassock, Latham, and Rorem, 2016). Second, the issue is not only in relation to the lack of time and space for creative production through digital media devices in school but also to the lack of adequate methods that can enable such creative production. For

instance, the children interviewed for this thesis take ICT lessons in school as an individual subject at least twice a week, just like they attend mathematics, literature and religion lessons. The preliminary research conducted for this thesis has identified that the studied children do not have any opportunities during ICT lessons in which they can engage in self-directed creative production using computers or digital tablets. Third, parents' and teachers' perceptions of creativity with regards to children's use of digital media devices can also limit or steer children's use in various ways that may not necessarily lead to creative potentials. In one study, Reid et al. (1993) found discrepancy between teachers' perceptions of what they considered creativity and the elements that supported the most creative uses of a digital video. The study found out that teachers perceived creativity as opposing to convention, breaking down barriers, and liberating oneself from the limitation of structures. However, the most creative way of using digital video came from strict adherence to structure, attention to the language of the film, and to carefully structured tasks. While this study leads to suggest that creativity requires digital media literacy and can be dependent on the type of the pedagogic practice it also emphasises on the importance of teachers' and parents' perceptions, understanding, attitudes and role in any efforts to foster children's creative production through digital media devices.

2.9. REVIEW OF CRITICISMS RELATED TO DIGITAL MEDIA USE ON CHILDREN'S CREATIVITY

In review of the criticisms with regards to how the use of digital media devices may reflect, or affect, children's creativity, several concerns stand out. The first one relates to the somehow romantic idea of childhood being lost (Gray, 2013; Gardner and Davis, 2013; Turkle, 2015; Lanier, 2014; Cordes and Miller, 2009) because children today spend long hours on networked media devices. Some of the concerns expressed include that digital devices would replace other childhood activities (Cordes and Miller, 2009). This is especially pronounced for pre-schoolers. Nevertheless, the worries do not subside well into the teenage period where both the opportunities as well as the threats from engaging with digital devices, the Internet specifically, are put forward (Livingstone et al., 2011, 2014a). Julian Sefton-Green (2001) observes how, depending on the social contexts, engagement with new media can help or hinder children's creative potential. On the other hand, there are other factors that must be taken into consideration when such romantic notions seem to put pressure and thus steer decision-making among those on whom children depend. Parents may restrict digital media use to safeguard 'childhood' but there are so many more restrictions that have affected the opportunities for a child to play freely and independently – from legal constraints (Barkham, 2013) to school and extra curricular engagements that fill up most of a child's waking hours (Young-Eisendrath, 2009; Orr, 2017). In fact, research has further come to support the use of digital media devices for social connections – children often use networked technologies to stay in touch with friends when they cannot physically be together (Livingstone and Sefton-Green, 2016).

Another criticism relates to the idea that children today are a more copycat generation as a result of their engagement with digital media. Some of the arguments are that the app world seems to provide only a finite recombination of already existing elements. What may seem as creative initially may in fact be re-creative (Gardner and Davis, 2013; Lanier, 2014). Some studies further illustrate how children, exposed to rich audio-visual content, can restrict their ability to generate novel images of their own (Valkenburg and van der Voort, 1994). There are many software applications that allow the user to create things – from music and writing, to poetry and drawing. As Lawrence Lessig says, the code determines the creation (Lessig, 2000).

In particular, one study looked at the visual artistic expressions as well as short essays produced by students within a long period spanning from the 1990s to 2011. The findings demonstrated radical shift in creativity (Gardner and Davis, 2013). Specifically, visual arts had shifted from rule-based to more explorative and "breaking the rules" expressions, however, when it came to essay writing, the earlier cohorts showed more creativity and originality in story-telling including the use of language, whereas the later cohorts – those towards the new millennium – would stick to more conventional linear story-telling, with more colloquial, street-type language (Gardner and Davis, 2013). Within the span of twenty years young people have become more sophisticated visually than verbally. But again, the argument that modern-day children are less creative than previous generations is more speculative and generic than a proven fact. Moreover, while claims are made about the levels of originality and creativeness among the young, this thesis argues that their expression

by making things – in this case through the use of tablet applications – should be seen as the alternative method to, say, writing, or verbalising personal thought and perspectives, and perhaps even as an alternative to the prescribed ICT curriculum.

Howard Gardner further makes reference in his book to the interviews he has conducted with teachers, who say that, in their observations, students today struggle more with developing their own original ideas. They are more comfortable in playing around with available existing ones (Gardner and Davis, 2013). However, this only shows one side of the story – as Gardner clearly states, he has interviewed the teachers. Therefore, he shows evidence for the teachers' understanding of children's creativeness only. Children can and do resort to immediate, ready-made content of any kind, at a simple click on their digital media devices. This may affect processes of thinking, of making meaning and of arriving to novel ideas. However, in any social environment children can and do resort to immediate, ready-made content – from the school textbooks to the ready-made sentences when they interact with parents, peers and educators. Ultimately, the focus should be on how children select and reconstruct such 'easily' accessible material into their personal creations with their individual and personal meanings rather than simply judge a creation as 'copycat' or 'original'.

Having instant access to ready-made content and concrete images leads to another existing argument that digitally enhanced environments impact on important cognitive processes and from there – on creativity. Some studies have demonstrated the restrictive impact a complete picture or an example can have on children's ability to come up with their own ideas (Gardner and Davis, 2013). This resonates with the

"path-of-least-resistance" people tend to resort to when faced with generic tasks (Ward, 1994; Ward et al., 2002; Abraham, 2006). For example, when given a picture of an existing animal and then asking a participant to draw an animal from another planet, the generic features of the earthly animal posed restrictions onto the participant's ability to create a new animal. The visualisation hypothesis, which states that children's ability to generate novel ideas is restricted when they are exposed to ready-made visual images, is confirmed by a number of neurological studies (Abraham et al., 2006; Dietrich, 2007). This brings to mind Eysenck's theory of intelligence (1982), which posits that, we restrain ourselves to a heuristic search to a given circumscribed area (Eysenck, 1982). In this regard, another criticism has been that if digital media devices present a complete picture for children, it is hard to resist its boundaries and imagine their own. It becomes hard to overcome the fixedness and biases that concrete images can induce (Abraham et al., 2006). Therefore, some form of conformity is likely to be achieved. Here, one is pressed to ask, will digital media devices constrain one from generating new ideas? Furthermore, digital media devices empower users because they can offer them all kinds of tools and a rich choice of ready-made content. Will children's creativity be stifled if the path-of-least-resistance is not overcome due to the abundance of choice provided by rich audio-visual apps (Abraham et al., 2006)? But then again, is it more important that children demonstrate the need for self-expression by making things in general, or with digital media devices in the case of this thesis, than by assessing and measuring 'levels' of creativeness of what has been made? As David Gauntlett says, "a creative achievement means that someone not only *thinks* they are a distinctive individual, but has actually got something to show for it" (2007, p. 13). That is regardless of the limitations that digital media devices, or any other tools for that

matter, can pose on the individual who makes things as a means to self-expression, demonstration of ideas and perspectives or even as a gift (Gauntlett, 2015).

Jaron Lanier has lamented how "Online culture is dominated by trivial mashups of the culture that existed before the onset of mashups, and by fandom responding to the dwindling outposts of centralized mass media. It is a culture of reaction without action" (Lanier, 2010). Lanier describes this as the ultimate lock-in. Referring to MIDI – a music protocol which enables musicians to represent musical notes in a simple digital format. MIDI's representation of musical notes does not include the textures and specificities found in the tones of other instruments like string and wind instruments or even human voice. Lanier's argument here is that something of key importance is lost when one puts something like music, which is inherently infinite, into a finite set of combinations (Lanier, 2010, 2014).

On the one hand, digital devices should be platforms to unbound access to information. Their provision of instantaneity and automation of certain activities solves one problem – that of the limitations of the physical classroom – but may create another. Digital media devices have the potential to put constraints on creativity through their ability to automate (like Google search) precisely because they can disrupt, even eliminate, important cognitive processes preceding creative thought (Carr, 2015; Turkle, 2015). Nicholas Carr (2015), Sherry Turkle (2015), and Avril Loveless (2003), on separate occasions, argue that automation will degenerate many fine skills characteristic to humans, and, ultimately, creative thinking. Today, many concepts and phenomena come disguised behind friendly interfaces of software applications that give all the required effects without demanding for any

effort from its users. Software applications, in other words, "minimize the cognitive load they place on users" (Carr, 2015, p. 180). However, as instructionist theories purport (Moreno, 2004), unburdening the learner of cognitive load can facilitate learning. The same way, easing the cognitive load involved in production could equally be a factor that can enable creative flow.

Certain software applications provide positive and entertaining environment that accommodate various learning styles and minds (The Economist, 2017). On the other hand, one cannot become a virtuoso without the rote learning that can be deemed as rather uncreative or not particularly entertaining process (Lanier, 2014; Carr, 2011). Such arguments have enticed critics of software applications who would see digital tools entering the realm of education as "poorly constructed, consisting simply of a mishmash of images, sounds and video that offer little more than light entertainment" (Aldrich, Rogers and Scaife, 1998). Others argue that educational packages glittered with entertainment nuances are often no more than 'electronic books' that betray the material's origin – a crucial component to the digital media literacy skills (Buckingham, 2007).

Yet another criticism leans to the technologically deterministic view that users of networked digital media devices become rather reactive. Howard Gardner and Katie Davis maintain that people generate new ideas when they reflect on the surrounding world (2013). However, to enter a depth of contemplation that in today's overwhelming noise of incoming rich audio-visual media on the digital devices becomes a rare moment (Turkle, 2015; Gardner and Davis, 2013). Sherry Turkle thus observes: "Tutored by technology, we become reactive and transactional in our

exchanges because this is what technology makes easy" (2015, p. 319). Turkle further warns that, "at school and work, the app way of thinking can show up as a lack of creativity and innovation. Your options are laid out and you pick from the menu" (Turkle, 2015, p. 323). However, this suggests that one submissively accepts such logarithmic menus. When world chess champion Garry Kasparov lost to the IBM computer Deep Blue in 1997, weary feeling prevailed among the general public. When Kasparov played a match against the Bulgarian grandmaster Veselin Topalov, during which they were both allowed to consult a computer, Kasparov realised, "since we both had equal access to the same database, the advantage still came down to creating a new idea at some point" (Kasparov, 2010, p. 21). This is to say that digital devices exercise excellence in the domain they are built to. They cannot innovate, or be truly creative. Programs can produce prose, if programmed, yet, cannot decide what to write next (Brynjolfsson and McAfee, 2014). Coming up with new ideas, "ideation" (Brynjolfsson and McAfee, 2014, p. 191) depends on humans. Computers can ultimately generate and recombine from existing database of elements and information. However, humans reserve the ability to innovate in a truly meaningful way. More than that, in combination with intelligent machines and digital devices, just as Casparov and Topalov did during their game, can reap outstanding results (Brynjolfsson and McAfee, 2014). To avoid giving children the impression that apps guarantee a finite combination of answers and a logarithmic certainty, elements of collaboration, sharing and the concept of gift giving (Gauntlett, 2011, 2015) must exist along with children's passion to engage with digital devices.

Some social scientists have argued that engaging with various technologies can be subversive, chaotic and even dangerous (Sutton-Smith, 2001). Others have critiqued the use of digital devices by seeing it as "a heavy diet of ready-made computer images and programmed toys that appear to stunt imaginative thinking…children in our electronic society are becoming alarmingly deficient in generating their own images and ideas" (Cordes and Miller, 2009, p. 4).

In similar ways, Avril Loveless (2003) cautions that using digital tools for the sake of producing the things that they afford users to produce does not necessarily lead to creative output. Rather, it is a digital creation without any specific meaning. In support of this argument, the artist Terry Taylor warns: "It is the representation of meaning that is the key that elevates production to a position beyond the merely decorative…this takes time and a continuation of intention and cannot be achieved by ad hoc projects based on mechanical processes" (Banaji, Burn and Buckingham, 2010, p. 60). It is 'meaning' that makes all the difference in the creative process.

As much as digital devices let children explore all sorts of environments online that physically would have been impossible (say a construction site similar to Minecraft, or war zones similar to those depicted within some video games) the very lack of physicality during the production of anything on a digital platform may be limiting the scope of creativeness (Loveless, 2003, pg. 12). Scrimshaw (in Banaji, Buckingham and Burn, 2010) adds to this by arguing that the production of anything creative on digital platforms can lead to uniformity and lack of individualism and even meaning as the artist Terry Taylor has warned (Banaji, Buckingham and Burn, 2010, p. 60). Some software applications provide an opportunity for making

meaning (Loveless, 2003). This is to say that one must move beyond the digital skills required to manipulate, make use of and explore digital devices. The language used to express a meaning must go beyond the manipulated image, the video clip or the digital construction. Creative explorations on digital platforms cannot be solely "mechanical processes" (Loveless and Taylor, 2000, p. 65). Therefore, what meanings do children – the digital media users – input into their creative production? What emotions do they express during the creative process?

Looking at fostering creativity through the use of various technologies is not a newly studied issue (Clements, 1991; 1995; Loveless, 2003; 2010). Many of these studies draw details on the advantages and disadvantages from using specific software applications and digital media. They help build the same arguments of how to foster creative thought, creative use and creative production when children engage with today's digital tools. Past studies for example have shown how when children use software applications for drawing they show, in effect, improved drawing abilities and also more creative input overall, compared to their work on paper. The difference being that the software program allows for more elaborate exploration of the drawing tools than if it were to create a drawing by hand. Also, the ability to modify their ideas, the availability of "provisionality", mentioned earlier, as a feature of the software is another advantage (Loveless, 2003). And, ultimately, their digital creation is then transferred to paper again (Vaidya and McKeeby, 1984). Other studies have shown positive influence on creative thought, improved graphic compositions, originality and drawing skills when children engaged with programs such as Logo (Horton and Ryba, 1986; Clements and Gullo, 1984; Clements, 1986). Reviewing such past studies is done to demonstrate not so much the positive

outcomes of so many efforts that have been made to foster creativity in children when they engage with various digital media devices as much as to demonstrate that when feeling in control – what often happens when children engage with a digital tool – they have shown further expression of fantasy and imagination (Escobedo, 1992).

Some projects have been in place to encourage children to build their own creations in response to various stimuli that aimed to convey meanings about various phenomena. For example, the Glebe Project and the Access Project (Loveless, 2003), launched in several primary schools, involved a few visual artists and the use of various technologies including scanners, cameras and graphics software such as PaintShop Pro. The goal of these projects has not been the product itself – an image, a design garment or a poster for a film – but to demonstrate that children could acquire skills in the process of seeking to creatively express meanings that they were initially introduced through learning (Loveless and Taylor, 2000).

This example helps form an argument that making meaning comes part and parcel with a wider set of skills, beyond the mere mechanical acquisition of new media literacy. The interaction with other players in a video game provides the opportunity to socialize, try out and explore various characters and behaviours, which can lead to more creative production precisely because interactions with others and character building involves searching for and making sense of things – learning what things mean, then putting meaning into new formations. This example also demonstrates that putting meaning into new formations happens also when there is collaboration and communication. Projects that enable collaboration and communication

encourage creative explorations and even improve on the learning skills of children. For example, the Bristol Internet Project set up in 1998 aimed to enable children from two schools in two different communities in the city to collaborate from a distance (Loveless, 2003). The children used digital cameras and "paint" programs to construct various creative images for themselves then exchange communications with the children from the other school. The interaction allowed children to collaborate on the creations by exchanging meanings – what those images meant to the child who viewed it and what the photo meant according to the child artist. The aim of this project, as Loveless says, is on the "children's development of their imaginative ideas, the use of a variety of tools and media, and the opportunities for evaluation and critique with peers" (2003, pg. 15). This further shows that creative explorations, as Cziczentmihalyi argues, cannot exist in a vacuum (Csikszentmihalyi, 1997). There must be communication, collaboration – constant feedback and reaction to the external feedback – from the field, from the experts, from the audience, and from peers. This creates the argument that digital devices should not isolate children from their community, from experts and leaders within a domain the same way school should not necessarily deliver subjects in a disconnected way but rather demonstrate how they are all interlinked (Papert, 1994). In a sense, children should engage and interact with their environment as they get acquainted with the various subjects of study. Through such interactivity, one that can further be afforded by technologies, children can obtain meaning and, in response to it, engage in creative production. Jackie Marsh further highlights the importance of connectedness as a key element to a productive pedagogical model "that can facilitate social justice in schools in that they ensure learner agency, relevance and challenge" (Marsh, 2007, p. 274).

Likewise, 'platforms of creativity', such as events, spaces or tools – digital or physical – can encourage meaningful connections and foster creativity (Gauntlett, 2015). Neil Postman states: "It is meaning, not utterance, that makes mind unique" (Postman, 1993, pg. 112). In his effort to distinguish man from machine, Postman argues that meaning means "something more than the result of putting together symbols the denotations of which are commonly shared by at least two people…meaning also includes those things we call feelings, experiences, and sensations that do not have to be, and sometimes cannot be, put into symbols. They 'mean' nonetheless." As he concludes, "without concrete symbols, a computer is merely a pile of junk" (pg. 11).

Further arguments against technology's effects on creativity follow from other work that focuses on the consumption of rich audio-visual content, always-on interactivity and the growing habits of scanning, scrolling and skipping in order to catch on with the multitude of content pouring from a multitude of digital platforms (Rosenwald, 2014; Turkle, 2015; Carr, 2015). To read a child's story on a digital device, for example, is very often not always just text. The story comes to life with visual and sound effects. The complete colourful world technologies present to children today is tempting, requires little understanding – decoding of words – and little critique or analysis. An image presents concrete concepts that even the illiterate can translate (McLuhan, 1964).

A recent longitudinal research project looked at how creativity among Americans has changed over the period of twenty years, and recorded a decline in creativity,

particularly pronounced among children born post 1998 (Kim, 2011). Kim (2011) analysed normative data gathered from Torrance Tests for Creative Thinking (Torrance, 1980) that have been conducted on individuals, aged from kindergarten to 12th grade students and adults. While the normative data showed that creative thinking scores decreased specifically for sixth graders, the validity of such tests should be questioned in relation to their ability to evaluate an individual's creativity as a way for self-expression and as an everyday experience (Gauntlett, 2007). Moreover, the Torrance Test aims to measure divergent thinking (Baer, 2011) while cognitive neuroscience has shown that creative thought can come from any part of the cortex and does not begin from an isolated operation in the right hemisphere of the brain only (Dietrich, 2007).

2.10. CREATIVITY AND MEDIA LITERACY

The rhetoric on the creative potential of technology (Banaji and Burn, 2007) highlights the question about the relationship between users and tools, skills and innovation. More than that the rhetoric on the creative potential of technology brings to the fore the question of digital literacy and education: How children learn to use technologies is just as important as how children can benefit from technologies to foster their creativity and learning. Obtaining new skills and exploring one's creative potential via digital devices, of course, does not have to be a sequential occurrence. Children learn how to navigate through their tablets without reading manuals first. More importantly, the question of media literacy is widely debated (Potter, 2010;

Livingstone, 2008; Sefton-Green, 2009; Siraj-Blatchford, 2010). Looking at what literature says about media literacy can set the tone in the following examination of children's creative production when they engage with digital devices.

Take any national educational strategy documents in Malta and basic literacy – learning how to read and write – seems to have gradually expanded to encompass digital media literacy (Ministry for Education and Employment, 2014; Department of eLearning, 2015). Today, researchers, policy makers, parents, industry members, economists and so on, talk about the importance of bringing up digitally literate children as much as it is important that they know how to read and write. Some academics, however, have argued that such necessity has stemmed mainly from the pressure of industry (Buckingham and Willett, 2006). Digital media literacy is not only necessary; it is inevitable (Robins and Webster, 1999). In their *Times of the technoculture: From the information society to the virtual life*, Robins and Webster say that there is no going back, unless one wants to be forever branded as a caveman. This is to say that the question today has moved from whether and why adopt technology to *how* (Buckingham, 2007). With that in mind, the Maltese government has begun to build strategies that aim to deliver digital tablets into the classroom (Ministry of Education Malta, 2014). The aim would be to develop an information society that is necessitated by the knowledge economy (Department of eLearning, 2015).

In relation to this, the question of digital literacy, based on children's engagement with digital devices, cannot be examined in isolation. As research has demonstrated, young users appropriate technologies to fit their values and everyday lives

(Mediappro, 2006; Ito et al., 2009; Rideout, 2017). They explore and creatively appropriate their digital environments reshaping them, making new ones and giving new meanings in a playful, seemingly unstructured way. This makes it harder to distinguish between the use of such devices for pure learning or leisure, for creative explorations, for 'downtime', for play or for work.

Defining what constitutes media literacy, therefore, will frame the critical analysis of children's use of and relationship with digital devices. Also, the effort to clarify what constitutes media literacy will also shed light over the current accepted mode of use in an outside the classroom. Finally, how and what educators and parents pursue for their children as digital literacy is likely to determine what they would allow the children to use these digital tools for.

W. James Potter (2010) raises issues with regards to what digital media literacy, as a definition, should include. Specifically, Potter highlights the potential mass media can exert negative effects over its users and the importance of media literacy as protector against negative effects and equally the importance of media literacy to be developed. Media effects have been greatly debated and it has been suggested that the methods used have been insufficient and treat children as gullible and incompetent (Gauntlett, 1997a, 1998, 2005), rendering them generally insufficient in their claims and adequate with regards to their methods of enquiry, in their assuming superiority over audiences, and presenting children as gullible and incompetent.

Furthermore, the view of audiences actively engaging with and producing media challenges the traditional critical analysis of the media effects theories at the time

when TV was central to everyday life (Livingstone, 2008). However, the notion of media audiences seems to lack the capacity to encompass the rich and complex reality of people's engagement with digital media where the term 'user' is becoming the main subject of discourse, where the view shifts from literacy to skills, competence, or capability. New media literacy, as with print before, has come to suggest that people can participate and maintain a democratic society through freedom of expression, creativity and collaboration. This has led to the promotion of media literacy and skills as national initiatives.

According to Malta's national eLearning strategy, media literacy means: "Collaboration, communication, critical thinking, creativity, citizenship, and character education." This suggests that media literacy can be seen as both the ability to critique, evaluate and understand media messages and also to have the skills to produce, and contribute – creatively – to media through collaboration and generation of content. All of this is to say that digital skills and media literacy become part and parcel of the objective to foster creative production through the use of digital devices.

Digital media environments afford active participation – interaction and generation of new ideas for their users. The quality of some software applications allows users to be their own creators of knowledge (Gardner and Davis, 2013). The app world has come to support a wide variety of learning and understanding styles (Gardner, 2011). While the traditional form of education has always focused on two major forms of human intelligence – the linguistic and the logical-mathematical – the new media platforms today provide a wide spectrum of choices and tools to customise learning.

Digital media environments "Enhance these kinds of interactivity by explicitly emphasizing the user's response and active assistance in the formation of the media text itself and by developing particular tools to facilitate this" (Fornäs, et al., 2002, p. 23). This suggests that children's media literacy – or lack thereof – must be seen from the point of view of audiences being equally creators of media messages, not only consumers.

While some academics (Buckingham, 2007; Clements and Sarama, 2002; Loveless, 2006; Loveless and Williamson, 2013) and public media (Toyama, 2015; Weiss, 2011) discuss how new media platforms might change learning, little focus seems to be put on how seven- to ten-year-old children can be encouraged to make and create their own ideas with digital media devices. A number of arguments are being debated among researchers and scientists, including how various aspects and types of technologies will affect learning (Craft, 2002; The Economist, 2017; Buckingham, 2007; Burkhardt and Schoenfeld, 2003; Carr, 2015; Clements, 2002, 2003, and 2007; Cooper, 2005; Lieberman, Fisk and Biely, 2009); threats and opportunities children face when they engage online (Livingstone et al., 2014a); how digital devices may affect children's creativity (Gardner and Davis, 2013; Kim, 2011; Loveless, 2006); their communication skills (Turkle, 2016); cognitive and non-cognitive skills (Fiorini, 2009); their social and psychological and even physical wellbeing (Mccarrick and Xiaoming, 2007; Loveless and Williamson, 2013; Bevelier, Green, and Dye, 2010; Jackson et al., 2010). Within those broader debates, this thesis looks at what happens when a child, seven to ten years old, is handed a digital device and asked to utilise it to create something that fits his or her own drives and interests. School looks at how to improve learning with digital devices, but the structure of

lessons, the learning goals, the subject matter is still decided upon by educators and policy makers, leaving little room for the children to decide for themselves to express their own interests and perspectives.

Digital literacy, as with basic reading and writing literacy, is meant to encourage literate individuals to express their potentials to learn and be creative (Livingstone, 2008). Nevertheless, literacies tend to come hand in hand with policy-making and governance, which also implies regulations and limitations. The question remains as to what extent, then, digital media put fewer limitations and less governance on their users, and afford wider, freer, means for creative production. If education is about to impose compulsory upbringing of digitally literate children just as it has been with basic literacy, what is the guarantee and the method of bringing up literary societies, rather than technically literate (Williams, 1983)?

As Freire (1987) and Papert (1994) discuss the difference between literate and literacy creates the need to understand whether digital devices will encourage the first or just deliver the second. In Freire's words, reading the word and the world create a major difference between what the two are meant to achieve. On the one hand, reading the word may mean, as Gramsci explains literacy (in Freire, 1987), the means to perpetuating repression and domination. On the other hand, reading the world, naming the world, leads to empowerment, personal way of seeing the world – then expressing that individual viewpoint – and therefore becoming a model for changing the world (Freire, 1987). In a wider sense, Freire adds, "Literacy is analysed according to whether it serves to reproduce existing social formations or serves as a set of cultural practices that promotes democratic and emancipatory

change" (Freire, 1987, p. 141). This begs the question, whether digital devices and the World Wide Web in the hands of children would come to serve to reproduce existing social formations or they would empower their users to become critical, creative thinkers and emancipated change-makers.

Papert reasons that literacy and literate must come to differentiate the skills one acquires in possession: "…the words *literacy* and *literate* refer to the special skill involved in reading words made up of alphabetical letters. Outside this more narrow definition will remain the opportunities, offered for the most part by the new media represented symbolically by the Knowledge Machine, allowing students to become highly literate independent of their progress toward literacy" (Papert, 1993, p. 11).

The promotion of literacy may, at a first glance, seem like a promise for freedom of expression, learning and creativity (Livingstone, 2008). Opportunities, however, are often conditioned. As Jaron Lanier argues, the conditions today are expressed in the exchange of personal data, to a rather dangerous degree, for the seemingly empowering access to and possibilities from the use of digital media (Lanier, 2014). The point to make here is that while discussing the opportunities digital devices can afford to their users, it must be acknowledged that digital applications and platforms often come hand in hand with, often invisible, agendas.

2.11. REVIEW OF SOME THEORETICAL MODELS OF CREATIVITY

Reviewing literature on creativity in general and creative production through digital devices specifically helps to pose the question of whether it is more useful to look at creativity as an internal cognitive function or an external cultural phenomenon. Making such a distinction matters as it will help to understand what the implications such approach to creativity can have for the analysis of children's media literacy and learning in general when it comes to their engagement with digital devices. Next follows an outlook of some often quoted theoretical frameworks through which scientists have tried to explain creativity.

For some time, an influential model within the cognitive perspective to creativity has been that of Mednick according to whom the differences at the level of information processing can affect creative capacity (Mednick, 1962). Within a semantic network, various concepts are associated with one another in different degrees. The level of remoteness between associations represents the degree of creativity. This model, however, relates creativity to a special organization of associative memory, whereas research has shown greater explanation through the more effective way in which such contents are accessed (Benedek and Neubauer, 2013).

An improved variation of Mednick's model is the Geneplore model of creative cognition (Finke, Ward and Smith, 1992). It looks at the mental operations involved in creativity (Abraham et al., 2006; Fink et al., 2007). The notion here is that one begins building creatively or otherwise from already existing 'pre-inventive'

structures, like the formation of associations between stored memory and the logical transfer of information from one context to another. This is followed by exploration and interpretation of these ideas by, for example, looking at them from a different perspective (Fink et al., 2007).

In some cases within the discussion of the developmental appropriateness of various software applications children engage with (Clements and Nastasi, 1993; Clements, 1994), literature has shown that the issue of discovery-based applications that allow children ample time of free exploration, can often lead to boredom (Lemerise, 1993; Clements and Sarama, 2002). In support of such occasions, research within the field of cognitive psychology has demonstrated the importance active constraints can have on creative tasks (Costello and Keane, 2000; Finke, Ward and Smith, 1992; Moreau and Dahl, 2005; Smith, Ward and Finke, 1996). Putting constraints on certain inputs can lead to creative processing (Moreau and Dahl, 2005).

According to the Geneplore model there are two cognitive inputs involved in a creative task: Generative and exploratory. During the generative stage a person develops preliminary mental representations as the solution of the task in question by making groupings and combinations of the elements available to him (Finke, Ward and Smith, 1992). This so-called 'pre-inventive structure' then serves as the blueprint of what will become the final creative solution to the task at hand. If, however, the explorative process does not yield a desired result – a solution to the problem at hand – new knowledge base may be necessary to add in order to modify the explorative process again until a solution is generated. Cycling back and forth from the generative to exploratory processes is often present when a person is

dealing with solving a problem (Moreau and Dahl, 2005). How creative the solution will be then depends on the constraints or freedoms available to the person dealing with the problem. Where constraints are not imposed, a person can often recall an existing solution; he takes the path of least resistance (Ward, 1994; Barsalou, 1991; Park and Smith, 1989). Where constraints preclude the respondent from taking on the first solution that comes to mind, he or she is more likely to think of alternatives and reach a more creative solution. Active constraints such as input constraints and input requirements require more cognitive resources; they can also create uncertainties about finding possible solutions to the problem at hand.

More than a dozen models of creativity have been proposed for the past century (Plsek, 1997). Nearly all share common features. For instance, most models describe creativity as a set of phases through which an individual goes back and forth through analytical and synthetic thinking. The model developed by Graham Wallas for example, consists of four phases: Preparation – development of the problem; incubation – ignoring the problem for a period of time; insight – when the novel idea occurs; and verification – analysis of the novel idea (Neumann, 2007). The first and the last of the phases require analytical thinking, while the phases of insight and incubation – of synthetic thinking. Other common features in the various models proposed to explain creativity include the social and the cultural contexts that play a role (Runco, 2004; Vygotsky, 2004; Rhodes, 1987; Amabile, Goldfarb and Brackfield, 1990). Collaboration has also been positively linked to creative capacity in various models explaining creativity (John-Steiner, 2000), even when two characters seem to be the opposites of each other (Wolfshenk, 2014).

Neumann (2007), for example, examined the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany, which was considered to be highly creative organisation (ranked as the top non-US institution according to Science Watch, 2003). Neumann found that what made this organisation highly creative were common elements present in models of creativity as outlined previously in literature. For example, EMBL worked on missions of trans-national nature. They collaborated with scientists in various parts of the world. This meant that a rich combination of social, cultural and scientific backgrounds blended together over a work project. Secondly, EMBL was interdisciplinary in nature. People involved in projects had various backgrounds: Staff included physicists, chemists, engineers, mathematicians, molecular biologists, computer scientists and many more. Individuals from more than 60 nations worked together on temporary positions. This created a high turnover and a youthful research environment (Neumann, 2007). By examining both the individual and the collective dimension of creativity through a series of interviews with members of the organisation, Neumann identified several key traits that tied in strongly with the highly creative culture at EMBL. The most recurring features included the free-flowing hierarchy and a highly developed culture of interaction, which guaranteed scientists' exchange of ideas and inspiration. The freedom to try out new things, to exchange ideas on an interdisciplinary level, confirm that innovative ideas emerge when dynamic interactions between individuals and the system take place (Holland, 1998). The free-flowing interaction at the EMBL was what fostered creativity, supportive of the idea that individual components in a system must be able to interact freely and flexibly without central control (Holland, 1998).

2.12. ISSUES IDENTIFIED FROM THE LITERATURE REVIEW

The above review briefly captures the empirical work, the claims, and the theoretical propositions made with regards to the concept of creativity throughout a long span of time. As a result of this review several key elements – issues but also useful perspectives – come to the surface.

First, one does not need to adhere to a claim that creativity is a special quality possessed by the few. Specifically, children – the subject of this thesis – can be creative, regardless of their knowledge base and skillset in a particular domain. Children's curiosities, discoveries, experimentations and explorations – as accounts of creativeness – form part of their learning and cognitive development.

Second, the focus of the debate on creativity seems to fluctuate over the years. From what is considered creative, to who has it, from focus on the product to focus on the creative process, the debate also encompasses questions such as how creativity can be fostered. Therefore, this thesis concentrates on the notion that creativity is an essential trait to all individuals, including children and their need for self-expression. Creativity is also a process, which includes exploration and learning as the person involved in the creative making engages *with* and *in* their environment (Vygotsky, 1977; 1978).

Third, while developmental theories have defined the various aspects of the processes of creativity and learning, issues remain as to their validity and even

relevance when one can deem creativity as a facet to a person's way of self-expression and individualism (Gauntlett, 2007) and even potentials (Vygotsky, 1978). For example, to Piaget, learning is an act rather than a disposition, and so is creativity: One engages in a variety of processes, which can lead to creativity. However, Piaget's view of the cognitive development of a child in stages suggests that there is a cut off from one stage to the other (1973) which renders the child incapable or unqualified depending on the stages he or she is at. According to Piaget, the aptitude of a child in various domains depends on the skills, knowledge, and experience that child gains as he or she grows up (Piaget, 1972). Piaget therefore argues that one can foresee a difference in speed of development which depends not only on "the quality and frequency of intellectual stimulation received from adults or obtained from the possibilities available to children for spontaneous activity in their environment" (Piaget, 1972, p. 44) but also by the manner in which the formal structures of knowledge are used. While this highlights the importance of applying knowledge – of making and constructing – on the other hand, as underlined earlier, the rigidity of the developmental stages in which Piaget seems to imprison children and thus categorize their intelligence are marginalized by the fact that, first, this thesis does not look at the aptitudes or the level of intelligence but rather children's desire, agency and perspectives regardless of their age or 'stage', to express themselves by making things. Additionally, the aim here is not to confirm or deny whether such 'stages' exist but rather exhibit children's motivations to self-organise in a creative process and their motivations "to express, and in expressing to clarify, inner emotions and attitudes – their own and others' – in relation to the common materials of outer life" (Eldridge, 2003, p. 100). In other words, this is "the working through of feelings and ideas, and the way in which creative activity is *itself* where

the thinking through and the self-expression takes places, *as well as* being a process which creates an artefact which represents the outcome of those thinking and feeling processes" (Gauntlett, 2007, p. 28).

Fourth, the developmental theories look at society and the social setting as central in the process of children making meaning (Vygotsky, 1966) with differing views in terms of how such meaning is constructed, how much the environment – and media – can influence behaviour (Bandura, 1989) or the cognitive stages in which children enter as they grow up (Piaget, 1973). However, the current thesis aims not so much to describe – confirm or reject – what theories say about what happens as a child grows in a social setting but to question, even sidestep, the instruments with which such conclusions about children's development have been drawn (Gauntlett, 1997, 2008). Specifically, the type of research methods used to capture children's way of learning or making meaning about their surrounding world – how the processes of learning and creativity of children are quantified or qualified – can be limiting. That is, as any experiments may reveal *some* form of information about how a child learns or about a child's creativity (Gauntlett, 2007), they cannot reveal the whole truth and certainly will not acknowledge a process that happens in real, everyday situations, since experiments are usually done in artificially created environments and controlled conditions. Similarly, a survey or an interview may not best capture what these meanings are; expressing themselves verbally can be challenging or not necessarily the best method of research with children (Buckingham, 1993 in Gauntlett, 2007) and individuals in general.

Observing one's behaviour without clearly understanding the meaning ascribed to it according to the observed can lead to radical misunderstanding and wrong conclusions (Weber, 1978). One way to obtain a better understanding of children's motivations, perspectives and interests is by allowing them to engage creatively in making meaningful things, things that matter to them and as they see them (Gauntlett, 1997; 2007). For this reason, this thesis highlights the relevance and the value in using "creative and visual research methods [to] give people the opportunity to communicate different kinds of information" (Gauntlett, 2007; p. 182). Moreover,

> Pictures or objects enable us to present information, ideas or feelings simultaneously, without the material being forced into an order or a hierarchy. Language may be needed to explain the visuals, but the image remains primary and shows the relationships between parts most effectively. (Gauntlett, 2007, p. 183)

Instead of measuring creativity or identifying where it derives from or how it is relevant to the development of a child or learning, it must be seen as another form of self-expression and a process of self-organised exploration and learning whereby children engage in creative production be that by creating an imaginative story of their own, by making video games (Kafai, 2006) by making podcasts on various topics of their own interest (Cebeci and Tekdal, 2006), or by making video features related to a particular concern (Gauntlett, 1997). Stemming from visual sociology, such methods related to engaging youths in expressing themselves visually by making a film or taking photographs or drawing and so on are not new (Larson,

1999; Chalfen, 1981; Rich and Chalfen, 1999; Pink 2001). Using this kind of "enabling methodology" (Gauntlett and Holswarth, 2006, p. 84)

> …assumes that people have something interesting to communicate, and that they can do so creatively. That means it's basically the opposite of the experiments into 'media effects', where researchers seemed to assume that people had very little self-knowledge, and indeed would not be clever enough to work out the point of the psychology experiment in which they were trapped. (Ibid.)

Such methodology can enable children's self-expression but it also steers them to discovery and self-organised learning by making.

Fifth, moving to more recent debates as outlined in the literature review, questions have arisen as to the degree digital media devices might challenge the individual to resist its ready-made applications and frameworks (Cordes and Miller, 2000). Specifically, how ready-made products and applications will affect children's creative thought. For instance, Cordes and Miller (2000) argue that "a heavy diet of ready-made computer images and programmed toys appear to stunt imaginative thinking" (p. 4).

Children make use of and draw ideas from their engagement with digital devices and their derivatives such as software applications, the Internet as a source of content and exposition of others' creations. Children re-use such seemingly easy to obtain,

available material to produce or reproduce their own combinations. Such activities raise the questions as to the originality of such reproduction, resonating with criticism related to the social-cognitive view of learning that mimicking an observed behaviour may not necessarily account for the acquisition of novel behaviour" (Gredler, 2010, p. 351). Relatedly, Sefton-Green (2006) has argued that building skills in creative media production demonstrate how the software can influence the production process itself. On the other hand, lumping all technologies together, as critics have highlighted, prevents one to see the possibilities for specific digital tools within specific contexts when creativity and creative expression can thrive (Resnick, 2006). The same way, those in support of social-cognitive theory have stressed that while behaviour may be mimicked, children can equally demonstrate novel responses, adding their own personal combinations and unique details (Bandura, Ross and Ross, 1963). Therefore, the focus of this thesis is cast not so much on the processes or the outcomes but on the efforts of fostering and encouraging creative exploration, experimentation and production as a personal way of expression of thoughts, perspectives and equally agency over the tools at hand. The reason behind taking such stance is not to disqualify the importance of the very process of creativity or to render all products of creative work of equal value and quality but to highlight the more pressing matter of encouraging and nurturing children's desire for making and creating (Papert, 1994; Resnick, 2017).

Sixth, as recent arguments have surfaced from literature review, children play video games, successfully search and watch various content on the Internet, connect with others, send and receive, download and upload content, inhabit digital worlds, yet many of them do not go up the 'ladder of opportunities' (Livingstone and Helsper,

2007). The interviewed children in this thesis, too, demonstrated familiarity with their digital tablets and smartphones, but they have also shown that little do they make with them. In this respect, Livingstone and Haddon have suggested that while there is a 'ladder of online opportunities' (2009) where, as children acquire digital skills, they move up a rung, they also often stop 'climbing up' that ladder by staying where they feel comfortable with what they know. Then, to what extent do children gain a good grasp of their skills and do these suffice for them to make things through the use of digital media devices? As Livingstone and Helsper have explored the skills children learn online (2007), this thesis has extended this enquiry from identifying how children engage with digital media devices to what children make with them; whether they go beyond the mere consumption of content to create meaningful things; if not, how such culture of creators can be fostered. Compared to more conventional media tools and any elements that allow young people to tinker with and be creative – from paper and colouring pens to playdough, Lego blocks, clay, or even writing, dancing, and so on – do children engage in creative production when they use digital devices? Can one claim that digital tablets foster creators and makers or do they rather create "the ultimate lock-in" as Gardner and Davis ask (2013, p. 143)?

2.13. CONCLUSION

There seems to be a lack of unified understanding with regards to children's creativity and creative production through digital media devices. There is a lack of

literature voicing seven- to-ten-year-old children's views and experiences in the debate about creativity through digital media. There is a lack of literature on children's own voices and experiences with regards to what school does with digital media tools and how that reflects children's engagements with these tools outside school. Moreover, research has pointed to the necessity for curriculum to move "beyond the promotion of an arts-based curriculum, important though that is, to include a greater focus on children's own cultural interests and activities" (Marsh, 2010 p. 54), as a 'child-centred' approach to education. Seven- to ten-year-old children's creative production through digital media have not been outlined in literature even though research exists regarding the types of activities they engage in, evaluating them as creative (Marsh et al., 2015; Loveless, 2003) or not creative (Cordes and Miller, 2009). While there may be arguments against voicing out the opinions of seven- to ten-year-old children who may not be as experienced or even well versed compared to a normal adult it is important to highlight their relatively quick and easy take on digital devices that is the very reason so many contemporary debates surround children's use of these and the way schools adopt them in comparison (Loveless, 2010; Suárez-Guerrero and Lloret-Catalá, 2016). Moreover, because children may not necessarily be eloquent and expressive in verbalising well their thoughts and ideas, this does not put them under the label of incompetent or inexperienced. Rather, there are different, more objective and successful ways (Gauntlett, 1997; 2007) in which their perspectives can be obtained that can serve not only as valuable knowledge about the children themselves but also as a way of encouraging better learning.

There have been various attempts to study creativity with regards to education and in relation to larger efforts, specifically in schools, to foster children's creativity (Loveless, 2002). In Malta, too, the national educational policy recognises the importance of teaching creativity skills alongside critical thinking, collaboration, and communication (Ministry for Education and Employment, 2014). While such efforts seem to assume that children's creativity may not be there, or is diminishing, the effort in this research has been to, rather, make room and create conditions and opportunities for children to express themselves creatively, navigate their regular use of digital devices for more creative production, and ultimately foster independency. Along with such efforts to foster creativity as key skill in the digital age (Ministry of Education and Employment, 2014) the issue of digital media literacy and even the necessity (Jenkins et al., 2009) to teach children such digital media skills has been widely discussed (Livingstone and Blum-Ross, 2017; Potter, 2010). Such discussions are necessary. Research on the threats and opportunities from networked digital media (Livingstone et al., 2014a) are also invaluable in order to draft policies that can protect children while at the same time give them freedoms to benefit from these tools. Nevertheless, such discussions must be made with clarity and objectivity, not put children in the role of gullible victims who do not understand. Instead of working backwards by assuming that children do not possess particular skills or knowledge, or would not understand certain things in certain periods of their lives, an attempt should be made where self-organised learning is encouraged, in the safe environment of the classroom, by encouraging children to engage in creative production with the digital devices that are now becoming part and parcel of the educational tools.

The interviewed children in this thesis come from mainstream primary education. According to them and the interviewed principals and teachers, the interviewed children take little or no responsibility or say in the educational design and in how digital devices could be used in class, where these were already being used. Children's participation in the construction of what teaching should be practiced on them and what learning should be expected of them is important, even necessary. Their perspectives should be acknowledged as their human rights for improvements in education, for maintaining a democratic environment, for improving on their self-esteem, independence and making decisions (Lansdown, 2001; Davies and Kirkpatrick, 2000; Cox et al., 2011). In one case, where children were on their school council, in the aftermath of the experimental design conducted there, as part of this thesis, one of the participants said this:

> We're on the school council, Miss, I'm going to propose this as a lesson next time we have the meeting. I just wish this never finished. Why can't you come for longer, Miss? (Boy, nine, government school)

Being aware of his active role in the decision-making process in his school, the participant made a value judgement and took a decision with regards to the workshop he had just taken part in. However, such thinking was not met elsewhere. Not all schools that took part in this research included children into their decision-making processes.

As Seymour Papert laments, “School continues to impose a single way of knowing on everyone” (Papert, 1993, p. 6). As it is currently evident, now that computers and tablets are present in primary schools, ICT subjects have (in some places) become part of the rigid curriculum expressed in an hour a week of study lessons, culminating with an end-of-term assessment. The five ICT teachers who were interviewed for this thesis confirmed this way of learning in their classrooms. This is to say that, instead of taking on the opportunities afforded by the various manifestations of digital devices and allow personal explorations and creative production, digital devices are now finding their way into subjects with allotted time, limited by rules and boundaries, based on what the teacher decides is educational and what is not. Digital devices should present alternatives to learning, where such opportunities can be adapted through an “epistemological pluralism” (Papert, 1993, p. 6). To this argument, digital devices should come to support a break-away, gradual or less so, from the traditional organizational structure still prevalent in the classroom – one teacher versus a class-full of quietly sitting children – as a first step to such epistemological pluralism.

Studies have shown how creative production – making media – have successfully taught children media literacy (Singer and Singer, 1998; Singer, Zuckerman and Singer, 1980). For example, while children were taught how to examine stories or television programs they were also taught how to produce similar content. Many aspects of digital media devices offer production and creation of multimodal content (Willett, Robinson and Marsh, 2009). These aspects of digital devices offer opportunities to children to be their own producers of creative projects and ideas (Jenkins et al., 2009; Marsh, 2010; Gauntlett, 2007). This suggests that creativity

through digital devices should go hand in hand with digital media literacy. School should design methods for ‘intervention’ by making room for creative development.

In fact, the way school imposes how digital media devices should be used and for what purposes that so far seems to leave no room for children to express themselves creatively with such tools reflects Paolo Freire’s critical perspective of learning, who argues that creativity, as a form of subjectivity, can be repressed in school, since curriculum does not leave room for subjectivity, rather, children follow the program since programs are tied to assessments, assessments condition the move to an upper grade, and so on (Freire and Macedo, 1987). In Freire’s words:

> Creativity needs to be stimulated, not only at the level of students’ individuality, but also at the level of their individuality in a social context. Instead of suffocating this curious impetus, educators should stimulate risk taking, without which there is no creativity. Instead of reinforcing the purely mechanical repetitions of phrases and lists, educators should stimulate students to doubt. (Freire and Macedo, 1987, p. 57)

Digital media devices can be used in a rather creative method that encourages self-discovery through creative production of meaningful projects and ideas and thus break the army-type of organizational structure in the classroom. Vygotsky further highlights the importance of the type of method used in understanding human activity:

> The search for method becomes one of the most important problems of the entire enterprise of understanding the uniquely human forms of psychological activity. In this case the method is simultaneously prerequisite and product, the tool and result of the study. (Vygotsky, 1978, p. 65, in Daniels, 2001)

CHAPTER 3

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1. INTRODUCTION

After reviewing literature on creativity it has become clear that there are various ways to look at the concept of creativity specifically in relation to how children develop, play, learn and interact with digital media. Some scholars have looked at ways to measure creativity (neurologically and psychometrically), others - to identify it as a personality trait, or a gift that just very few individuals have it. Yet others have looked at the possible limitations, specifically with regards to some software applications, that can negatively affect creative thought. This thesis, however, has rested on the belief that creativity is integral to all human beings, that creativity is the "external proof of our own personal vitality" (Gauntlett, 2007, p. 18). This thesis also identifies the need to develop means to foster such everyday ubiquitous

creativity and enable creative production for children in or outside school in relation to the long hours they spend engaging with digital media devices daily (Livingstone, 2014). Additionally, this thesis has focused on children's perspectives of digital media use and what motivates them to engage in creative production when they use digital media devices. In this effort three theoretical perspectives have been taken into account to define the framework within which the question of how to foster creativity and creative production has been investigated.

3.2. THEORETICAL FRAMEWORK

This thesis focused on the effort to understand what the implications of three theoretical approaches to learning – the developmental, sociocultural and critical – can be for the analysis of the meanings, experiences and creativity of children in their engagement with digital media devices, because such engagement would also have larger implications to how the same digital devices are now being used in primary schools in Malta (Digital Malta, 2016). From the first theoretical approach - the constructionist (Papert, 1993), developed from constructivism (Piaget, 1964, 1973, 1980) – it can be induced that children learn by constructing and making. That is, by self-organising, in the face of a given task, problem, or subject to (dis) cover (in or outside school), with the support of digital media devices, children can engage in creative production and learn in a self-directed, interdisciplinary manner. Thus, the constructionist's view can well support the main goal of this thesis. This first theoretical perspective also fits the goals of this thesis because it puts emphasis on

the psychology of self. That is, children at the age examined here, seem to begin to conform to rules and orders – a factor that has been linked to a slump in creativity (Runco, 2004). Conforming to rules and its possible negative effects on creativity further makes an emphasis on the importance of making a distinction between performance goals and learning goals and how much weight children put on each (Tan, 2008). As defined by the various models of creativity, such 'hurdles' as conformity, giving more importance to performance goals, less freedom to interact with others, inability to take charge of one's own interests or motivations in a playful manner and the imposition of rigid instruction of information, have served this thesis as key elements to control for – by avoiding them – in the aim to develop a model to encourage creative production with digital media.

However, while the constructionist view to learning seems to enable some form of non-interventional processes, which can be limiting in that they create a dependency on the development structures of a child (Vygotsky, 1978), a second theoretical perspective is respected for the purpose of this thesis's main goal that is the sociocultural perspective. The sociocultural view here is acknowledged because it puts importance on the role of mediation – the external to the developing child factors that can influence his or her development (Vygotsky, 1978). Furthermore, the sociocultural perspective sheds light over the child's agency, personal perspectives and experiences and how those can be mapped onto the existing curriculum that now involves digital media devices and the apps embedded in them. Moreover, the sociocultural perspective puts an emphasis on children's potential, suggesting that the constructionist view looks at what children can do now which is not the same as looking at what they are capable of doing *more* - that development is an outcome

rather than a prerequisite to learning experiences (Kozulin et al., 2003). A current 'state' of ability is demonstrated when the child's construction is undisturbed, unguided. Whereas mediation – be that through scaffolding (Wood, 1999), apprenticeship (Rogoff, 1990), mediated learning experience (Feuerstein, 1990; Leng Chua, Tan and Chng, 2017) can emphasise the greater potentials a child can have (Vygotsky, 1978). A child can demonstrate a potential for much more than the original 'level' of development a constructivist view may have positioned him at. Therefore,

> …what we call the Zone of Proximal development…is the distance between the actual developmental level determined by individual problem solving and the level of development as determined through problem solving under guidance or in collaboration with more capable peers. (Vygotsky, 1978, p. 86)

Thus, while a developmental approach may explain children's current abilities and knowledge as they demonstrate what they currently can creatively make through digital media, the greater goal should be on fostering their untapped, greater potentials.

The third theoretical guidepost underpinning this research is the critical view to pedagogy. A constructionist model sees learning as an intellectual process "through a series of fixed, value-free and universal stages of development" (Freire and Macedo, 1987, p. 142) omitting to acknowledge the 'emancipatory' view that:

> For literacy to become meaningful it has to be situated within a theory of cultural production and viewed as an integral part of the way in which people produce, transform, and reproduce meaning. (Freire and Macedo, 1987, p. 142)

Essentially, while both developmental and critical perspectives view learning "as an interaction (or dialectic) between mind and reality (or between inner and outer orientations), their outcomes are very different." (Walmsley, 1981, p. 78 in Freire and Macedo, p. 142) In the case of the developmental perspective, the model stresses "on the effects of the interaction on the mental structures of the individual…the outcome of the interaction is essentially viewed in terms of inner or mind growth. In contrast, Freire's emancipatory ideology stresses the effects of the interaction on both the individual and the social and political structures of the society…the outcome of the interaction is viewed in terms of both inner (mind) and outer (reality) growth or change" (p. 78). The introduction of these ideological views to learning in the effort to shape the theoretical framework for the current research may face opposition in light of the fact that this research looks at children, aged seven to ten. Such introduction is nevertheless done with the aim to highlight the importance of acknowledging "children's cultural capital and thereby lessening the potential for symbolic violence to occur" (Marsh, 2010, p. 45) – that is "the consequence of a dominant class imposing its own cultural values and interests on a dominated group, who then accept this situation without question" (p. 45). Similarly, Freire's view of literacy goes beyond the mechanical acquisition of skills to propose ways for the oppressed to emerge from a "culture of silence" and transform their relationship with the oppressor. Although these general descriptions of "oppressor" and "oppressed"

do not fit within the current democratic context of Malta, literature has demonstrated how a dominant culture that of the school curriculum can command its cultural values on its children (Livingstone and Sefton-Green, 2016), which may ultimately impose limitations to how freely children, seven to ten, can engage in creative making with digital media tools in class.

The use of Freire's critical view to education is relevant for at least two reasons. First, an analogy can be made from the strong critique on media 'effects' studies (Gauntlett, 1997, 1998b, 2007) with how the mainstream curriculum tends to approach the use of digital media devices in the classroom currently as seen from the observations and research conducted for this thesis and as observed elsewhere (Resnick, 2017). Media 'effects' studies for example, as David Gauntlett has critically pointed out (1998a, 1998b, 2007), have left a legacy of research that seems to have carved a lasting ideology that has persistently portrayed children as passive consumers of media messages and "empty or wrongly-filled vessels" (Gauntlett, 1998b, p. 2) waiting to be filled with logic and knowledge only after they have fulfilled orderly stages of development (Piaget, 1964). But such studies, as Gauntlett rightfully questions (Gauntlett, 2005), are misleading with the artificiality of the methodologies many of them apply, with the presentation of its subjects as incapable victims, and assuming "superiority" (Gauntlett, 1998a, par. 22) towards various groups of people, especially children, among other inconsistencies that media effects studies have left as enduring beliefs. In a similar way, primary schools in Malta seem to impose an out-dated way of delivering its curriculum to children – now by using digital tablets – as though the children were the same empty vessels with no opinion, agency, or perspectives, who would be lost without instruction, intervention, or

direction. Sociocultural theory emphasizes that pedagogy should reflect on the processes of teaching and learning as more than instruction and transmission of prescribed knowledge or skills (Daniels, 2001). Thus for example, children in Maltese primary schools would practice maths, religion, Maltese and English, albeit by using apps that provide audio-visual element unlike the printed study books, as they follow the curriculum and instructions of the teacher who designs the lesson. While this does not have to be necessarily all bad, the digital tablets and the way children engage with these outside school clash with how teachers insist on delivering information and knowledge to the children. Meanwhile, children have shown that they learn with digital media devices even with minimal external intervention (Mitra, 2003). Children make and create things with digital devices, without prior instruction or even imposition by an educator (Resnick, 2017). The way David Gauntlett argues that media 'effects' studies tend to tackle the problem of effects backwards "by starting with the media and then trying to lasso connections from there on to social beings, rather than the other way around" (Gauntlett, 1998a, par. 3), school, too, should start with children at the centre and make room for them to demonstrate their own perspectives. Therefore, there has to be a dose of critical view towards how schools assimilate the new technologies (Papert, 1993) while for the purpose of this research, the method to use should allow emancipatory learning to occur. Specifically, constructionist and sociocultural approaches expressed through the interaction between users of digital media and the social setting – interaction with others, or problems and tasks at hand. During such interaction then it greatly matters that the child, (1) is allowed to express themselves; that (2) such expression includes activities that are not only proposed by the dominant culture of school but to also include the learner's own propositions; that (3) there is room for

children to critically evaluate such propositions. As children seem to be "rarely able to engage in thorough critical reflection, regarding their own practical experience and the ends that motivate them in order, in the end, to organise the findings and thus replace mere opinion about facts with an increasingly rigorous understanding of their significance" (Freire and Macedo, 1987, p. 148), this thesis highlights the importance to critically view pedagogy in light of school's current, rather limited, incorporation of digital media devices into the daily classroom setting. The emphasis should be that literacy is not tied to the mechanical use of the available tools but must also include a critical understanding that children reconstruct their own culture and meanings of the surrounding reality they engage with.

Second, Freire's critical view on education is brought into this thesis because the implications of digital media use in the classroom are on learning. Claims that children today learn differently (Prensky, 2012) should not limit the view of learning as mere development of technical and literacy skills. That is:

> …Literacy cannot be viewed as simply the development of skills aimed at acquiring the dominant standard language. This view sustains a notion of ideology that systematically negates rather than makes meaningful the cultural experiences of the subordinate linguistic groups who are, by and large, the objects of its policies. For the notion of literacy to become meaningful it has to be situated within a theory of cultural production and viewed as an integral part of the way in which people produce, transform, and reproduce meaning. Literacy must be seen as a

> medium that constitutes and affirms the historical and existential moments of lived experience that produce a subordinate or a lived culture. (Freire and Macedo, 1987, p. 142)

In the context of this thesis "the subordinate linguistic groups" from this quote refers to the children who are the objects of educational policies and decisions that define how, when, and why they will use digital devices in their classrooms. This emphasises the importance of giving children the opportunities to express themselves through creative production and as they see the surrounding reality, basing their views on their own culture, language, experiences, and individual ways of finding solutions. On the other hand, this is not to say that children must be left to their own devices. The importance of structure and instruction must be considered.

3.3. RESEARCH SAMPLE

The age of the children researched in this thesis was from seven to ten years old. Nine eleven-year-old children also took part in the interviews. A brief explanation of the main reasons for choosing this age group follows. Sample selection has been crucial in this research in order to obtain participants from all socio-economic backgrounds in Malta. This has been done purposefully first, to examine the current digital media use of children aged seven to ten across the various socio-economic groups in the country, thus identifying any digital media gaps that might exist among

them. Second, the national policy to introduce digital tablets to primary education includes all schools – government, church and private – across the Maltese islands (Digital Malta, 2016). Therefore, the objective of this thesis – to develop a model to foster creativity through the use of digital media devices, which can have larger implications to the curriculum – had to include sample from each of the three types of schools.

The reason this age group – seven to ten years old – has been chosen is two-fold. First, children at that age have just acquired basic literacy and numeracy skills. Their primary education will soon adopt digital media devices as the main tool to use in the classroom (Digital Malta, 2016). Digital media devices, such as tablets, placed in the hands of children during school hours will undoubtedly create great challenges, as well as opportunities, to learning in general and creative activities specifically in the classroom. Second, children in this age bracket have only just started to develop and integrate various learning properties (Piaget, 2008, reprint of 1972). Furthermore, the children at this age already interact with various digital media on a daily basis (Livingstone et al., 2011, 2014b) have expressed a wide range of skills, interests and knowledge in relation to various networked media (Ito, 2017). Thus, the objective of this research is to foster creativity through the use of digital media devices in relation to the school setting but not excluding the importance of how children appropriate and engage with digital media tools outside it.

While the ideal in quantitative research is to use probability sampling where each member of a population has an equal chance of being selected in the sample (Jensen, 2012), this thesis's first research phase – to identify the daily activities children

engage in with their digital media devices in and outside school – is explorative in nature. Strict representation of the whole population of children aged seven to ten is not an abiding requirement. On the other hand, the Maltese population, geography and infrastructure allows for the access to a significant proportional representation of the population under investigation for this research.

There are 61 government, 28 church, and 13 independent/private primary schools on the Maltese islands (Government of Malta). They all follow the curriculum as outlined by the Maltese national literacy strategy (Ministry for Education and Employment, 2014). However, they mainly differ in the degrees of methods of teaching, in the mixture of gender and in the socio-economic backgrounds of the children that attend each type of school. For example, primary church schools are mainly single-gender schools. The children come from mixed socio-economic backgrounds. The teaching of religion is pronounced – at least two lessons a week (also prayers before and after lessons, lunch breaks and play time) – unlike in private schools, which are also mixed gender.

Government schools have mainly children from less affluent backgrounds. Children are taught in the Maltese language, unlike in church and independent schools where the primary language is mainly English. Government schools are also single gender, like church schools. Some allow mixed gender in the classrooms. Private schools have the biggest mixture of international, non-Maltese children. Private school children come from more affluent backgrounds since government and church schools are free, while private tuition requires the payment of fees.

3.4. TWO-STAGE SELECTION OF SAMPLE

This thesis involved three phases of research. A stratified probability sample in a two-stage selection was obtained for the first two phases. First, this was done so that preliminary quantitative investigation could be carried out with the children's parents, as part of the first phase of research. And secondly, the selection of schools from each type – church, independent/private, and government – facilitated the selection of a sample of children for personal interviews and focus groups that were considered for the second phase of research. A smaller number of the interviewed children were then selected to participate in the experimental third phase of this thesis.

The distribution of the sample according to schools was not strictly proportionate to the number of government, church and independent/private schools that operate in the country. However, a representative school from each type took part in the study, which suffices to say that children from all socio-economic backgrounds participated in this research.

Schools were initially randomly selected from each type of school – church, government and private. Of those who responded to the request to conduct research on their premises included four church schools, three government schools and three independent/private schools. From the schools that accepted to take part in the research – during the second stage of selection – school headmasters were asked to choose classes with students, aged seven, eight, nine, ten and nine children aged

eleven. The class selection helped for the distribution of a survey questionnaire consisting of 20 questions for the children's parents to reply (more details on the research method follow in section 3.6.).

Children from each selected class were randomly selected for the personal and focus group interviews. A total of 342 children were interviewed, personally or in focus groups. The interviews were conducted in the children's schools, during lessons, in time agreed with their teachers, parents and principals. The interviews were audio-recorded. The audio recordings were then transcribed verbatim. This means that any grammatical inconsistencies, colloquialism, incomplete sentences, and/or the use of Maltese words (with corresponding English translation next to the Maltese words made by the researcher of this thesis) were typed as said by the interviewees and recorded during the interview or focus group sessions.

3.5. SAMPLE SELECTION OF PARENTS, PRINCIPALS AND EDUCATORS

The sample of the children selected as per the procedure described above gained access to their parents. A survey questionnaire consisting of 20 questions aimed to gather parents' views and knowledge of their children's use of digital media devices. The questionnaire was distributed through the children selected for interviews and focus groups, specifically those whose parents consented that their children could be interviewed. A total of 309 parents returned a complete survey questionnaire (out of 342 – a high response rate). In one government school three classes of children were

interviewed (groups of 6 to 8 children for 45 minutes up to an hour discussions), however their parents did not complete the surveys. As the end-of-year term approached, the time constraints and the priorities surrounding that were the reasons for the principal to opt out of the demanding task to chase, via the teachers and the children, for the parents to complete and return the questionnaires. As a result of that the final number of completed questionnaires did not correspond to the number of interviewed children.

Personal interviews with 48 parents were also completed in addition to the completed surveys. Personal interviews with eight teachers – five, teaching ICT subjects at the participant schools and three teachers, teaching general subjects. Four school principals were also interviewed to understand their attitude towards children's engagement with digital devices, their perspective of children, media and creativity in general, and also their personal methods of fostering children's creativity and learning.

3.6. Research method

3.6.1. Research instruments for phases 1 and 2

The research method for this thesis mirrored its research questions, which aimed to identify a model that can foster children's creativity through the use of digital devices using constructionist, sociocultural and critical pedagogical approaches to creativity and learning. Questions (1) to (12) outlined in Chapter 1 precede the main research question of this thesis, which aimed to develop a model to foster children's creativity through the use of digital devices. Questions (1) to (12) aimed to obtain information that could help to paint a more detailed picture of the context in which the examined Maltese children engaged with digital media at the time this research was conducted. These questions investigated children's everyday practices and creative production with digital tablets, their favourite activities – games, apps or making things using any tools embedded in the tablets, their knowledge of and experience with these tools in and outside school. These questions also aimed to support an investigation on children's viewpoints and perspectives on what creativity meant to them, when they engaged in creative production with such tools – what projects, products or ideas they have made in the past. Similar questions addressed parents and teachers involved in the interviewed children's lives. These questions aimed to obtain information about parents' and teachers' perspectives in relation to the interviewed children's use of digital devices specifically for creating their own

ideas and making things. Questions from point 1.4.2 to 1.4.4 in Chapter 1 addressed phases 1 and 2 of this research. Questions for phase 3 were presented in point 1.4.1.

The research questions of this thesis required a multi-dimensional method to gathering data. Questions (1) to (12) relating to the breadth and depth of use of digital devices from the children's, the parents', and the teachers' perspectives, required the use of both quantitative and qualitative data. Surveys obtained information about parents' knowledge of their children's use of digital media devices. A survey questionnaire of 20 questions was developed, based on previous research (Marsh et al., 2015) to fit this thesis's questions. The questionnaire was pre-tested and then distributed among the parents of the children. Forty-eight of the surveyed parents were also personally interviewed. Personal interviews were also conducted with some of the children's classroom teachers and school principals in order to understand their attitudes of and knowledge about the children's experience with digital media devices and the overall feelings, thoughts and experience with digital media devices in the classroom (where four out of the ten participant schools already used digital tablets).

Personal interviews and focus groups were conducted with the selected children. Open-ended and semi-structured questions aimed to understand what they considered as creative production and creativity in general, how they appropriated digital tablets, the types of apps they used, the types of activities they engaged in and the types of projects they made using such tools, what they did on a daily basis both at home and at school. The focus groups and interviews were conducted over the span of one year. The researcher of this thesis met with the children – sometimes in

groups of four to six, sometimes as a whole class of 20 or 25 students, and many of them individually – at least twice, in some occasions more than that. On the first encounter, the children were introduced to the objective of the research, the type of discussions that would take place, and the type of questions that they were going to be asked. On the second meeting, more discussions followed, related to the research questions. Overall, the second meetings always proved much livelier in that the children felt more confident to speak and gave detailed examples and opinions. They also showed that they had thought about their answers after the first, introductory encounter. The information collected from these interviews helped in the effort to design a method, which could encourage creative production with digital tablets that could go beyond what children said they currently did with these tools. Obtaining children's point of view – what they understood by daily use and engagement with digital media devices and what they liked and loved doing on a daily basis at home and at school – mattered greatly in that this information was used to juxtapose with the answers collected from the young respondents' parents, teachers, and school principals. All views expressed did not always coincide. Further detail regarding this follows in the chapters on findings.

A clear distinction had to be made between doing research *about* children and doing research *with* them. On the one hand, research can be about children and the methodologies can involve conducting research with all stakeholders involved in a child's life. The child remains a passive object at the centre of the research. On the other hand, children can take an active part in the research process. They can express their view of what they (creatively or not) do with or through the use of their digital devices. Some innovative methodologies prove their effectiveness when children get

directly involved creatively into the research process (Barbovschi, Green and Vandoninck, 2013). Their active participation was, therefore, the main approach to research here.

According to the United Nations Convention on the Rights of the Child (United Nations, 1989) and General Comment No. 12 (United Nations, 2009) children must be included in issues that concern their wellbeing. "Children help to shape society: Their contributions cannot be unravelled until they are studied as individuals and not merely as members of the procession through childhood" (Reynolds, 1990, p. 330). In that respect, children's actual participation can take two forms. In one instance, they can present their own account of events related to the research at hand. In another, they can contribute with their input, impact on the research and, therefore, bring change to the final outcome (Boyden and Ennewy, 1997).

3.6.2. PARENTS' PERSPECTIVE TO CHILDREN'S DIGITAL MEDIA USE

Parents' view of their children's engagement with digital devices matters greatly in that past research has revealed a significant generation gap with parents reporting more mediating activities than children actually recognise (Livingstone and Bober, 2006). Research has identified several roles of parents in their relation with their children's use of digital devices. These have reflected research elsewhere (Livingstone et al., 2015). Parents 1) co-use – they are present, even share the activity with the child; 2) they offer active mediation – they discuss, critique, or

analyse the content their child is accessing digitally; 3) they resort to restrictive mediation – parents set rules that defines boundaries and limitations to the child's use; 4) they monitor – the parents check available history records after their child has used the digital device; and 5) they impose technical restrictions – parents set up software to filter, restrict or monitor their children's use. For the current research, parents reported that they used at least one of these methods of mediating their children's digital media use, however none of the interviewed parents have reported that their children used their digital devices in completely unsupervised and unlimited way.

Within the context of this thesis, hearing what parents thought about digital media use has helped to understand what they believed was a creative activity or creative production through the use of digital media and how they decided what stimulated creativity, while their children engaged with these. To that effect, this thesis has also aimed to clarify what creativity meant to the interviewed parents and the interviewed children and whether both parents and children looked for ways to stimulate creative activities in any specific way. Such understanding has helped to compare parents' opinions and beliefs with those of their children's. It has also helped to understand how their children's views and perceptions might be shaped; what may have exerted influence on what parents considered creative production when they allowed use and what they considered creativity in general.

The 20-question survey, outlined earlier, distributed among parents of the sample in this study (Appendix C) reflected five primary objectives:

(1) To understand what parents know about their children's engagement with digital devices;
(2) To identify parents' favourite activities and children's favourite activities on mobile devices according to parents;
(3) To gauge parents' knowledge of the various activities their children engage in when they are on their digital devices;
(4) To learn the features parents looked for in tablet applications that they allowed their children to purchase and use;
(5) To understand parents' role and presence during their children's engagement with digital devices.

3.6.3. CHILDREN'S PERSPECTIVE TO DIGITAL MEDIA USE

Personal interviews and focus group discussions aim to capture children's perspectives on, and experience, of their worlds with regards to digital media devices (Green, 2005). Personal interviews can best capture rich data when the nature of the research questions is of an exploratory character. For example, what children's personal experiences with their digital devices are, how they use them and what for can best be answered if children are let to speak freely through dialogues with another respondent (in the instances of focus groups). Here, children can still answer standardized questions. However, personal interviews and focus groups can allow the nature of the questions themselves to flow along with the conversation (Green and Hogan, 2005). A semi-structured form of interview serves well in cases where

clear hypotheses have not been identified. Through brainstorming on a subject, or on an idea, or on hypothetical scenarios, children can actively take part in the research process, and therefore immerse in it and deliver more valuable information than the strict, close-ended questions of quantitative research (Green and Hogan, 2005).

On the other hand, trying to gain an understanding about children's personal experiences through interviews or focus groups can prove harder in practice than it sounds in theory (Green and Hogan, 2005). For example, where children do not understand the question, they still tend to give some form of replies that do not necessarily mean the truth (Waterman, Blades, and Spencer, 2001). Any data should be interpreted with caution. Difficulties can also arise from the fact that children are not always used to being prompted to express their opinion and views. Often adults, like parents, teachers or other authoritative figures disregard children's views and opinions and reluctance in expressing opinions during an interview may yield little desired results (Green and Hogan, 2005). Focus groups, too, can have limitations in the types of results they can obtain from singular encounters. Comparing several focus group responses, on the other hand, can yield richer and "less 'performed'" results (Gauntlett, 2007, p. 6). Such circumstances have been taken into account during the data collection for this thesis. For example, the children who took part in the focus groups and the interviews were met at least twice. On the second encounters, the children were less 'ecstatic' about being taken out of their lessons (as interviews usually took place during school hours) and also seemed more at ease and relaxed to speak. Furthermore, the children were frequently reminded that there was no right or wrong answer regarding questions concerning their favourite activities on

their tablets, or what they liked making using their devices, or how they used their devices in class. In many cases, children were also given various materials to work with – Lego blocks, drawing pads and pencils, play dough – which allowed them to focus on making things while answering the explorative research questions related to their typical digital media use. Engaging the respondents in creative activities have shown to encourage individuals to connect with deeper thoughts, even aspects from their unconscious where "focused on creative activities gives us an opportunity to reach down into that ocean [from the unconscious] and bring up some significant truths" (Jung, 1961 in Gauntlett, 2007, p. 79). Finally, since the enquiry for this thesis has not been of sensitive nature – the interviewed children were asked to talk about their favourite activities on their digital tablets and how a typical school and non-school day goes for them – their responses seemed to come naturally, with ease and therefore were more likely to be honest and truthful.

Some of the questions asked to obtain information about the children's daily engagement with digital media devices, breadth and depth of use, daily routines, typical school day, general and specific interests related to their digital devices but not excluding other things have been the following:

- What digital devices do you have and are they connected to the Internet?
- Was it a gift – from whom, for what, etc.?
- Frequency of use; place of use; nature of use – alone or with someone else most of the time; share with someone else or your own personal device;
- Talk about your five (or more) most favourite apps and things you do when you are with your device. If the child/ren struggle to identify any one or

more, they are prompted to talk about the time and the reason they used it most recently;

- Favourite apps/games/activities: Describe the rules, the objectives, the challenges, the audio-visual aspects, characters; compare with other activities (on- or offline) and games;
- Discuss the things that you do with your digital devices: Prompts with suggestions to talk about things like taking pictures/making videos/creating slide shows by using a particular software application or program/making or listening to music/watching a video clip or any other audio-visual content/ creating or watching interactive photo albums/VR/build things/write things;
- Discuss favourite things that you have seen that your friends or others have created online or otherwise;
- Discuss things that other people, peers, users or friends have made that you would have liked to try out to make;
- Discuss things that you wanted to learn how to make and you checked online or any other way that involved your digital device and tried to learn to make it or create something;
- Discuss your overall favourite activities in school and outside school;
- Discuss typical school day – activities during school; favourite and least favourite activities;
- As above, discuss typical non-school day – prompts for this question can include: Talk about last weekend.

3.7. ANALYSIS OF QUALITATIVE DATA

The objective of this thesis was to identify how children, aged seven to ten, engaged typically with digital media technologies and use that as a platform onto which to build a model that can foster creative production in the school setting. The preliminary enquiry – how children engaged with digital media tools – fitted well with grounded theory, which can enable an inductive analysis of children's typical engagements with digital media technologies. In other words, the objective of this thesis was to identify how children lived and what they did with and through digital media technologies, why and what such engagements meant to them instead of looking at what theories exist that explain such processes of engagements.

While the constructionist, sociocultural, and critical perspectives to learning served as guideposts to this thesis with regards to how children learned, their engagements with digital media technologies was investigated from the point of view of the children themselves as they described them. Therefore, grounded theory seemed to best support the aim to induce and develop inductive categories from what children were describing about their current practices rather than search for data that would confirm or rebut an existing theory (Charmaz, 2011). Grounded theory allows for social scientific theory construction (Glaser and Strauss, 1967). It allows for flexibility and enables data collection that can help build "middle-range" theories (Charmaz, 2011, p. 360). The researcher becomes active and engaged analyst (Charmaz, 2011). Findings surfacing from inductive data collection can then be compared or analysed from existing theories. New suggestions, hypotheses and

questions can emerge as a result (Rosenthal, 2004; Reichert, 2007). Such work then can lead to advances in theory development.

As the qualitative interviews were collected, in many cases the same children were met at least two, sometimes three times. On first encounters, the children were approached with generic questions about school, everyday activities, extra-curricular activities, favourite activities when they engaged with digital media technologies, the types of technologies they possessed and other open-ended questions about how their typical school and non-school days would go about. This information was then analysed, coded into themes based on the number of children responding with similar descriptions. For example, children feeling tired and the type of use (or no use at all) of their digital devices during week due to extra-curricular activities were categorised into an individual theme based on: 1) The number of children who used the word tired and synonyms to it in relation to their school work and after school activities; 2) the type of use of their digital media devices as a result of the children feeling tired due to the described schedules; 3) the accounts children gave about their physical and emotional wellbeing having after-school things to do; and 4) the number and type of out-of-school activities on a typical week that caused the children to feel tired and the type of use (or no use at all) of their digital devices. The themes then were used to develop further questions: For example, how after-school activities impacted on their interests to or types of activities they engaged with their digital media technologies. Answers to these new sets of questions were then analysed again and concepts developed as a result. The emerging themes were re-used in subsequent interviews with the same children as well as with new respondents. Those new respondents who described similar realities and expressed

similar opinions about how they felt with regards to what they had to do after school were added to the overall number of respondents who ascribed to the same theme.

Thus, grounded theory allowed the researcher of this thesis to go back and forth between analysis and data collection and also return to the same interviewees for further clarification specifically when clear themes emerged. The finalised themes and concepts were done across all transcribed interviews manually. The main themes that emerged were discussed from sections 6.1 to 6.5. The themes further helped to identify the gap in opportunities for creative production among the interviewed children both in their informal and formal settings. These preliminary findings helped to further support the main objective of this thesis.

3.8. RESEARCH INSTRUMENT FOR PHASE 3

Phase 3 of this thesis consisted of the development and implementation of a creative method (Gauntlett, 2007) that aimed to provide an environment for children where they could engage in making a personal creative project of their own as means to self-organise in deep and interdisciplinary learning. The objective was to organize a series of practical workshops and set up projects at children's own initiative and propositions – on an individual level or in collaboration with others – to allow them to demonstrate their creative abilities by creating personal, meaningful stories – text-based or audio-visual – using digital tablet applications. The aim of this method relating to questions Q1, Q2, and Q3, outlined in Chapter 1, was to foster children's

creative production with such devices and demonstrate that a small group of children can organise themselves into building something meaningful to them and learn as they do so. The workshops ran in respect of the framework proposed in point 1.4.1 of Chapter 1 and controlled for elements identified in literature that correlate with fostering creativity. For example, the workshops had to meet the following conditions:

(1) Children were allowed to discuss things they cared about, were interested in, or liked to do – that is, identifying indicators related to children's affective involvement to the task at hand (Anderson and Krathwohl, 2001). The participants in the workshops were free to choose their own project. They were allowed to identify their own problem or idea and propose their own project goal (Savery and Duffy, 2001; Wilson, 1995). This also allowed to identify their active involvement in the task at hand (Ott and Pozzi, 2010);

(2) Brainstorming during the workshops included children's interaction and collaboration with others, as literature has demonstrated that brainstorming facilitates the creative process (Clements and Sarama, 2003; Neumann, 2007; Tiwana and McLean, 2005);

(3) Instruction with regards to the diverse aspects and affordances of digital media devices was available at the participants' request – as facilitation to the brainstorming sessions (Papert, 1993);

(4) The creative process and their projects' outcomes were to be the subject of the participants' own reflection and evaluation and not that of a teacher or another authoritative figure. Children were able to discuss each others' work and exchange ideas of what more could be done, what the process of the

workshop specifically and the outcomes from it in general meant to them, as evaluation and reflection forms part of the learning as well as the creative process (Guillaumier, 2016; Ott and Pozzi, 2012 and 2010).

The main research question of this thesis aimed to foster creative production through the use of digital tablet applications as a suggestion to introduce such use in the classroom. Here it must be stressed that proposing such method for the classroom where children are given some freedoms to make creative things through the use of digital tablets, instead of just being asked to practice Maltese, or religion, or maths, is not "a random, illogical or pointlessly 'novel' way" (Gauntlett, 2007, p. 92) but a demonstration that children, as any human being, have not only "interest in producing visual and artistic expressions…stretching back over thousands of years" (Ibid.) but interest in learning – as the larger implication to introducing such method – before children are even being instructed to do so, as it usually goes in the classroom. The assumption of using such method stems from the proposition made in this thesis that creativity is at the heart of children's desire to and love for play, discovery and exploration of the social and physical environment that surrounds them; that creativity is the result of one's wish for self-expression, for demonstration of a personal viewpoint or an idea; that creativity is also an act and a process that involves and leads to some form of learning and experience.

The method used to enable creative production with a tablet application that allows the design of audio-visual, text-based, or a physical object, project, or performance aimed to capture how children, aged seven to ten, can self-organise to create such meaningful projects, products, or ideas and the learning process they could undergo

throughout this creative process. The objective of using such a method was in part to engage children's minds, hands and creativity (Gauntlett, 2007). Rather than ask them to talk about things, they were asked to make things that they were interested in, mattered to them, or were their own imaginations (Gauntlett, 1997, 2007, 2011). Using this method of asking children to make things was done for at least three reasons. First, children's own interests, thoughts, and perspectives can be encouraged with greater success when they engage in creative production with digital media devices in class than when they engage in the typical use that happens currently in Maltese primary schools that is to practice maths, religion or reading skills. Second, such method allows children to express themselves with the tools that form part of their own culture (Gauntlett, 1997; Marsh, 2010). Thus, they are allowed to express themselves – create and learn – with the tools they like, they relatively know and are comfortable with rather than limit them to verbal descriptions or survey responses. Finally, using such a method where children engage in making something that they think about, are interested in or care about, has previously yielded rich results before with regards to how children interpret and create media messages (Gauntlett, 1997) and also with regards to how children learn in a self-organised way with digital media tools at minimal intervention (Mitra, 2003; Mitra and Rana, 2001).

In practical terms the method of research was organised in the form of workshops in which small groups of children, aged seven to ten, were asked to create a project or a product that could be either audio-visual or text-based, that fulfilled personal interest or meaning to the creators. Throughout this process of making a creative project, the children's self-organisation, attitudes, feelings and feedback were recorded; the

process of learning that took place throughout their work was also observed and analysed.

A number of conditions were met within the boundaries of these workshops, which were organised in settings that were familiar to the participants such as a school gymnasium, a school theatre, a schoolyard, or a classroom. The conditions controlled for were based on the constructionist views to learning and creativity, the sociocultural and the critical pedagogical theories. The theoretical parameters of the workshops were the following:

(1) Creative production can be fostered by allowing children to experiment, explore personal interests and goals and construct projects, products and ideas;
(2) Self-efficacy and personal motivation has to be encouraged alongside the efforts to encourage creativity;
(3) Children's personal interests must be identified, acknowledged and encouraged;
(4) Facilitation through instruction must support the efforts to foster creativity and making things through the use of digital devices.

The conditions controlled for during the workshops were outlined from the literature reviewed for this thesis. Detail of these follows.

3.9. WORKSHOP PARAMETERS

A number of conditions were controlled for during the workshops. Those conditions stemmed from the theoretical perspectives underpinning this thesis. Specifically, literature has cited a number of elements, key to the creative process. From developmental viewpoint – respecting constructionist views (Papert, 1993) – for imagination to take place and ultimately development and learning (Vygotsky, 1978), a combination of personal (or others' shared) experience, freedom and time must be present. For example, personal or others' shared experience agrees with what Neumann (2007) found at a Heidelberg chemical lab. Scientists there had attested to how high interactivity enhanced their innovative thinking and new ideas formation.

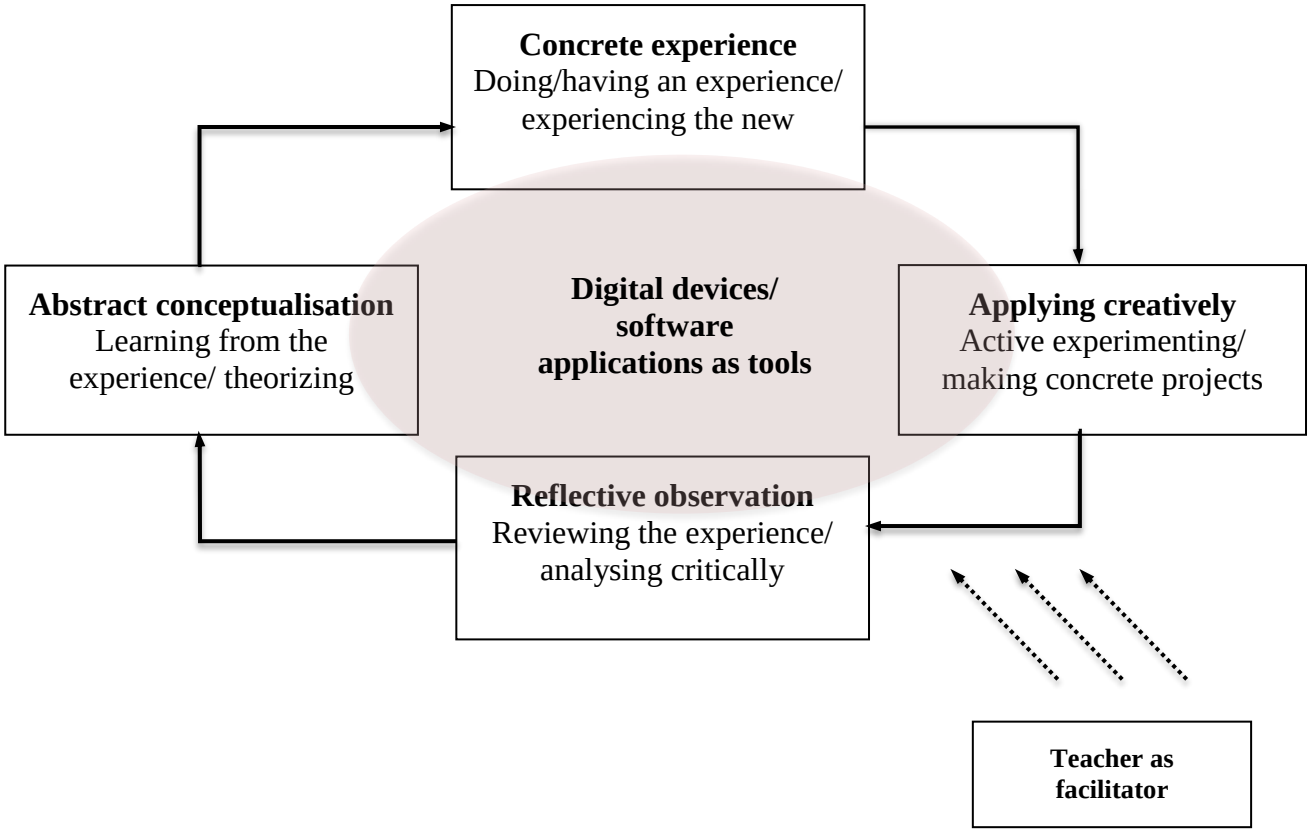
Another important element to the creative process and as a prerequisite to normal cognitive development and respected during the workshops was play (Russ, 2003; Vygotsky, 1998; Kagan and Tarrant, 2010; Marsh, 2010; Tan, 2008). Other conditions involved the opportunity for experimentation, trial and risk-taking. When interaction occurs in a free manner among people from various backgrounds (Neumann, 2007) as in brainstorming, communication, and open discussions, when there is an opportunity to manipulate different materials, tinker and experiment with various tools (Gauntlett, 2011), when connecting existing things into a third, new, element (De Bono, 2009), creativity seems to flourish. The strong sense of control and the freedom to experiment with various materials, concepts and ideas – the

process of cognitive playfulness (Tan, 2008) – demonstrate high creative capacity (Gardner, 1993).

The multi-dimensionality of digital devices provides the opportunities for all of these elements to be present. Such rich, interactive, new media environments, once translated to the classroom, must enable supportive imaginative environment (Eckhoff and Urbach, 2008; Benson and Lunt, 2011). The conditions that foster creative production as outlined by literature can also apply to any formation and organisation (Neumann, 2007), including the classroom of primary school children. Such conditions therefore were respected and applied to the workshops. Finally, and importantly, the objective of the workshops was to enable children's active participation in the creative and the learning process as they engaged in building a meaningful project of their own. This was done first because the participants themselves make a statement of their own understanding, thoughts and views through their creation and also because they can experience and learn from this in the course of making their project (Gauntlett, 1997).

The design-based workshops, conducted for this thesis, were based on the model presented in figure 3.1. This model presents the elements that literature has demonstrated can encourage creative production.

Figure 3.1



3.10. WORKSHOP OBJECTIVES

One way to understand children's creativeness, their personal motivations, desires, and their perspectives of their surrounding world – how they learn and what they care to learn – may be by allowing them to demonstrate what they can or would like to do; let them take an active role in such an enquiry. This belief has led to the set up of the workshops as the main research instrument of this thesis, which has aimed to transform current educational practices in typical classrooms (Kelly, 2003) and

foster creative production through a constructionist, sociocultural and critical pedagogical approaches to learning.

The workshops aimed to encourage children to team up in small groups and complete a project, product or develop an idea of their own, using pre-selected digital tablet applications for making digital interactive books, comic strips or audio-visual clips. Such work would be facilitated with instruction when the children seemed to need some form of direction, expertise or training (Mumford, Scott and Leritz, 2004) all of which could potentially stimulate the children's creativity further (Vygotsky, 1966). The workshops additionally adhered to the view of self-motivation (Deci and Ryan, 2008), playfulness and the willingness to take risks (Amabile, 1983; Hennessey, 2010) as important aspects and precursors to creativity. Lastly, with critical view in mind, the workshops also aimed to encourage risk taking and subjectivity in order to acknowledge the role of the child's agency and perspective (Chisholm, 2008), which are also fundamental to creativity.

The workshops aimed to identify if the research agreed with each of the three theoretical perspectives underpinning this thesis. For instance, merely letting children construct with digital devices does not necessarily lead to the completion of anything concrete (Kirschner, Sweller and Clark, 2006). Just tinkering about may lead children to boredom (Lemerise, 1993; Clements and Sarama, 2002). Instruction and facilitation, guidance and encouragement were also deemed necessary to complete each workshop. Following instruction and mechanically creating a project was not the sole aim of this research. Children were also encouraged to critically

reflect on their creations and to identify their personal interests as the main drivers behind their projects.

Seven workshops were carried out among children from private, church, and government schools between October 2015 and January 2017. The workshop structure was pre-tested during October 2015. The participants of the workshops came from different socio-economic backgrounds and varied in ages from seven to ten. Each workshop consisted of three sessions on three separate days with one hour per each session. Total elapsed time for each of the workshops exceeded the hour originally allocated for each of the sessions. Each participant school allowed more room for the children to finish their projects. The participants were also respected for wanting to continue on their designs. Further details regarding the workshop structure, participants' profiles, processes and outcomes from the workshops follow in chapter 4.

3.11. ETHICAL IMPLICATIONS

Research with children requires more than observations for the obvious, overt behaviour, or tests to measure skills, behaviours, or knowledge. This thesis involved methodology that required more cognitive exploration to children's knowledge of, engagement with and creative ability through their use of digital devices. To obtain such information but also to dispose children to feel at ease and encourage them to complete the questions at hand can prove difficult. It can potentially affect the

internal validity of the research and can also create ethical issues that would need to be considered.

In accordance with local law and regulations in Malta via the Directorate for Quality Standards in Education Research and Development Department (no date), to conduct research in schools in the country, first approval for conducting research in schools must be obtained from the department itself and then consent forms must be obtained, signed, by the parents of minors to take part in the research (Ministry for Education and Employment). Legal approval from the department was successfully obtained. This allowed for entry into the government schools. Approval to conduct research in the Maltese church schools was also obtained from the governing body of those schools – Curia, the Malta Diocese. And with regards to the private schools, approval was obtained on an ad hoc basis with the principals (owners) of the schools. Each school principal – of all participant government, private and church schools – were met in person. The objective of the thesis, the requirements, the outcomes and the possible benefits to them as a result were clearly put forward during the meetings. Consent forms were then distributed among the randomly selected classes in each participating school. Each consent form (Appendix B), available in both English and in Maltese (for the convenience and clarity of parents) clearly stated the nature, objective and benefits from conducting this research. Detail about the manner in which the interviews with the children would be done showed clearly in the consent form that only audio recording would be used for the convenience of data collection. Anonymity, data protection and storage have also been ensured. Parents' signatures were collected as a result.

However, the ethical considerations when conducting research which children do not stop with their parents' approval. In respect to their rights as individuals (UN, 1989), several principles have been used to set the ethical guidelines to this thesis. The first one is *autonomy* (Beauchamp, 2008). This suggests that children are able to consent through free choice, without fear or inhibitions of any kind that they will lose on anything or be disadvantaged if they opt out from taking part in the research. Guided by this principle, this research was clearly explained to the children prior to commencing work. All children agreed to be interviewed, either in a one-to-one conversation or within a small group with other pupils. There were instances where some children's parents did not sign the consent forms. Those children were not selected for the interviews. In one particular case, however, a child's parent did not sign the consent form, the child still wanted to take part in the group discussion. With the approval of the teacher and respecting the child's enthusiasm, he was accepted in the group discussion.

When conducting the interviews and the focus groups the children were, beforehand, shown the audio-recorder (an app on an iPhone) and it was clearly explained that the conversation would be recorded only for the purpose of convenience of this research. The children's permission was taken for the audio to be recorded even though their parents had previously consented to it. Another ethical guideline respected in this study is *justice* (Beauchamp, 2008). According to it, children selected for the enquiry are treated fairly and equally, without judgement. *Non-maleficence* and *beneficence* also serve as ethical guidelines for this research (Beauchamp, 2008). The nature of this thesis, the questions that children were expected to answer, and the manner in which information was obtained from the participants did in no way pose any risk of

harm to them. The research aims to act to the benefit of those taking part in the research in that, through children's discussions, demonstration, and experimentation, the aims of the research will be to understand the breadth, depth and skills children possess with regards to their use of digital devices, and to develop a practical model, with a constructionist framework, to foster children's creativity through their use of digital devices. The risks emanating from these goals are minimal and controlled. One possible risk during this research would be for a child to happen to access inappropriate content online while using a digital device. Setting restrictions on the digital devices and the Internet default restrictions imposed by the schools in which the research takes place has controlled for such risks.

Finally, the level of participation of each child selected for this thesis is decided according to the ladder of participation (Greig, Taylor and MacKay, 2008). This is to say that research is conducted with children's participation, not something that is done *to* them. The children are not seen as passive or inadequate in the presence of media but rather as active participants in the way they interpret, use, or produce various media messages to express their own views, opinions and perceptions about various subjects (Gauntlett, 1998a). Furthermore, the aim here in this thesis has been to demonstrate that when given the opportunity children can demonstrate their media literacy not only as readers but also as "*writers* of such media" (Gauntlett, 1998a, p. 10). For the explorative phase of this study – identifying children's use of and knowledge in digital devices – the children, as well as their parents, on separate accounts, took part as informants. They gave accounts to their daily behaviour, favourite, and routine activities when they engaged with digital devices. For the design-based research phase – encouraging children to demonstrate their creative

abilities, experiment, and create their own ideas using digital tablets – the participants took the role of 'initiators' and 'directors' of the research (Greig, Taylor and MacKay, 2008).

3.12. CONCLUSION

Some of the literature reviewed for this thesis has suggested that the use of certain digital devices and software applications can limit creativity (Buckingham, 2007; Gardner and Davis, 2013; Kim, 2011). Other studies have shown the opposite (Lieberman, Fisk and Biely, 2009; Clements and Nastasi, 1996; Clements and Sarama, 2003). These opposing views have led to an understanding that research revolves around the question that leads to a yes/no dichotomy of whether digital devices trigger or stifle creativity. Here the aim has been to revise this question to say, rather than looking at finding results that have a binary dimension, which is rather limiting, can children take on an initiative of their own choice and see how digital devices can fit within that choice? Then, the notion that digital media devices are simply tools changes the current predominant attitude towards them as a reward for good behaviour or a jingle to an already established curriculum (Buckingham, 2007) as the findings of thesis follow in detail.

In the case of this thesis, the method of choice therefore has rested on two premises. The first one was that this research should be proactive and should aim to achieve practical solutions. Design-based research allows for flexibility (Ott and Pozzi,

2012), that is, participants can take a more active role in the research process. Therefore this thesis takes the stance of not only doing research about children but also *with* them. Research becomes more flexible – the rigidity of the school environment can be remoulded by letting the children take an active role in the research process by being encouraged to follow their motivations to create, experiment and make things. The second premise related to the direction the participants in the workshops were given. Where children (are encouraged to) give more importance to learning goals (Dweck, 2000; Tan, 2008) rather than performance goals, they are more likely to take on the opportunities and affordances of digital media devices and be more experimental and therefore more likely to delve in creative production.

The current state of a typical classroom in a standard private, government or church Maltese primary school takes a linear hierarchical structure, where the teacher is the sole executive and decision-maker about the learning objectives and outcomes for each lesson as has been the case elsewhere (Ott and Pozzi, 2010). Children take a passive position. They are on the receiver's end, waiting to be instructed (Papert, 1993; Resnick, 1998; also from current observations conducted for the purpose of this thesis in all three types of Maltese primary schools). Where digital devices currently are incorporated into this structure, they are only used to support the subject the teacher is teaching. In other words, digital devices support and aid the already established curriculum. Such arrangements, however, neither allow children to have any say in it, nor give them any opportunities for independence and demonstrate agency over the tools they are handed.

Although the work surrounding this thesis neither comes from nor leans solely towards pedagogy, it does look at how education is organised in the Maltese classrooms, specifically how the digital tablets are used in the educational structures of the Maltese primary schools. This happens only insofar as the context is concerned – in this case the way lessons go about in a typical primary school classroom – as they form part of the ecology, which children inhabit. The learning conditions, if not changed, are challenged with the digital tablets becoming a mainstream tool in primary education (Digital Malta, 2016).

CHAPTER 4

OVERVIEW OF RESEARCH FINDINGS

4.1. INTRODUCTION

The angle from which this thesis has discussed creativity is not specifically creative engagement with digital devices but creative production with digital tools – thinking with such tools (Resnick, 2017). While children spend time daily with digital media devices and can interact with various applications with relative ease, this thesis has looked at what seven- to ten-year-old children in Malta creatively produce using their skilful navigation with such devices.

Therefore, creative production in the context of this thesis relates to learning. Consequently, the theoretical framework of analysis for this thesis also has based itself on theories related to learning. The reason for that was twofold. Firstly, as noted earlier, children learn by making and creating (Papert, 1987; Resnick, 2014,

2002, 1998), through discovery (Moreno, 2004), and through enquiry and experiment (Kirschner, Sweller and Clark, 2006). Secondly, to be creative and to develop ideas through the use of digital devices can also be seen as a process of learning how to be creative. In other words, creativity can be seen as an activity that leads to learning and at the same time it can be seen as a process of learning how to delve into creative production with digital media tools.

Linking creativity and learning therefore has led to the focus on learning theories, specifically the constructionist and sociocultural perspectives on learning. Learning does not necessarily happen in formal settings only (Sefton-Green, 2010) as much as children can also learn by playing video games (Gee, 2007) or by connecting with others or experimenting with all kinds of tools and material (Gauntlett, 2011, 2015). Similarly, learning cannot be subjected to the social and cultural systems of a society (Chisholm, 2008) but rather the individual's agency, perspective and experience, too must be considered as factors that shape the learning process. Therefore, this research has also drawn from the critical views of pedagogy specifically where it has looked at how digital devices are slowly being employed in the classroom to serve an already established pedagogy, thus risk downplaying the larger opportunities stemming from the use of such tools by reducing "learning to a technological comprehension of the world" (Macedo and Freire, p. 58). To avoid such limiting imposition of use, school must incorporate technologies to encourage risk taking and subjectivity – that is to acknowledge the role of the child's agency, perspective and experience – which are fundamental to creativity. With these theoretical perspectives in mind the objective of this thesis has been to zoom in on the learner – the child –

and identify the ways in which he or she delves into creative production with digital devices and to identify potential methods that can enable and instil such activities.

4.2. OVERVIEW OF RESEARCH PHASES 1, 2 AND 3

The below findings were produced as a result of three phases of research that included qualitative and quantitative methods (Table 4.1) summarises the participants, the research instruments and the objectives of each research phase for this thesis). As outlined earlier, Phase 1 consisted of a 20-question survey which aimed to collect data about the children's parents in this study and their knowledge of their children's digital media use. Interviews with 48 parents were also carried out. These aimed to understand parents' perspective on children's creative production through digital media. Phase 2 of this research included personal, semi-structured, interviews and focus groups (Denzin and Lincoln, 2011) with children about their digital media use; their favourite apps and games; and their use of digital media in school. The guiding questions during this phase of the research were:

(1) What does it mean to be creative? Prompting for examples – asking children to explain what creativity means to them; when they feel creative; when was the last time they created things and what these were and similar questions;

(2) What does it mean to be creative when using the digital tablet? Prompts to give examples, to demonstrate (children were allowed to bring their own tablets during the interviews and focus groups or in some cases they

demonstrated using the researcher's tablet which was internet-connected and available to download apps or browse as per the child's directions)

(3) What are children's favourite activities on their digital media devices and which of these they can categorise as ones that make them feel creative or allow them to create their own personal things?

(4) How their use of digital media devices compares to how these are being used in the schools that already do and how do children view the use in school, compared to their own personal practices at home?

For phase 3, the method of direct observation (Pellegrini, 2001; Herbert, 1970; Ott and Pozzi, 2010) was used when the workshops were designed for seven groups of 21 children in total. Details follow next. The direct observation method allowed for the researcher of this thesis to monitor, facilitate and control for the conditions as per the suggestive model for fostering creativity through digital media devices. This method aimed to facilitate observation and detailed recording of the performance, the attitudes and the overall process of creating a project by the participants of the workshops (Ott and Pozzi, 2012).

Table 4.1 Summary of research phases, instruments and objectives

<table>
<tr><th></th><th colspan="2">PHASE 1</th><th>PHASE 2</th><th colspan="2">PHASE 3</th></tr>
<tr><td>PARTICIPANTS</td><td colspan="2">309 parents of the 342 interviewed children or 85.4% of all distributed questionnaires were returned to the researcher completed.</td><td>8 teachers – 5 ICT teachers and 3 teaching general subjects

4 school principals</td><td>342 children aged 7 to 10
9 children aged 11</td><td colspan="2">Group 1: 4 children, 2 boys, aged 9 and 10 and 2 girls, aged 9 and 10
Group 2: 3 children, 2 boys, aged 7 and 1 girl, aged 8
Group 3: 3 children, 2 boys, aged 8, one girl, aged 9
Group 4: 2 children, one boy aged 8, one girl aged 10
Group 5: 2 girls, aged, 9, 10
Group 6: 3 children, two boys aged 9, one girl, aged 9
Group 7: 4 children, 2 boys aged 9 and 2 boys, aged 10</td></tr>
<tr><td rowspan="2">RESEARCH INSTRUMENT</td><td>20-question survey questionnaire for parents</td><td>Personal interviews with 48 parents</td><td>Personal interviews</td><td>Semi-structured interviews and focus groups</td><td colspan="2">Project-based 3-day workshops</td></tr>
<tr><td colspan="4"></td><td>Direct observation and free style notes, audio recording conversations</td><td>Monitoring of behaviour, attitudes, abilities, facilitation, and support</td></tr>
<tr><td>RESEARCH OBJECTIVE</td><td colspan="2">To gauge parents’ knowledge of their children’s use of digital devices; to understand parents’ own digital media use; to learn about their ways of fostering creativity through the use of digital media tools.</td><td>To gain their perspective on digital media use for creativity; to learn about the current ICT curriculum and gauge their attitude toward children’s digital media use.</td><td>To gauge children’s interests, habits, daily engagements with digital devices and other activities in general in their lives.</td><td colspan="2">1) To monitor, evaluate, identify and record how children engage with digital devices for creative purposes
2) To foster creativity through the use of digital media devices</td></tr>
</table>

4.3. PROFILE OF SURVEYED PARENTS

Three hundred and nine parents completed the 20-question survey. The majority of respondents fell within the 35-44-age bracket (68%). Eighty-three per cent of the respondents were female and 16% – male (chart 1 a and b). There is a representation from various levels of employment (chart 2). Children's type of schooling (chart 3) reflected parents' level of employment (chart 4) – the higher level of employment the more likely the child enrolled in private education.

Chart 1 a: Age distribution of parents who completed the survey questionnaire

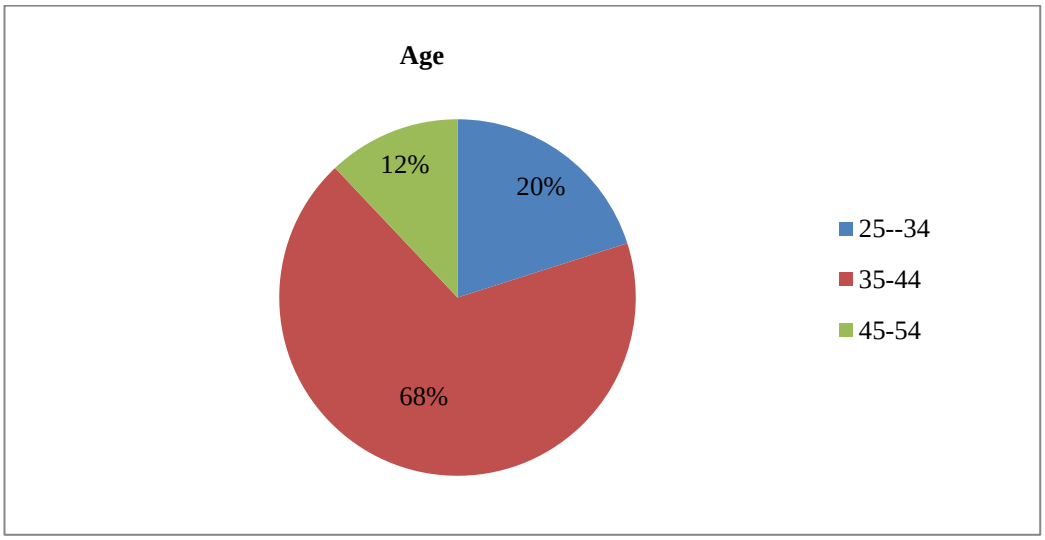


Chart 1 b: Gender distribution of parents who completed the survey questionnaire

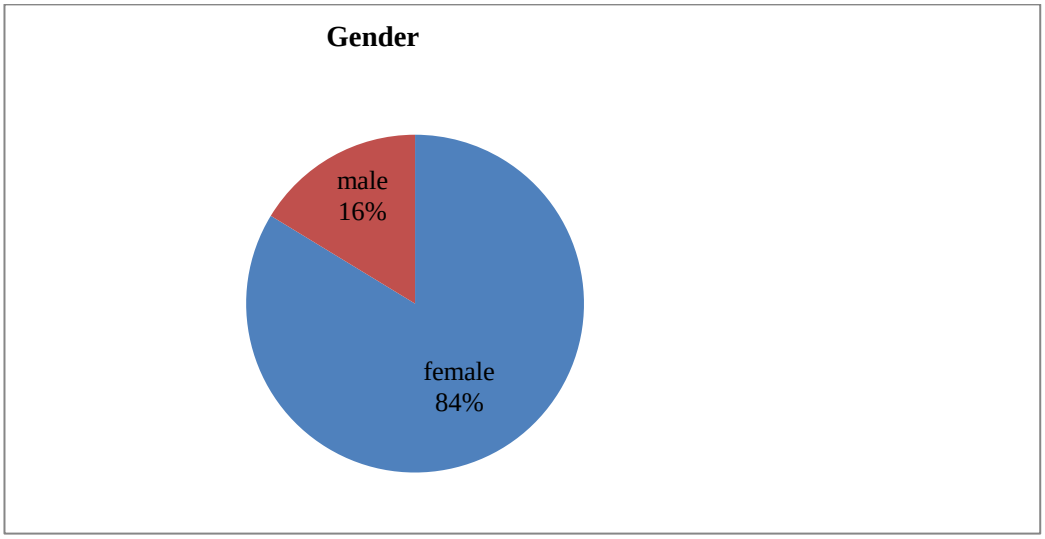


Chart 2: Distribution of surveyed parents according to their level of employment

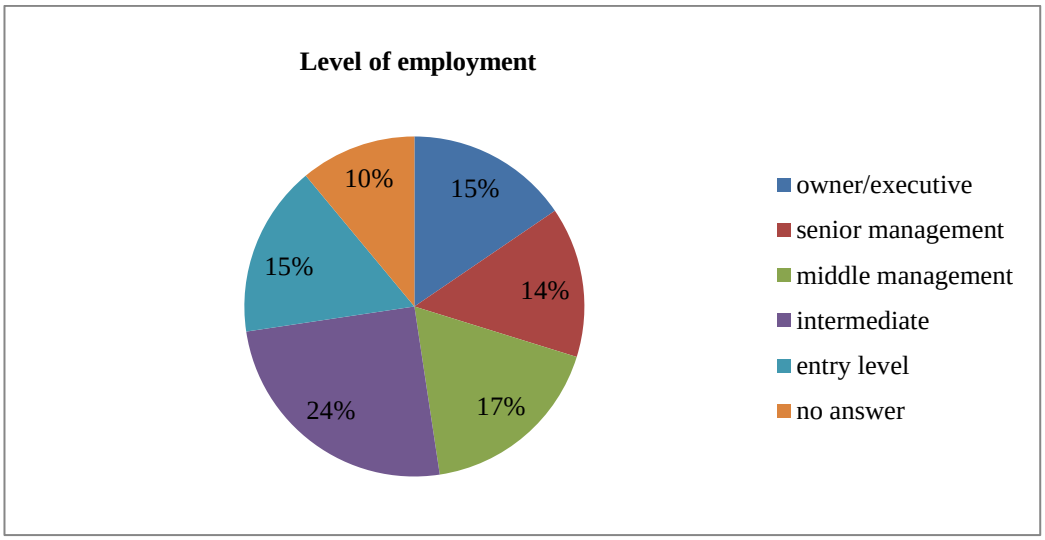


Chart 3: Type of schooling of the child for which the surveyed parents responded

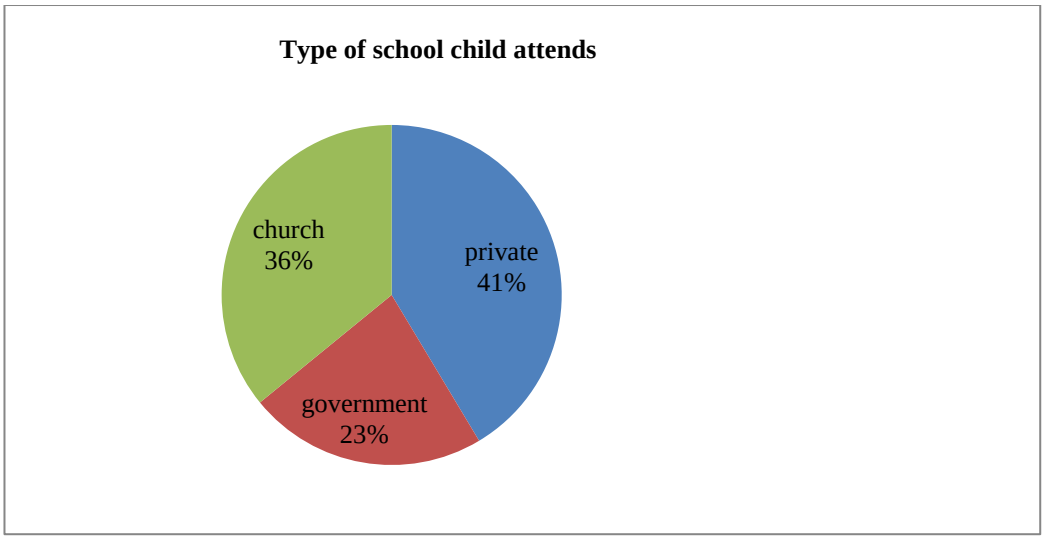
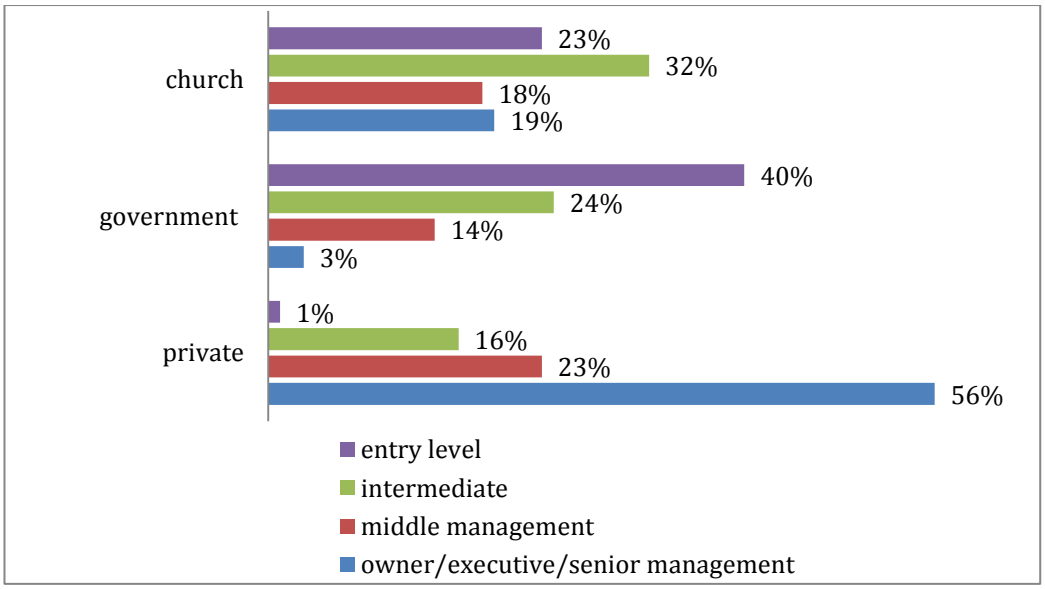


Chart 4: Correlation between parents' level of employment and their child's type of schooling



4.4. PROFILE OF THE PERSONALLY INTERVIEWED PARENTS

Forty-eight parents were also personally interviewed either individually or in small groups of 3 or 4 parents (Table 4.2). The parents were met after they dropped off their child at school or during their children's playtime in the afternoons in public parks. Some parents were individually interviewed while waiting for their children to finish extra curricular activities or at parties. Table 4.2 contains profile of the personally interviewed participants.

Table 4.2 Profile of parents who were personally interviewed

Parents	Interview type	Age	Gender	Education	School their child attends
11 parents: 5 couples and 1 single mother	Personal interviews	35-54; Single mother's age 32	6 female and 5 male	4 couples with some post-secondary or college degree; 1 couple with up to secondary degree Single mother – without secondary degree	3 couples – private mixed school; 1 couple – private, boys only; 1 couple – church school; Single parent – government school
14 parents	Focus groups 2 groups x 4 parents 2 groups x 3 parents	25-34 and 35-44	Female	With at least secondary education	2 groups – church school 2 groups – private school
23 parents	Semi-structured conversations on various social occasions	35-54	Female	Some post-secondary or college degree	17 from private school, 6 from church school

4.5. PROFILE OF THE INTERVIEWED CHILDREN

The interviewed children for this thesis were 342 in total (table 4.3). It was not always possible to control for a balance between gender, age and school type where the children came from as the selection of the children for the semi-structured interviews and the focus groups depended (1) on the parents' consent and (2) on the teachers' allocation for time and place for these interviews to take place.

Difficulties arose when trying to obtain access to all-girls church schools, specifically with regards to interviewing ten-year-olds. Two classes from one church school were interviewed during the first year of this research. The work encompassed over a week of meetings with each class. Besides taking interviews

with these seven- to nine-year-old girls, observations and interview with their teacher also took place. A small group who volunteered took part in the first 'creativity workshop' as part of research phase 3. However, the parents of these children did not fill up the questionnaire, which the other parents did. The reason was that the children had to prepare for end-of-year activities and the organisation for distributing surveys and chasing children to remind their parents to return the questionnaires completed was an arduous task, which the principal of that school decided not to take. Also there were no interviews with girls, aged ten, from church schools. These drawbacks are explained with detail in chapter 9.

The distribution of the children per school type was as follows: 144, or 36% of all interviewees came from a church school, 70 children, or 23% of the total sample were from government schools, and 128 children or 41% of the total sample were from private schools.

Table 4.3 Summary of the interviewed children according age, gender, and school.

Child's age	**Gender**	
	Boys	Girls
7	9 (private) 7 (government) 31 (church)	16 (private) 14 (government) 16 (church)
8	26 (private) 11 (government) 27(church)	14 (private) 15 (government) 13 (church)
9	21 (private) 8 (government) 27 (church)	17 (private) 10 (government) 5 (church)
10	11 (private) 2 (government) 20 (church) 1 (with special needs)	9 (private) 3 (government)
11	2 (private) 5 (church)	2 (private)
Total	208 boys	134 girls

4.6. CONCLUSION

The interviewed sample was a good mixture of children who came from all kinds of backgrounds and from the three major school types that can be found in Malta – church, private and government (Ministry of Education, Malta). Some of the interviews took place on a one-to-one basis. Other conversations took the form of focus groups, with six to eight children per group. There were cases in two private schools, one government and one church school where whole classes of children were interviewed together as that was the only way allowed by the principals of these schools. In these four cases the allocated time for conversation was over three hours long, spread over three days (one hour, lesson-long, per day). There was control for making sure that each child in the class had a chance to speak.

The surveyed and the personally interviewed parents also came from mixed socio-economic backgrounds. It was not always possible to control for a balanced representation with regards to gender, age and socio-economic background for both parents and children. Some of the stumble blocks related to personal availability. For example, more mothers were available for interviews than fathers, especially in the government schools.

The research did not aim to gain a national representative sample. Nevertheless, with 15,652 as the total population of seven to ten-year-old children on the Maltese islands (NSO Malta, 2016), the number of the interviewed children, 342, represents approximately 5% margin of error. In other words, the rich qualitative data collected

from the interviews and focus groups can be representative of that particular population within the context of this country.

CHAPTER 5

FINDINGS OF RESEARCH PHASES 1 AND 2

5.1. INTRODUCTION

This chapter presents the findings from the first two phases of research carried out for this thesis. The research conducted for phases 1 and 2 were concerned primarily with three issues. The first one stemmed from the objective to map the current ownership of digital media devices and the breadth and depth of digital media use among children in Malta, aged seven to ten, from the parents' viewpoint. The second objective aimed to capture the parents' perspectives of their children's use of digital media overall and specifically what parents understood creative production through such use and what efforts they put, if they did, to foster such creative use. The third objective related to the first two: The parents' perspectives were used to compare to those of their children's on all matters – from ownership, to everyday creativity and creative production through the use of digital tablets.

Obtaining preliminary data – the first and the second objective mentioned above – in order to make such comparisons (to satisfy the third objective) can reveal what children, on the one hand, and parents, on the other, find most salient in terms of creative production, and, in general, children's and parents' perception about digital media devices and the role of such tools in the lives of the interviewed children. Specifically, driving questions behind this research were: Do children and parents interpret the various purposes for use the same way? How do the parents' and the children's interpretations and perspectives of creative production with digital media devices reflect what literature says about what should be considered creative production with such tools? Can any specific discrepancies with regards to parents and children's interpretations of digital media use be drawn? For instance, parents may value and interpret the use of numeracy and literacy practice through digital tablets more than children do. The notion that "literacy is a matter of learning the standard language" (Freire and Macedo, 1987, 142) manifesting itself in an emphasis to learn technical skills may predominate in parents' interpretations of what is considered creative, even useful, use of such devices. To children, on the other hand, such interpretations may differ considerably.

Identifying such differences can have larger implications over the family dynamics – what parents, for instance, encourage at home or what is discussed and how various activities on the digital media devices are being interpreted. Identifying such differences can have implications to how school then takes over to apply digital media devices in the classroom.

Literature exists on the subject of parental mediation when it comes to Internet use and digital media use in general (Livingstone et al., 2015). Others delve into parents' interpretations of digital media use specifically where, according to Hollingworth et al. (2011) for example, parents can view use according to thinkable and unthinkable, desirable or undesirable in terms of use. Yet other studies look at the various parental styles, reflecting more general forms of parenting. For instance, some parents deal with digital media use in a more authoritarian manner while others are less demanding and uninvolved (Nakayama, 2011). None of those studies however examines the creative production with digital tablet applications among children, aged seven to ten, and parents' interpretations or attitudes towards such use. This further points to the need for such comparison of child and parent perceptions of digital media use because changing the angle of research with regards to parental mediation to address how parents mediate creativity through digital media devices can first reveal different parental mediation strategies – authoritative parents may be more liberal when it comes to video-making or blogging – and second, it can further lead parents to change their mediating roles. So, if children use digital media for creative production – say, a child runs a blog on a topic of personal interest – a highly authoritative parent may have a different mediating style or even change their style towards Internet and digital media use of their child in that particular regard. This chapter begins with data generated on digital media use of the studied children, aged seven to ten, according to their parents.

5.2. THE PARENTS' PERSPECTIVE: OWNERSHIP AND USE

Of the 309 survey respondents, only 3% said that their child did not own a digital tablet. Eight per cent did not give a response to this question. The remaining nearly 89% of parents said that their child owned a digital tablet such as an iPad, Samsung, or Lenovo (chart 5a), while 46% said that their child owned a smartphone such as iPhone or Samsung (chart 5b). Charts 6 a and b show parents' responses to the question which of the devices their child has used in the past six months. For the purpose of this thesis reference is made only for digital tablets and mobile phones among other devices such as handheld games consoles, desktop computers, laptops, or other digital reading devices such as Kindle and Nook.

Chart 5 a: Digital media devices the children in this study owned, according to their parents

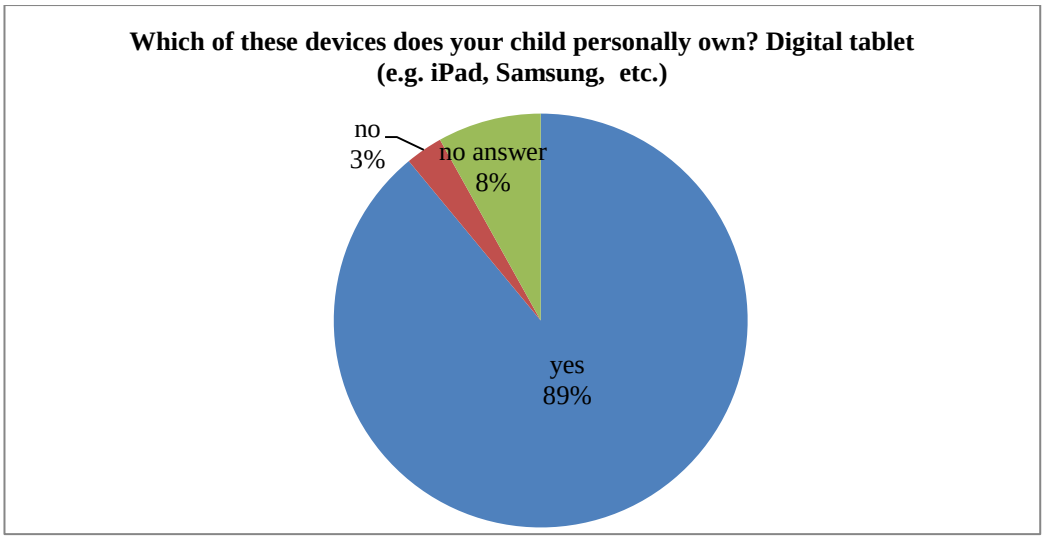


Chart 5 b: Digital media devices the children in this study owned, according to their parents

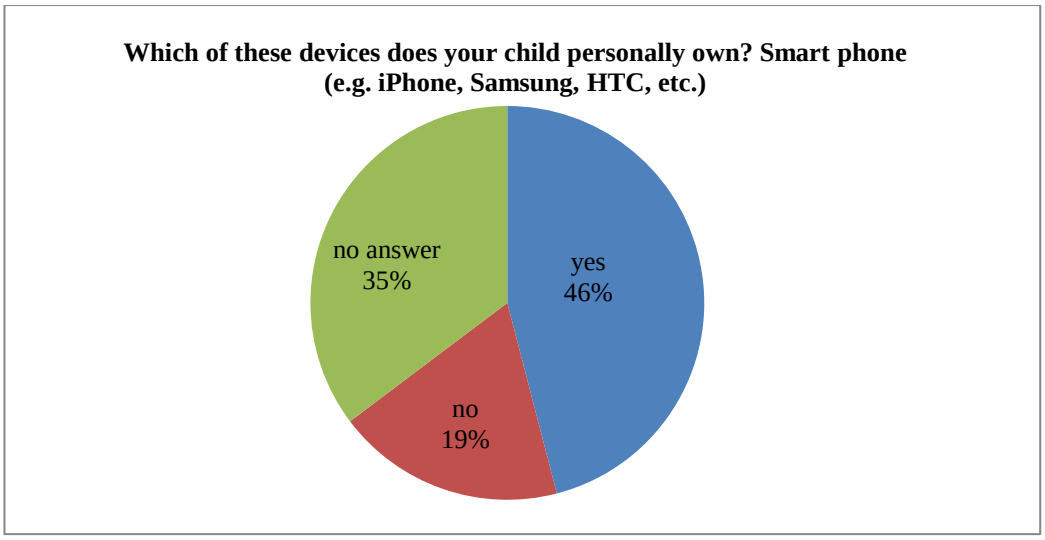


Chart 6 a: Digital devices the children in this study used in the past six months

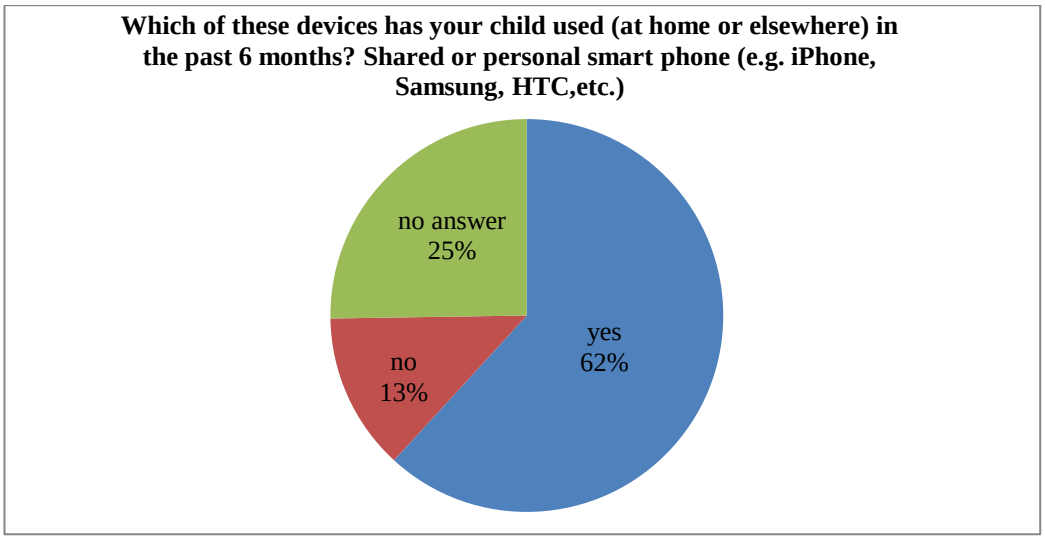
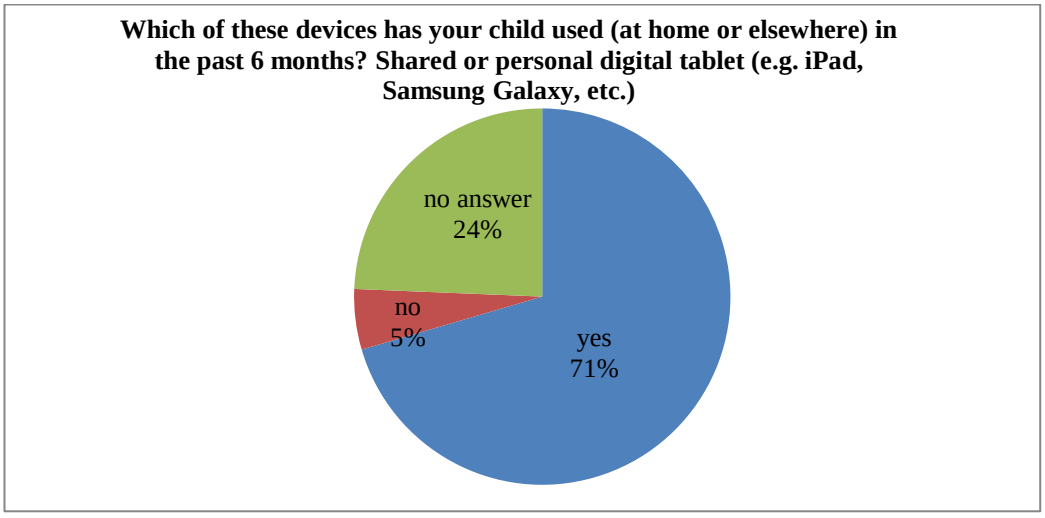


Chart 6 b: Digital devices the children in this study used in the past six months



Daily use, according to the parents, was mainly limited to below 45 minutes (39% of respondents) or up to an hour (18% of respondents), while 21% of them said that their child never used a digital media device on a school day (chart 7). These responses matched the children's responses. The majority of the interviewed children, in particular those from private schools, said that they did not use their personal tablets or phones during school time mainly because of the workload they had and the extra curricular activities that occupied fully their week days. On the other hand, on a non-school day, children seemed to pick up on their digital media use as around 64% of them spent more than an hour (charts 7 and 8).

Chart 7: Average time children spent on their digital devices during school day

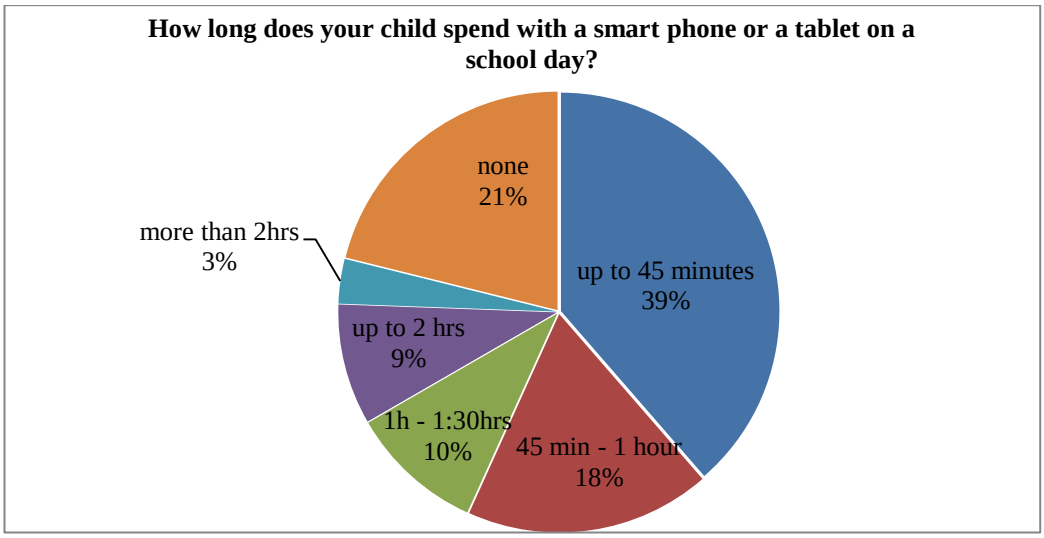
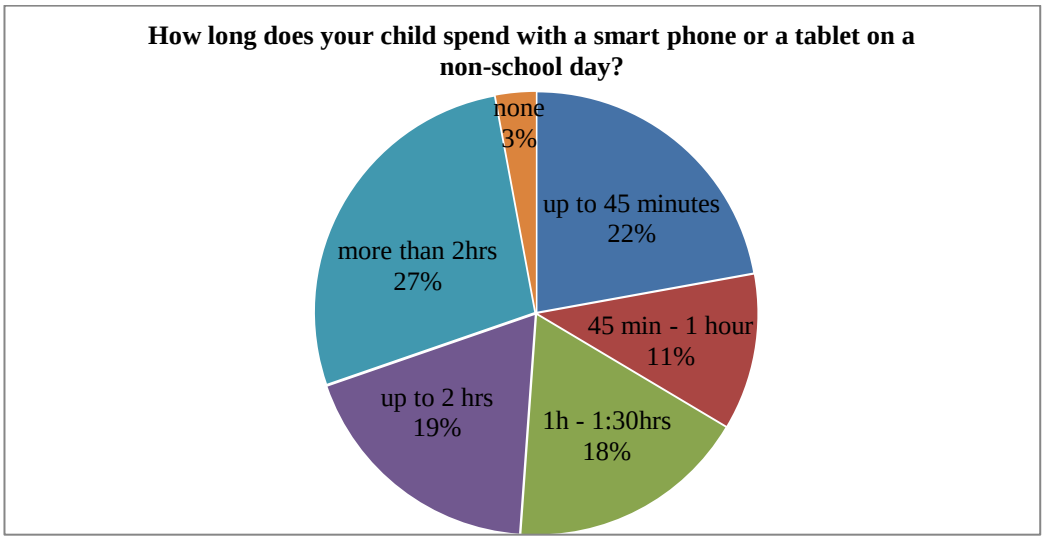


Chart 8: Average time children spend on their digital devices during non-school day



This suggests that, overall, the children analysed in this study, engaged regularly with digital devices. This leads to a number of questions related to this thesis. For example, what do these children do with and on these devices? Do they make things using their devices and what kind of things? How their parents interpret such use?

Parents' responses with regards to the nature of their children's main activities with their digital media devices can be summed into two:

(1) Regular use (at the time of the interviews and the survey) including use assigned by school; and

(2) Sporadic use.

Only those activities that the parents, in the case with the survey, and the children, in the case with the personal interviews and the focus groups, have named, described, and recalled, are considered as use in this research. Therefore, what the children

have tried once but have not managed to recall the type, name, or anything specific related to that activity during the interviews was counted as one-off activities. For example, many children and their parents, equally, said that the children's digital tablets contained numerous apps that were downloaded but never opened. When the names or the nature of these apps could not be described such examples were omitted for analysis. However, this also suggested that availability did not always lead to use.

5.3. PARENTS' PERSPECTIVE: REGULAR USE

Relatively regular use is meant to include what the children did more than once for the past six months at the time of this research. According to the interviewed parents (chart 9), the majority of the children watched videos on the Internet such as on YouTube (53%) and played video games (52%). Other regular activities included creating virtual worlds such as on Minecraft (42%), listening to music (42%), searching for information on the Internet (37%) taking photos (35%), drawing using draw/paint programs (36%), and watching others play video games on YouTube (34%). Around 30% of the respondents (chart 10) said that their children used their tablets to practice basic literacy and numeracy (30%), to look at photos (31%), to read books (29%), and to browse the Internet (29%). Only 12% of parents said that their children used apps such as Fashion Story, Stardoll, Fashion Icon, for style creation. Augmented reality, creative production – using apps such as First Camera, Video Star – and making collages were activities only few children engaged in (chart

11). None of the parents said that their children used their tablets to create comics, movies, music, or run a blog, create podcasts or other types of audio production.

Chart 9: Which kind of app has your child used the most in the past six months?

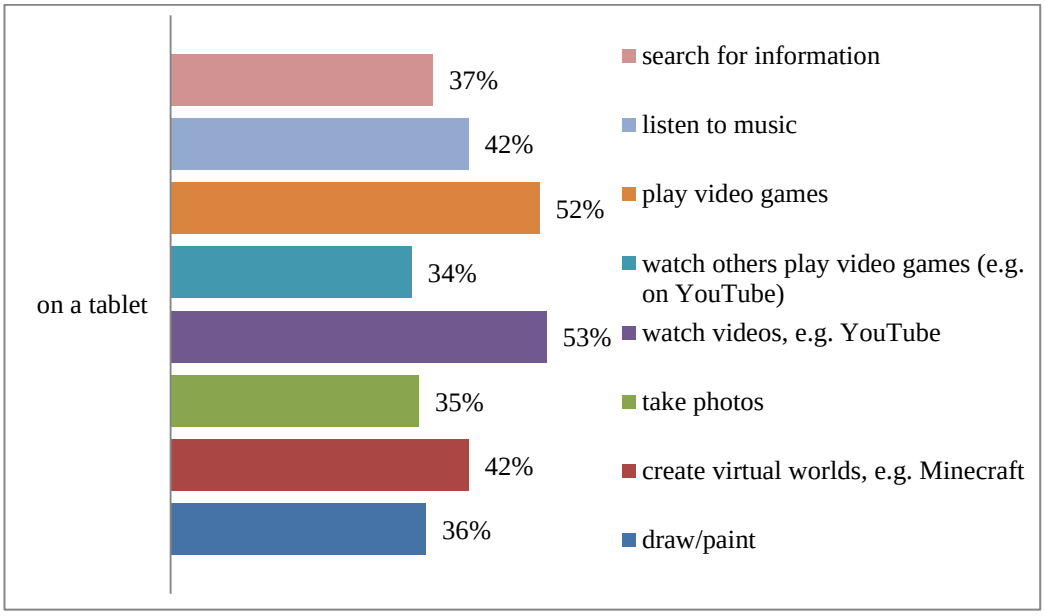


Chart 10: Which kind of app has your child used the most in the past six months?

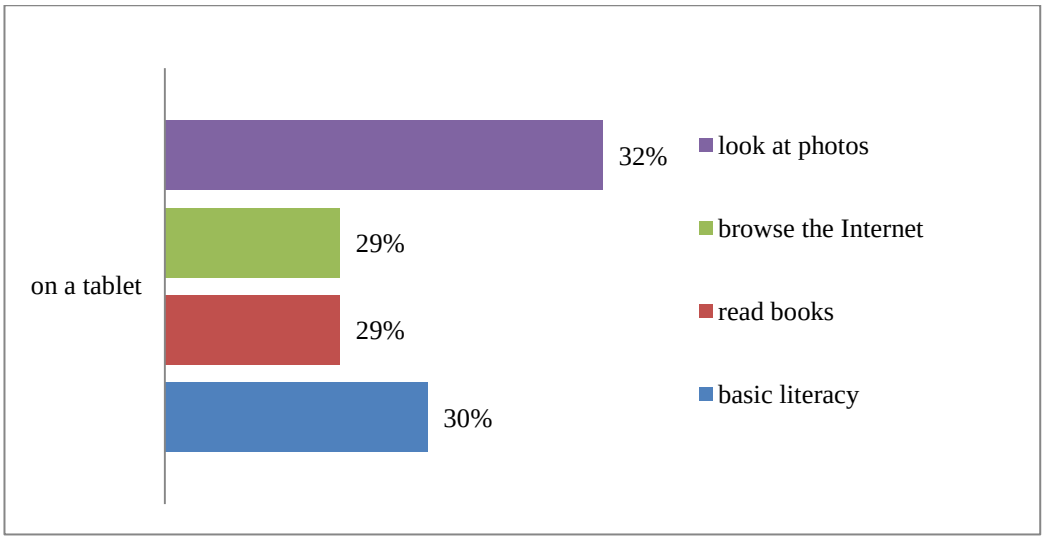
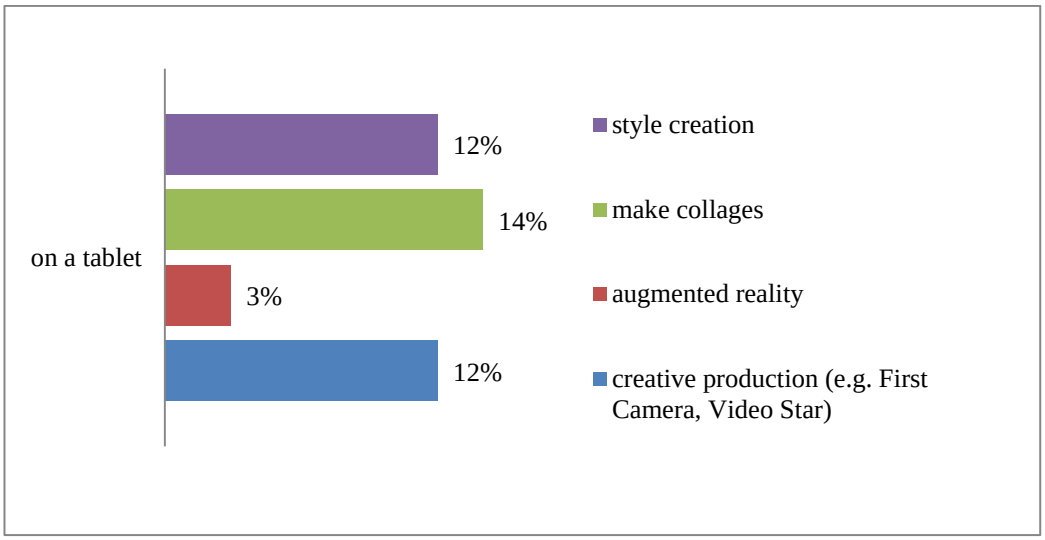


Chart 11: Which kind of app has your child used the most in the past six months?



Charts 9, 10 and 11 demonstrate that children's engagement with digital devices was, overall, versatile. The studied children in this thesis seemed to use their tablets for a range of activities from consumption of audio-visual content to browsing the Internet and searching for information to building virtual worlds using Minecraft to practicing basic numeracy and literacy. On the other hand, being creative – by making and constructing new ideas and projects did not come across as a regular activity.

The 48 parents who were interviewed in person were asked to elaborate on the question of fostering creativity through the use of digital media devices. In addition, these interviewees were also shown a list (Appendix D) of various applications that allowed a user to create things such as draw, make videos, comic strips, books, podcasts, blogs and so on. The interviewees were asked to indicate which apps they were familiar with and which ones their child may have tried or used during the past six months. This was done with the purpose of understanding further about the engagement of their children in any kind of creativity when they used their digital media devices.

When it came to the drawing apps, nearly all of the 48 interviewees pointed to Drawing Pad or Doodle Buddy, Princess Colouring Book and My Colouring Book as the familiar apps. Others that related to creating storybooks, comic strips, audio and music production, filmmaking or blogs were not known. The list of apps that was shown to both the parents and the children in this study was selected from popular reviews found online (www.commonsensemedia.org; www.igeeksblog.com). While the compiled list was not exhaustive only Drawing Pad, Minecraft, Hair Salon, the Toca Boca series, and Doodle Buddy were recognised in general by parents.

Creative development such as making collages, designing fashion, video or audio production, comic strips, storybooks, or any kind of coding video games was not an activity any of the children engaged in. The majority of the parents selected three main activities that, according to them, their children engaged in regularly. These were:

(1) Watching videos such as on YouTube (53%)

(2) Playing games such as strategy and sports (52%)

(3) Creating virtual worlds, such as on Minecraft (42%)

Most of the personally interviewed children in this study confirmed the same three types of activities as their favourite and most common ones they engaged with typically.

5.4. THE PARENTS' PERSPECTIVE: UNCOMMON AND SPORADIC USE

By "uncommon" or "sporadic" use here it is meant two things. First, very few parents reported that their children used their digital devices for certain types of activities. In other words, some activities were less common than others. Second, the parent – and, on separate occasions, the children, too – were asked to name those activities that have been tried sporadically or just once. For example, many children said that they downloaded numerous apps just because they had heard from friends or because they had come across them by browsing the app store, a digital distribution platform for software applications (Viswanathan, 2016). The children would have tried these once and not reused them again. An eight-year-old boy from a church school has put it this way:

> I don't even know what I have on my iPad. I've got

> hundreds. I'd just download them and then … I forget what I have. I've got pages of apps and have no clue what they are. I don't really use any of them.

This statement resonated with many other children – both boys and girls – across all backgrounds. The interviewed parents have responded similarly. A mother of a boy from a government school said this about her son's sporadic use of apps:

> He downloads them all. I don't know what he plays…they change all the time. Different one today and tomorrow and then…Sometime he plays one many times. Angry Birds and…aw, shooting games and cars on his Play Station, he likes. But his tablet is full. But he plays one or two only.

Augmented reality is technology, which can modify real life settings by enhancing it with computer-generated sight and sound (McKalin, 2014). As chart 11 previously shows, applications related to such technology can include style creation among other applications. These allow the user to design clothes, dress up pets, dolls or various characters; design and style hair or make collages. Such activities could count as sporadic activities. Activities that most children never engaged in were apps related to creative production such as creative writing, making interactive books, storybooks, comic strips and so on; audio-visual creation such as music, movies, or podcast-type of audio recordings; and other content creation such as blogs.

The parents of Mark, a nine-year-old boy from a private school, were interviewed

together and individually (Mark – in his school and the parents via email exchanges and a home visit). They discussed the sporadic use of digital devices at their home. The mother reflected that, as parents, they allowed their son "to explore and try things out" although she admitted that her son has not had much time.

> We don't have any rules about technologies so much. He just needs to do his homework. He's so busy during the day anyway that there is no time for anything. He has his Apple computer. He even went camping last year and took it with him and I know that he was naughty and saw stuff…He just doesn't have much time for anything else really. He's got tennis, and golf, and swimming, and football twice a week, tournaments, competitions, training, then school stuff... It's really hectic during the week… Sometimes he comes home so late and he has to start doing his homework.

At the time of the interview and the visit to his home, Mark also went to golf, tennis, football, sailing, basketball, swimming and a number of other extra lessons that he attended to during the week. His schedule, according to the parents – his mother has said "I'm just chauffeuring him from one thing to another" – seemed to preclude him from doing much else. His digital media use has remained largely with trying out and knowing about a number of apps and games – "when he has time, he plays games mainly". Being home late and busy managing school life and extra curricular activities seems to have affected how much and what for Mark typically used his digital devices, which, according to him and his parents, included YouTube videos,

playing or watching others play Minecraft on the weekends when there were no tournaments. Mark expressed his interest in downloading all kinds of games and apps that friends at school may have commented on:

> I don't really have any time for any of that. I've tried Scratch, yes, I know it. Our ICT teacher showed it to us. I even built my own game – it was a project we had to do. I think I still have it. [He demonstrates] it's not really finished yet. Other than that, I haven't really tried anymore. I don't know…I just don't have time.

Mark has explained that the reason why he has not had more time to explore other possibilities on his digital devices – Apple computer, iPad, or iPhone – was because of his "too busy" schedule. The issue of big schedules – school-related and extra curricular activities – for seven- to ten-year-old children has been a recurring element throughout the conversations with the children specifically. More prominence of this factor follows in the discussion and conclusion section of this chapter. Here it has been relevant to say that while devices and applications may be available, many children have not been able to explore them perhaps more continuously and with certain depth, and do much else beyond downloading or owning them. This also leads to an argument that accessibility does not have to be a defining factor to foster creative production. Fairly recent arguments have sprung on a similar vein (Organisation for Economic Cooperation and Development, 2015) taking public media to debate whether technologies in school do or do not improve pupils' results (Coughlan, 2015). The OECD report, for instance, concludes that "no

appreciable improvements in student achievement in reading, mathematics or science in the countries that had invested heavily in ICT for education" (Organisation for Economic Cooperation and Development, 2015, p. 3) with reference to 15-year-old children. The availability of the tools – computers in the classroom or hundreds of apps on their tablets – may not change or improve learning. *How* technologies are put to use makes all the difference, which is always the crucial element. Moreover, others argue that such reports as OECD's tend to be too narrow in focus (Berry, 2015). OECD's report, for example, has excluded to capture more creative work with digital media devices such as photography, audio-visual and text content production (Berry, 2015). Such aspects involving creativity are usually harder to measure and assess (Rubenson and Runco, 1992) and therefore have had no presence in the OECD report. This leads to the conclusion that creative production through digital media devices requires definition and equally a model for enhancing such activities among children, the way attempts have been made to develop methods for evaluation and assessment of creativity-oriented learning activities (Ott and Pozzi, 2010).

As this section has looked at the parents' perspective, it is relevant to add that many of the interviewed parents have seen such 'browsing' through the multitude of apps and trying out one or another type as "waste of time" or "distracting" and "leaving children in cyber space" – overall, something that is negative. For example, the mother of a ten-year-old boy from a church school has been proactive at removing whatever her son has tried to download in her effort to keep him out of distractions.

> I try to avoid letting my children use digital devices. Won't buy an iPad. I see what they download on my mobile and delete it. From time to time I change the game. I don't download apps. They do and then I uninstall them. It's ok to play these games but during school they can't just keep playing games. They're [digital devices] too distracting because it makes them think that everything is like the games. And it's not like that.

Contrary to the parents' views, the children have expressed different views. Many have regarded the availability of an abundance of applications and games on their digital devices as some form of liberation, as a place of exploration and surprise. Most children have discussed having so many apps on their digital devices as if it were some competition about who owned the most apps. One may argue that this 'browsing' and 'hopping' from one activity to another may seem wasteful. On the other hand, such experimentation could also count as exploring the world at one's fingertips – children are simply curious about everything but so many legal restrictions outside of the realm of their own digital device would preclude them from ever exploring.

5.5. THE PARENTS' PERSPECTIVES: PURPOSE OF USE

The main reasons why the surveyed parents in this study allowed their children to engage with their digital devices were (chart 12):

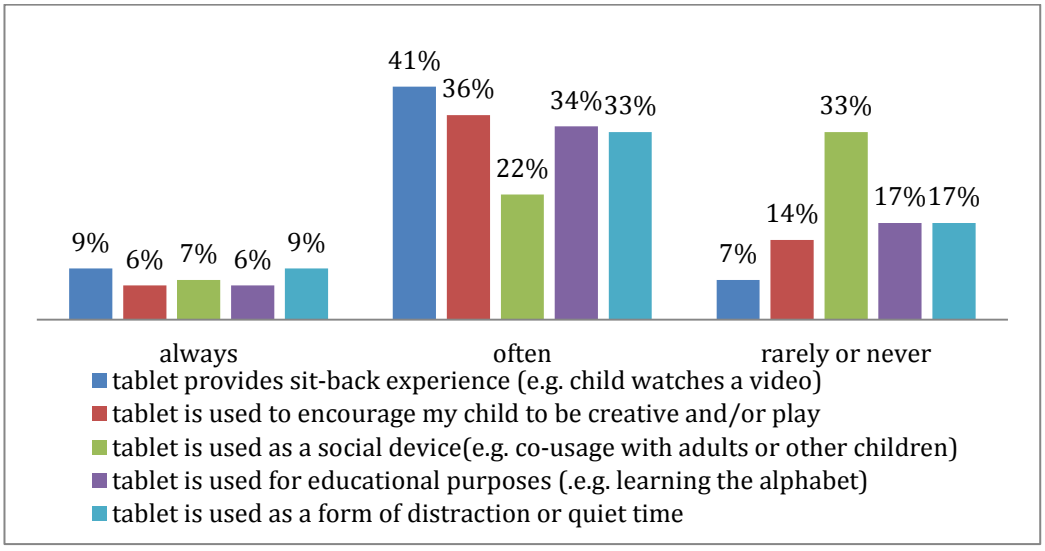
(1) Digital devices provided sit-back experience, such as the child could watch a video (41%);

(2) Digital devices were used to encourage the child to be creative and/or play (36%);

(3) Digital devices were used for educational purposes such as for practicing the alphabet and numeracy (34%); and

(4) Digital devices were used as a form of distraction or quiet time (33%).

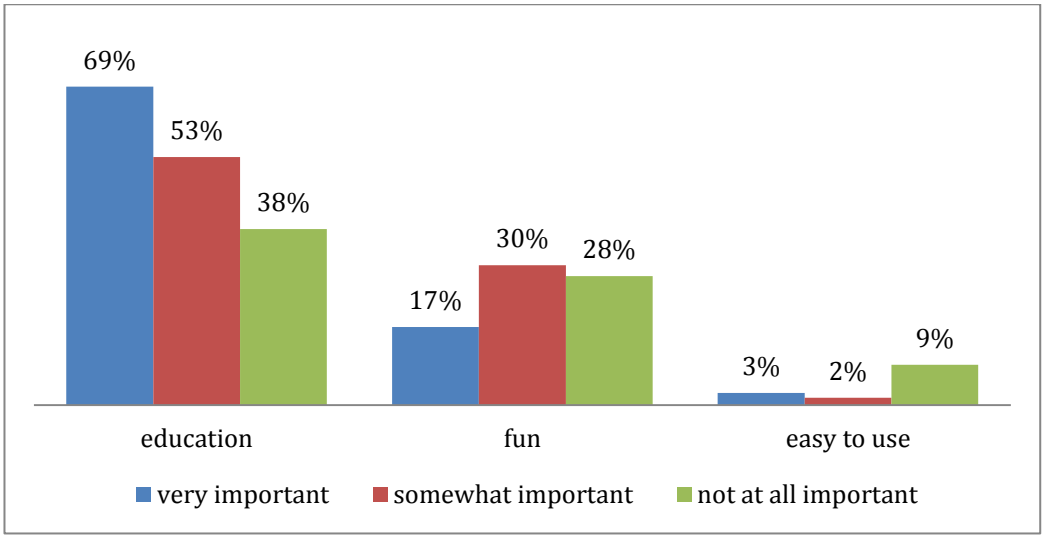
Chart 12: Rate how often the following situations are true:



The majority of the parents, as seen in the survey, and from the personal interviews with some of them, said that an education-related activity was very important (69%) or somewhat important (53%) as a feature they looked for in an app for their children

to engage with (chart 13).

Chart 13: The most important features I look for in an app for my child's tablet are:



From personal interviews, some parents did not see some of the games their children played as educational or creative. For example, Toca Hair Salon – where players cut or design their own hair after they take their own photo and apply it to the app's main window – My Restaurant or Fashion Icon were not deemed educational or creative, but mainly games for entertainment. It seemed that some parents distinguished between games for entertainment and games for educational purposes, while an activity on a networked device can be both of those things. Furthermore, the way parents categorised games and apps seemed to navigate their decisions with regards to what their child would download and use. For example, the mother of a seven-year-old girl from a government school said that some apps her daughter liked were just "for fun". Educational apps involved tracing letters, spelling and similar.

> She likes the fashion and modelling…and there's another

> one, Fashion Icon – that one she likes a lot. The fashion one…you dress up the person, she takes pictures then sometimes…but they're just for relax after school…for educational is very important. Like, practicing spelling. There is also to trace the letters. They're like games but they're very educational.

Other parents made a similar dichotomous distinction of use. The digital devices served their child to either deliver "fun" or support education and learning. However, 'fun' and learning do not have to be separated (Kervin, 2016; Resnick, 2004 and 2014; Russ, 2003). The connection between play – fun – and learning, and play and work goes back to the view on the "ideal mental condition" that requires "open-mindedness" and "to be playful and serious at the same time" (Dewey, 1910, p. 232). Moreover, playfulness and creativity have been used as methods of learning (Ejsing and Skofbjerg, 2016). This is not to say that parents denounce children's playful use of digital media devices. In fact, 17% of them also reported that "fun" was a very important feature when they chose apps for their children (chart 13). However, during conversations with parents, some seemed to compartmentalise activities under "fun" and activities under "educational" when an activity could be both (Dewey, 1916). This poses the question of whether some parents were generally aware of the wider possibilities of digital applications and their educational affordances that do not necessarily involve the practicing of numeracy and literacy skills. As, for example, My Restaurant, Fashion Icon, taking pictures, or the FIFA series games, can claim their educational value, supportive of research that has also acknowledged the significance of informal learning (Sefton-Green, 2010).

If parents were to view a purposeful use of digital media devices mainly when their children practiced school-related activities such as maths and reading or writing then this could potentially pose limitations to children to see the wider scope of these tools as research has shown that parental involvement and attitudes toward various subjects can influence their children (Epstein, 1983; Zdzinski, 1996; Clark, 1983). The same can be said then for what parents may or may not consider as creative production when using such apps that may have further influence on what children would eventually be encouraged to use.

5.6. THE PARENTS' PERSPECTIVE ON 'CREATIVE' USE

Three points have surfaced after the survey and interviews with the parents for this thesis. Firstly, parents seemed to express an imprecise understanding of what they considered creativity and creative production through digital media devices. Secondly, their preference for "educational" use was predominant above other reasons for use of digital media devices. In relation to that, parents had the tendency to group use into major groups, for example "playing games" or "watching videos" or "for educational purposes". And thirdly, parents seemed to relate creative production and use mainly with crafts-related activities.

In general, the survey results and the interviews lead to the overall understanding that parents, like their children, reported similarly with regards to their children's use

of digital media devices. However, when it came to perspectives of what activity was considered creative and would lead to making creative things, parents and children tended to report differently. For example, to parents "educational" use was very important while creative production or creative use in general was a less clear concept. With regards to creative production most gave one or two examples to support their perspectives of the concept. The most commonly quoted examples during the interviews were Minecraft, drawing and painting apps.

> I search for educational apps or at least not the same repetitive games that you just shoot or jump to collect points. There are some good educational apps that are also entertaining…he plays this game to do spelling and then as an award the app gives him some game to play before the next word comes up…And then he likes Minecraft, which is very creative and, you know, he plays, yes, it's a game, but at least he's creating something which is important. (Mother of a ten-year-old boy from a private school, age 35-44, business owner)

To children, on the other hand, creative production meant many other things that parents did not necessarily acknowledge or know about. For example, watching specialised 'how-to' videos on YouTube or searching up pictures on Pinterest or on the Internet in general about how to make things could count as part of a creative production process. More of the children's perspectives follow with direct examples:

> It's like...when you want to build something. Like, I look up videos about how to make my own wooden boat. Vince from my dad's office has all the machines – he can cut everything… I want to find a video to show him so he can cut the pieces for me. Then I'm going to build it myself. (Seven-year-old boy from a private school)

> I want to make Titanic out of Lego…I look up photos on this app. Yes, Pinterest! My mom has it. Yes, it's true [another boy during this particular focus group tells him that Titanic already existed so "it's not going to be original"]. But mine will be out of Lego…they didn't make it out of Lego! (Eight-year-old boy, private school)

To other children creative production also meant dress-up and fashion-related games and also taking pictures or videos of themselves, siblings or friends performing, for example, singing or dancing or imitating a famous music artist (as some children have mentioned). To a nine-year-old boy from a government school creative production was also how he personalised the screensaver of his tablet. A nine-year-old girl experimented differently:

> Sometimes I put them [videos] on YouTube. So I film my mini dollhouse and then I put that video on YouTube. (Nine-year-old girl, private school)

While many parents sought “educational” activities to, perhaps, justify use, to many of the interviewed children “educational” meant, “boring”. Specifically, many of the personally interviewed parents did not consider playing video games or watching others play games online as educational, which is not necessarily the case (Fralinger and Owens, 2009; Everhart, 2009; Gee, 2007). Education as a motivation to use digital devices was a choice to many of the parents when they were asked to answer which types of apps they personally favoured and which ones they thought were their children’s favourite (chart 14 and chart 15).

Chart 14: Of all the different types of apps your child uses, which ones do you like the most and which ones do you think your child likes the most?

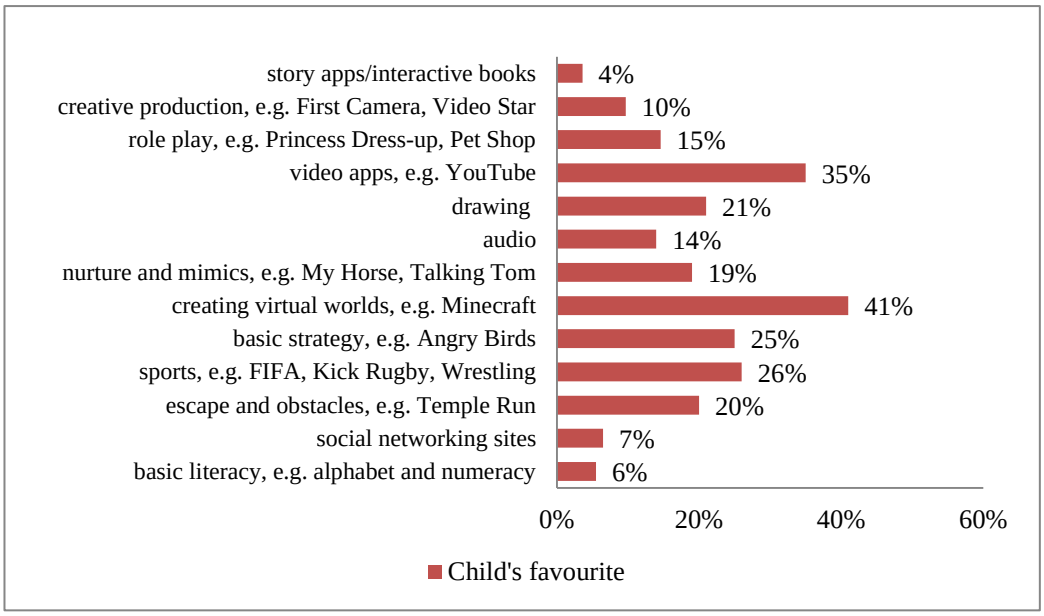
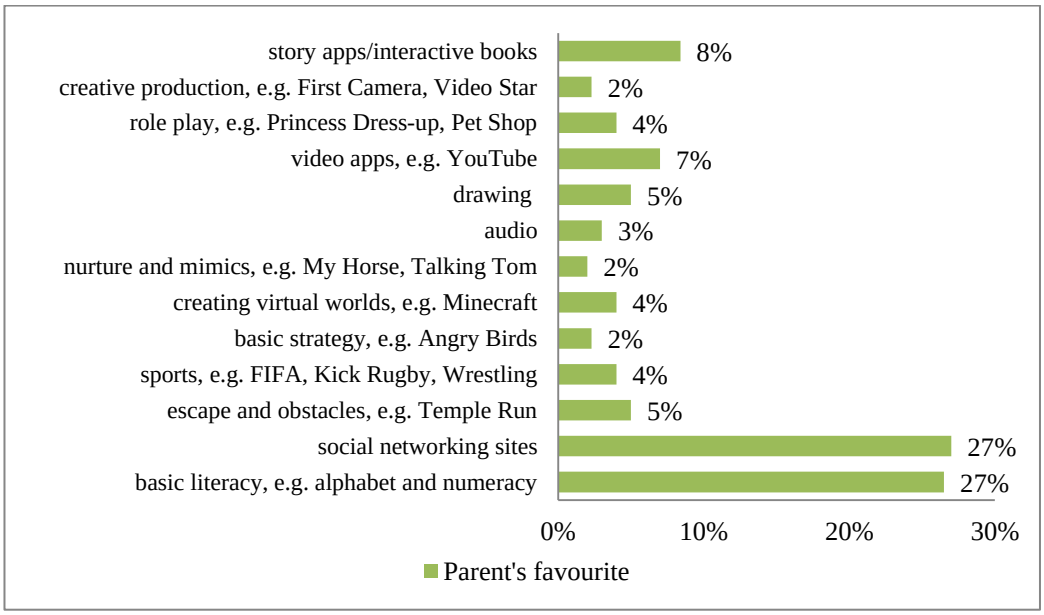


Chart 15: Of all the different types of apps your child uses, which ones do you like the most and which ones do you think your child likes the most?



Parents seemed to acknowledge that basic literacy apps were not their children's favourite as is evident in the survey results (chart 14 and chart 15). Five per cent of the children favoured basic literacy apps according to their parents, against 27% of the parents who favoured them. During the focus groups and the personal interviews children openly expressed their dislike of such apps related to literacy and numeracy.

Many parents, it seemed, related creative production with digital media devices to mainly one or two activities – building virtual worlds such as on Minecraft and using drawing and painting apps. Some also linked creativity with basic literacy and numeracy practices. For example, when asked what their children did that was considered creative some parents responded that it was usually something to do with education. Making this link then took many of them to swerve back to examples with apps related to numeracy and literacy or playing Minecraft. Moira, 38, the mother of a seven-year-old boy from a church school welcomed such "creative use" of digital media devices as it gave an alternative, to her son, to the pen and paper practice, making maths more exciting.

> Moira: The games he plays on the tablet are very creative. He is doing maths so he's learning but at the same time he's playing.
>
> Researcher: Don't their books still offer games-like exercises to practice maths?
>
> Moira: Yes, but these have the sounds and … and it's different. I can see him more enthusiastic now than before. When he has to write with pen and paper it's not the same…it's good that they'll bring these tablets to school because the children have to learn how to use them. It's the future.

The games this mother refers to as "creative" surely demonstrate the creative person

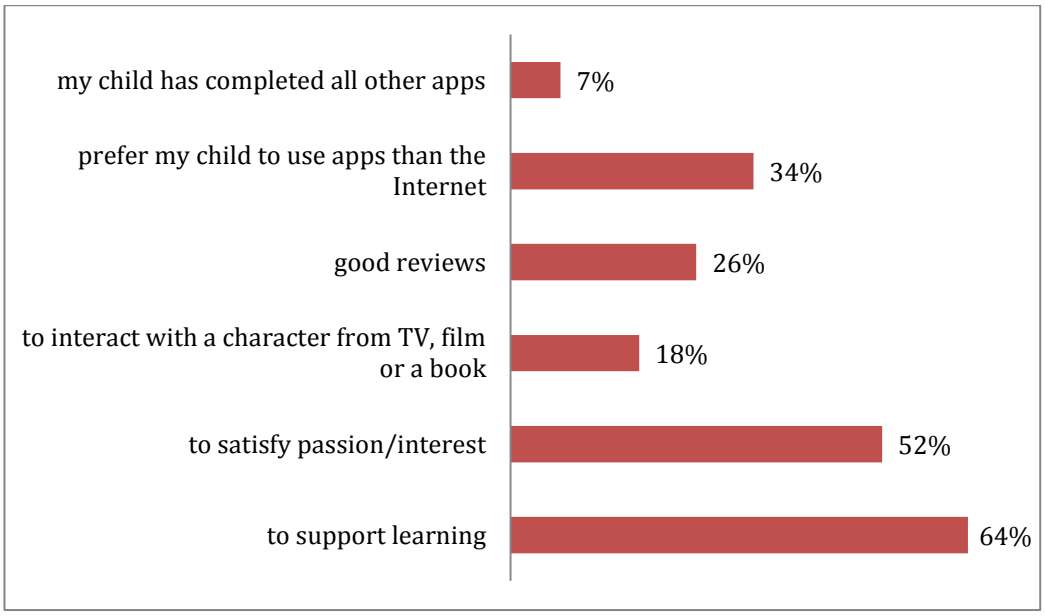
who developed them. However, these do not necessarily ask of the child who uses them to do anything creative with them, a distinction that this parent does not seem to make.

On the one hand, it looks encouraging that some parents relate creativity to education. Creativity has become core in education in general (Craft, 2005; Shaheen, 2010; Harris, 2016). Educational policies across the world have revised curricula to fit in methods to foster creativity (Shaheen, 2010). The concept has also been included in the national educational strategy of Malta (Ministry for Education and Employment, 2014). Many of the interviewed parents agreed to the importance of fostering creativity. On the other hand, however, many parents did not give details on what creativity entailed with regards to their children's use of digital devices. Also, the majority linked education – and learning in general – with basic numeracy and literacy in light of the much broader learning and educational experiences digital media devices can provide (Marsh et al., 2015; Raths, 2015; Ott and Pozzi, 2012; Ohler, 2013).

Many parents also viewed the use of digital media devices as a source of fun and play. Chart 13 previously and chart 16 below show what many parents looked for as the most important features when they searched for an app for their child's digital device and what they felt motivated by when they decided to purchase or download an app. The charts show that nearly half of all respondents – 17% and 30% – found "fun" as, respectively, "very important" or "somewhat important" feature they looked for in an app (chart 13). More than half the parents, 64% of all respondents,

downloaded or purchased an app to "support learning". More than half, or 52%, also said that they did so to satisfy a child's passion or interest (chart 16).

Chart 16. What are your motivations for downloading an app for your child?



On the one hand, alongside education as "very important" feature parents looked for in an app may suggest that they perhaps made a correlation between "education" and "fun" and between "support learning" and "satisfy passion/interest" unlike many of the interviewed children. On the other hand, such replies may reflect parents' intentions to find a balance between what they personally favoured and what they believed their children might have preferred to use. It is understandable that parents want the best for their children – insisting on educational use while also satisfying what children may consider "fun" use that parents might not. In general, the interviewed parents acknowledged the importance of play and insisted that digital media devices were great tools to provide fun experiences. However, fun and play seemed rather dubious concepts when many of the interviewed parents were asked to elaborate with their own examples. While some found playing video games as a

positive activity as long as it was controlled time-wise, others went on to change their minds by rethinking how children needed to play outdoors and socialise more in person. Again, such clashing viewpoints suggested that, overall, parents were aware of the wider concerns public media have publicised with regards to screen time (Wakefield, 2015; Janis-Norton, 2017). And because such claims are still largely contentious and inconclusive (Livingstone and Sefton-Green, 2016) more discussions regarding that must reach parents.

Related to the importance of fun and play a common presumption seemed to exist among the interviewed parents that their children used their digital devices mainly to play games and playing games could not take place often during school time. Therefore, parental mediation regulated the time their children spent with their devices. The interviewed parents expressed their perceptions that digital devices equalled playing games. A mother, aged between 35-44, working at a mid-management level, said this about her ten-year-old son who studies in a church school:

> Digital devices are cutting out children socially and leaving them in cyberspace. They are detached from reality, society our own environment. I try to avoid letting my children use digital devices. Won't buy an iPad. I see what they download on my mobile and delete it. From time to time I change the game. I don't download apps. They do and then I uninstall them. It's ok to play these games but during school they can't just keep playing games. They're [digital devices]

> too distracting because it makes them think that everything is like the games. And it's not like that.

Another mother, within the 35-44 bracket, employed at a mid-management level, said this about her seven-year-old daughter who studies in a private school:

> They are so addictive that I must make a conscious effort to stop the use of these devices once I think my daughter has spent enough time on them. Mainly the weekends but otherwise she's only playing games after games and it never ends. Then the books are obviously suddenly so dull and boring and it becomes a struggle to make her read and write.

In their descriptions of recurring activities, it seemed as though parents perceived digital devices as games consoles. Such an assumption seemed to correlate with time restrictions parents imposed on their children. However, when parents deemed the use as educational they were more encouraging and allowing their children to use the devices. For example, some of the parents said that Minecraft fostered creativity and therefore they encouraged their children to play the game. Other parents discussed openly that they were finding it problematic to find the time to search for apps and games that could foster creativity and support learning. A parent said that she hoped that schools would eventually propose some ideas.

> There is little education about content on mobile apps and Internet. Both in terms of security and in terms of variety of information, source of information etc. etc. I don't know what's good and what can support him educationally or creatively. Creativity is so important today and we have this thing and he has no idea and me neither. Minecraft is good I guess but what else is supposed to help him be creative? (35-44-age bracket; senior management; mother of a nine-year-old boy studying in a church school)

> They are good source of learning but sometimes they are addictive and they waste time. I look up customer reviews to find which is best for education and but [sic] that isn't always possible. And then I have to try them out myself and otherwise I won't know for sure if they are good. It would be nice now the teachers to tell them what is good to use at least they will know how to put the iPads in better use. (The mother of a ten-year-old boy from a church school; 25-34-age bracket; 'entry level' employment)

Overall, many parents expressed clear understanding that their children experimented with various functionalities of their devices – that children took pictures, which could count as a creative act. Yet, parents did not mention taking photos or making videos as a creative production that their children engaged in. Only after prompts from the researcher, such as, "how about taking pictures?" or "has

your child made any videos using the tablet or a smartphone?" did they consider that such activities, too, could count as something creative their children did. Creativity according to most interviewed parents generally related to artistic expression – making crafts. One parent further complained that she was not interested in the kind of creativity where teachers decided and even designed all the projects, leaving no room for the children to decide creatively what to make.

> I'm tired of my daughter bringing silly cards at home – for Mother's Day, for Christmas…It's ok … the thought of it…But it's just that the teacher chooses the design…the cut and she just glues the stuff, like everyone else in class would have done the exact same things. It's so obvious that my daughter didn't do it. She brings these cards home and I toss them right into the bin. I don't want this kind of rubbish. That's not creative. I don't see why they don't let the kids decide what to design…I don't need her to do crafts all day…[The eldest daughter] was reading proper literature back home [the family is from UK, living in Malta]. They used to read poetry. She's now back to picture books … (Mother of a seven-year-old boy, and two four- and nine-year-old girls, private school)

This is perhaps why so many of the interviewed parents linked the use of draw/paint apps whenever they were asked a question related to creative production. Another suggestion is that parents also gave importance to the educational side to digital

media use seemingly to justify such use especially in light of the fact that many parents were also concerned with screen time, social isolation, and other possible negative effects that concerned them.

While many parents seemed to relate creativity with crafts it must be pointed out that this is not about how many apps the parents knew that had to do with creativeness or creative use or production using digital devices. The list of apps and games to encourage those who like crafts or anything else for that matter is perhaps endless. New apps of all kinds are developed all the time. However, there seemed to be a general lack of awareness of the wider list of things that children could make, create and develop using such tools. This pointed rather to a general lack of diversity and of detail with regards to what creative production and use may mean to parents and also, what creative production may mean to their children.

Most parents seemed to perceive creative use of digital devices as 'alternative' use. The most commonly encouraged use remained relatively directly related to school – basic literacy and numeracy. It was deemed creative when children practiced such skills using their digital devices. Creative production led to common discussions about building virtual worlds on Minecraft, nothing much else. How parents framed the concept of creative production through digital media devices could potentially pose limitations on use itself.

If parents are unaware of the positive experiences their children may enjoy could ultimately lead to restrictive mediation. Restrictive mediation then can lead to limited opportunities (Livingstone and Blum-Ross, 2017). For example, lumping together experimenting with comic strip writing, making videos and having a blog,

or even looking at images to figure out how to build Titanic out of Lego pieces under one common denominator, such as "using apps for fun" or "playing games", can lead to unfair rules and ultimately restricted use. On the other hand, restrictive use – lack of opportunities for creative production or even simply creative exploration – may become as a result of the unclear idea of what creative use and creative production through digital devices might actually entail.

Such scenarios should suggest that where efforts are being put to bring up digital media literacy for children (Craft, 2005; Shaheen, 2010), the same could be proposed to address parents.

5.7. THE CHILDREN'S PERSPECTIVE: CREATIVE PRODUCTION AND USE

While both children and parents, on separate occasions, agreed, overall, on the type of digital media use, rules and restrictions, there were discrepancies between the two generations with regards to personal experiences and perceptions from engaging with digital media devices. Specifically, what children considered creative production and creative engagement with their digital devices seemed to be not so visible or acknowledged by their parents.

This section begins with the main differences that surfaced from speaking to both parents and children. There were a number of differences in the responses that parents and children gave with regards to children's (1) favourite activities and (2)

creative production when using digital media devices.

One difference related to what was considered "educational" use of digital media devices. As discussed previously, parents seemed to connect "educational" with traditional form of practices that focus on exercising basic literacy and numeracy skills, as well as mathematical operations through the use of various game-like activities. Therefore, if the activity that a child engaged in on a tablet involved practicing such skills it seemed to be understood as educational as well as creative – because it was not the typical "paper and pen" based practice, as one parent had highlighted. Ultimately, such activity was worth encouraging according to many parents.

Some of the interviewed children also agreed with this notion of "educational" activity as parents perceived it. While some of the younger children – seven and eight years old – expressed excitement about apps such as Phonics and Sumdog that offered fun way of practicing maths or letter recognition, the majority of the older children – nine and ten – openly disliked such activities. Overall, the majority of the children across all ages did not find such apps exciting as their parents did. An eight-year-old girl from a private school said this about using her tablet for maths:

> I watched the times tables. It's like I watch it before I go to school. It was really just one time, it's just about subtractions and stuff. But I don't really like doing school stuff with the iPad. It's boring. (Eight-year-old girl, private school)

Another child from a private school also expressed her opinion of educational apps:

> I don't really like using it for school stuff. I like Minecraft, I like as well YouTube. I watch…I like challenges like the Pringle challenge… (Seven-year-old girl, private school)

Many children showed how they pursued personal interests, hobbies or curiosities by using their digital devices. Most of the interviewed parents did not seem to recognise such use. This highlighted yet another major difference between children's and parents' perceptions of creative production and use through digital media. Children, interested in a particular field – for example drawing, animals, nature, construction, medicine and so on – used their devices to support such interests. An eight-year-old girl from a government school, mentioned earlier, looked up medical conditions:

> I look at people like who have conditions, like when they have Down's syndrome. Because I'm really fascinated because when I grow up I really want to help people that have these types of conditions.

Those drawn by artistic expression showed how they used their digital devices to pursue their interests:

> On YouTube there is [sic] many videos and you write how to draw…a car and you copy it. Sometimes I copy it exactly.

(Ten-year-old boy, church school)

> There is the tablet [sic], for example, a game that gives you step by step how to draw a superhero. I copy it, but then when I've learned to draw it well, I draw again but different ones, of my own. (Nine-year-old boy, church school)

This example is a reminder of the sociocultural perspective that learning takes place as a result of the interaction of children with their environment. On the other hand, it also demonstrates how the two boys used the digital devices to serve their passion for drawing. This is to say that, led by personal motivation children exerted agency over their digital tool. The academic, pedagogic and parental efforts therefore should focus on how to cultivate and even follow such motivations.

Some children said that they found use in their digital devices when they were personally faced with a problem directly related to school.

> For example, how to make a full circuit that I needed for science, I had to do for school, I went on YouTube to see how it's done. (Ten-year-old boy, government school)

> I go on YouTube because all my PS3, when I get stuck on a part, I go and see how to figure out the problem. (Nine-year-old boy, government school)

> If I have a problem like a division of division of division I search for methods; on YouTube lots of videos come on. (Ten-year-old girl, government school)

The majority of the interviewed children pointed to their favourite activity of taking pictures and making videos as a form of creative production through the use of digital devices. While parents acknowledged this regular activity, many of them did not specifically recognise it as creative production, seemingly finding such regular activity as an everyday situation, rather than a unique act of creativity. This calls for reflection over what creativity is supposed to mean when it comes to children, aged seven to ten. Everyday creativity to children certainly may include taking selfies or even making a funny video of their brother sleeping (as one of the interviewed children described). To parents creativity may be regarded differently as it begins to show. However, such differences must be acknowledged in order to avoid cutting out on opportunities that children may gain from using their digital media that stimulate their interests and ultimately their creativity.

The most common picture taking that many children said was 'selfies'. A ten-year-old girl from a private school said this about her pictures:

> I have millions of photos everyday and I delete millions of photos everyday and my iPad can get stuck with too many photos so I deleted them after I take them…My friend and I we like taking photos of each other because I live in Qawra and she lives in Naxxar and because we don't see each other

> everyday we take photos of ourselves and we send them to each other. (Girl, ten, private school)

> I take selfies. I show them to my friends, I keep them. I like some photos and do wallpapers [on his computer]. (Boy, ten, government school)

A ten-year-old boy from a government school said that he was taking photos to help him in his game playing:

> I can take photos and then I use them for the skins I create on Minecraft and there I can change photos. And the second thing is, you can take screenshots of what I build on Minecraft. Then you can look what you've built. I like looking at my screenshots and also if I delete a map I like to go back to my screenshots and see what I have done.

These examples demonstrate children's creative production when using their digital devices on a daily basis. Reality and everyday things, situations, people and places seem to become an active material encouraging many of the interviewed children to capture, manipulate, communicate with, on their own terms, in their own ways, and, in a playful manner.

> When I put photo on my tablet you can like change faces and change sort of the look of it, add things on the photo to make

it look funny. (Boy, eight, government school)

A boy from a private school has put the camera of his digital device into a different use. Because, as he explained during the interview, his parents worked full-time from home they rarely, in his words, sat with him when he had to prepare his homework.

> Sometimes I send them pictures and videos. After I've read I have to talk into my iPhone and explain what I've read and then I send it to my father so then he can hear what I've understood from what I've read. I sometimes record it. I make a video or just take a picture of the page and then send it to him. Well, it is basically so I can improve my communication.

Perhaps previous generations would not have thought of externalising random daily occurrences – the tools available to them perhaps did not afford accessibility or simplicity of use – the way children today do, as the interviewed children have explained. The ease of use of technology has encouraged many of the interviewed children to experiment with photography and filming daily. As young as seven, children demonstrated 'an eye for' capturing something in a frame of pixels and colour; an interest in making a video to show and tell their friends or siblings; the curiosity to upload on a public domain where others could see – a reminder of the importance of audience to creativity (Gauntlett, 2011, 2015).

> I take pictures and videos on YouTube and Google. I'm allowed to. (Girl, eight, private school)

> I post photos of different things I like. (Ten-year-old girl, government school)

This nine-year-old girl from a private school has investigated further opportunities, not specifically related to sharing and posting photos or videos:

> Actually, there is this website I go to where you can read stories of other people, it's called Notepad, and then you can post your own stories as well.

Some children have shown how digital media devices have given them platforms, not only to express themselves creatively but also to develop their own personal corner, as it were, to 'meet' their friends when they cannot physically meet. This was especially evident among the older children interviewed in this study.

> I like to take selfies and put them on YouTube. I've done that, I tried but …I actually take selfies or pictures of things I like and then I send them, I use Viber and Skype, or sometimes there is this app you use to collect your photos, it's called Instagram and you can like photos or post your own and like that my girlfriend when she can't come at home now during school time, when it's not summer, and then we send each

> other, we keep photos like that and she likes mine and I like hers and we follow each other and send messages sometimes, it's really cool…because you can chat and it's free like you don't pay money to be on Instagram and then you can see what others are posting too and some of the pictures are amazing. (Girl, ten, private school)

In connection with the above, during a focus group with Angela, eleven, Ingrid, eleven and Tobias, ten, in one private school the following conversation took place, which suggested how the older the children were the more likely they were to look for ways to use their digital devices socially, to connect with their friends.

> Angela: Sometimes I post photos of things like when we're in a restaurant and I take photos of the food or selffies.
>
> Ingrid: She posts photos and videos on. There's this program called Instagram and we post photos there.
>
> Angela: I even post videos. I take videos like and then post them. And you can watch other stuff on Instagram, like really funny videos other people take and post.
>
> Tobias: Why do you wanna watch stuff like that?
>
> Angela: Because it's funny. Because I can and because it's cool … and you can hang out with your friends like, you know? And, like, you have lots of photos you can choose and look at and you can make your own like who you are because of the stuff that you like and then, like, you can dream of these

> things that you see or plan the way you want, what you want to do one day. I don't know. It's just cool and the photos and you can talk about the things that you see and that inspire you like.

Creativity among older children seemed to have a social purpose. Such social purpose seemed to precipitate from a young person's need for connection with others. The creative appropriation of their digital devices served their need to socialise, stay connected with friends. While to an eight-year-old Minecraft could be an outlet to express creativity, thought or imagination to a ten- or an eleven-year-old it was through building an online profile and presence, which they could share with others. A couple of years' difference was associated with a dramatic jump in the purposes and meanings of children's digital media use. Their creative explorations through digital devices seemed to change. This is a reminder of why it is imperative to study small age groups as children's interests and goals vary from one year to the next.

Some of the similarities that surfaced from the survey results, the conversations with some parents and the interviews with the children were related to rules. Rules related to creative production and use of digital media devices in that how parents understood use and creative production was likely to dictate the types of rules they would set and impose on their children as much as their mediation depended on their knowledge and involvement (Salen, 2016; Ito, 2017). The parents' answers with regards to typical time spent during school and non-school days on a digital device agreed with the majority of the interviewed children.

> I have 2 hours to play and if I use one hour only, the next day I can use that hour. (Boy, eight, government school)

> I don't really have time to use it but on the weekends I'm mainly allowed to play games for a couple of hours. (Girl, ten, private school)

Screen time and rules related to when digital devices could be used was widely discussed with both parents and children during this research. While both sides clearly expressed the rules to screen time, there seemed to be an overall emphasis on screen time more than on the type of activity during screen time. To parents, it seemed, screen time was the main issue as it has been a rather hyped concern elsewhere (Mills, 2016; George and Odgers, 2015; Livingstone and Blum-Ross, 2017). Parents expressed their rules succinctly:

> We limit use of devices as much as we can. Currently used to watch movies and educational content only. Otherwise they end up playing games. If I don't control what they do, it'll be games only and that's no, no during school. (45-54-age bracket, middle management; mother of eight-year-old girl, private school)

> He's using and watching…normally he is allowed a time limit of use. It is taken away when he misbehaves. (45-54-age

> bracket, business owner/executive; mother of eight-year-old boy, private school)
>
> Our house rule: no technology before 6 pm; technology is used as a reward – within limited time frame. (25-34-age bracket; housewife; mother of eight-year-old boy, government school)

Combined with lack of time (discussed in the end of this chapter), screen time limitations could limit the opportunities from digital media use. For example, while many parents worried over how much time was good time to spend with digital media, they could check, as Livingstone and Blum-Ross advise (2017), whether their children were:

> Eating and sleeping enough? Physically healthy? Connecting socially with friends and family – through technology or otherwise? Engaged in school? Enjoying and pursuing hobbies and interests – through technology or beyond? (2017, p. 10)

As evidenced earlier in this chapter, children have widely expressed the interests, hobbies and curiosities they often pursue through the use of their digital devices. They create and put their devices into meaningful use more often than it seems to be recognised by those they depend on. Parents, therefore, must be able to recognise children's individual drives before they impose limitations.

Another activity that many of the interviewed children said that they favoured was watching audio-visual material in general and on YouTube specifically. Like screen time rules, favouring YouTube was also in congruence with the parents' responses. Children expressed their fondness for YouTube. An eight-year-old boy from a government school referred to his tablet as YouTube. Other respondents mixed the audio-visual platform in a similar manner.

> When you want to Google something, you go on YouTube.
> (Boy, eight, government school)

> Google is when you want to watch something on YouTube.
> (Boy, eight, government school)

The above leads to the question of whether the children in this study distinguished between websites, platforms, hardware and software. Yet, in their explanations, the interviewed children demonstrated that they could get to what they wanted: If they needed to search for information, they reached out to Google; if they wanted to watch a video clip, they used YouTube, regardless of what they called it. Many seven- and eight-year-old interviewees seemed unclear with some terminology.

> What does technology mean? (Boy, eight, private school)

> What are applications? (Girl, nine, government school)

Yet, some parents and teachers viewed children overall as technically savvy. Similarly, the interviewed parents demonstrated mixed levels of technical knowledge. For instance, those with higher level of employment were more likely to discuss security measures they took to provide safe digital media interaction for their children.

> I have installed Qustodio on every single device my son uses – android, tablets, smartphone, Windows laptop, PC. It monitors all apps he uses. I have set a time limit. I have also blocked certain sites by genre – for example banking, politics, porn etc. I get a summary daily, so that I know exactly what he is using and for how long without being intrusive myself. (Aged 35-44, intermediate employment level; mother of eleven-year-old boy, private school)

Those parents from lower socio-economic background said that time limit and being present when their children used their devices helped to ensure safety. Their description of games and activities that their children engaged in was also generic. For example, instead of naming games or apps their children enjoyed, they referred to them as 'shooting games', "racing cars games", "tpingija" – drawing types – or "hiliet fil-literismu" – literacy skills – or "videos" without recalling names even when prompted with examples. One parent said that her son plays "logħob ta'thabbil il-mohh" – games "for the brain". Another one pointed out to "loghba tal-isports" – sports types of games; or "apps tal-vidjows", video apps. This is not to say that some parents did not know what their children used, although there were instances where

parents clearly stated that that was the case. It is to show that there are various degrees of understanding of the digital tools among both parents and children; that sometimes parents may group games and activities in simple terms as 'shooting' or 'racing' without making a distinction between, as an example, one racing game that uses foul language and one that does not, one that is played first-person – the player can design his or her own character and 'become someone else' and another game that is multiplayer – other players can play, communicate with one another via audio-visual connection and so on. Furthermore, while some may advocate that the new generation are 'digital natives' (Prensky, 2001) suggesting that young people learn differently from previous generations as a result of their constant interaction with digital media, such propositions remain disputed (Helpser and Eynon, 2010). Nevertheless, these kinds of ideas lead to a number of impacts. First, they can position the parents as the less savvy compared to their children. Thus, many of the interviewed parents expressed their perception of their children as the more knowledgeable when it came to technologies.

> He's pretty independent with technologies. He knows more than me. I need to ask him where things are or what this or that is for. (Father, 45-54, about his son, ten)

> He knows everything. I don't need to show him anything. (Mother, 35-44, about her son, eight)

The interviewed teachers and principals voiced similar opinions about children as technically savvy.

> They don't read much but they know how to use them. I have to go home and prepare how to use these tablets. And the problem is that I also have to carry on with the curriculum about the Microsoft programs but the children all they want is games…to play games. I give them games but that's not enough. When it comes to the computers maybe not so much – the young ones especially. But the ones from Year 5 [ten and eleven-year-olds] already know where everything is. (Teacher to Year 3, 4 and 5 students, private school)

Secondly, publics can easily eschew such claims and begin to believe them without further attempting to understand what they refer to. Followers of such notions that children today are technologically savvy because they are 'digital natives', as some of the interviewed parents and educators voiced, leads them to categorise digital media users without seeing what in reality each category – savvy and non-savvy, natives or immigrants – entails. Similarly, while children may not distinguish between one type of software and another and will still make their way through each seemingly effortlessly such 'skills' that he or she can demonstrate do not suffice to conclude about the child's knowledge of digital media.

Of importance becomes to outline the discrepancies that may exist between parents and children's interpretations of their experiences with the digital tools and the supportive arguments for these differing views. Children may not be able to define or distinguish between software or hardware, between Google and Yahoo.

Nonetheless, many of the interviewed children demonstrated the ability to quickly describe these tools' purpose of use and functionality. Similarly, while a parent may consider that playing a video game like Call of Duty – a first-person shooter game (Activision, 2017) – may lead to violent behaviour or is "a waste of time", to a child such activity may bring about pleasure because he or she may be interacting, connecting, and communicating with friends, siblings, or peers in the meantime or because of the liberating feeling of "becoming" the character of the video game. This example is a case in point with a parent and her son. The mother expressed her opinion about the game as a waste of time and a violent one that could affect her son's behaviour. Her son, on the other hand, a ten-year-old boy from a church school, enjoyed playing the game with his father. He also liked the feeling of "being a soldier". This shows that children's evaluations can differ from the perspectives of their parents. Consequently, such differences can have larger implications within education and even within the family dynamics where family cultures can affect creative practices (Marsh, 2010). Children's views of creative production have to be seen in a similar manner, within the context of school, too. From here it is also important to hear in the children's words what they equally liked, disliked or how they perceived and understood things from their engagement with digital devices in school especially in light of what they already habitually did outside of school.

At the time of this research four of the participant schools – two church, one private and one government – had already enrolled in the one-tablet-per-child policy, albeit without daily use of the tablets in class. Nevertheless, many of the interviewed children had experienced using the devices in class and could share their feelings about this use. Their general perception was relatively negative, even though many

children liked aspects. For example, certain restrictions were not welcomed: “They don’t allow us to download the apps we like” or “they don’t allow us to play any games”. Other children welcomed the idea of turning practice and assessment into games. The interviewed children were asked to describe their ICT lessons as well – the time during which they learned and engaged with digital devices such as computers and tablets. When it came to ICT lessons the majority of interviewed children openly disliked what they were taught. In one instance, an eight-year-old boy from a private school said this about his experience with digital devices in class:

> It’s so boring because the teacher always starts explaining and doesn’t let us touch the computers. Then it’s always PowerPoints, PowerPoints and that’s all boring, too. Then when I’m done and I have to wait for the others to finish because some of them are slow, and she’s still not letting me play games or do other stuff. I know all these PowerPoints and the text – to change the fonts, the increase the size – that’s so boring. But the teacher is always asking us, do this, now do this, now find from file, put the picture. And Level 5 [ten-year-olds] are allowed to play this game with a castle, oh, it’s so cool, and they’re doing so much more interesting things. I can’t wait to get to Level 4 and then level 5, because I’ll be allowed to do what I want on the computer and on the tablets. On the tablets they don’t allow us anything, just what the teacher says.

On another occasion, a ten-year-old boy from a church school shared his experience:

> I don't like the forest game…you have like a map, you need to find a person. It's on the computer. You use it…it's like, it will be with like boxes, and you need to do five forward and one left. It's complicate [sic]. You don't know where he is…and it's just a stupid thing to do. Then at computer lessons we also do PowerPoints. They are interesting. Like, Prep 5 it's not like during Prep 3, which was very boring. What do you want you can do PowerPoint on wrestling and football. You can take stuff from Wikipedia...Sometimes my friend loves this. He makes PowerPoints, my friend goes on Wikipedia or Google and finds information there and copy and paste to his PowerPoint.

In connection to this, five of the ICT teachers interviewed for this study discussed ICT learning and syllabus for the children, aged seven to ten. Independently they agreed that the syllabus was out-dated. On the other hand, they also indicated that ICT teaching took the form, like most other lessons, of instruction, practice, and assessment with no room for free play and individual exploration of the technologies.

> It is so out-dated that it [the National E-Learning Strategy] still talks about floppy disks and kids don't even know what that is. I make my own syllabus but then I have problems with the

> other teachers because when I incorporate modern technologies, like I bought these touch-screen tables, the other teachers don't want to learn to use them, while the kids loved them because they could take control of the lesson, do exercises on the very tables by touching and drawing and shifting things, and once you have the resistance from the other teachers, you can't fight a system. The tables are now covered with a white cloth and used as normal desks.

Another ICT teacher from a private school said this about the program she had developed for her classes from Level 3 to Level 5 (seven- to ten-year-olds):

> I first teach them the basics – the Microsoft programs: Word and PowerPoint. They are taught how to manipulate text, upload photos, save documents, and things like that. Then the little ones I give them to play some games to practice the alphabet and numbers, to do maths and things like that. They like the games but then it's important that they practice and learn how to use the Word and PowerPoint. It's a challenge sometimes because they do completely different things now at home. They play games and all kinds of these apps on their tablets and the computer seems boring obviously. They can't wait for the games and it's difficult to make them follow the instructions sometimes.

In one case in a government school, the teacher of a class of ten-year-old children explained how she had put digital devices into a rather different use.

> I had my blog and then just showed to them how to contribute and write on it. When we did the outings they were taking pictures and then uploading them for everyone to see. The whole school was following [the blog] and commenting. They loved seeing their stuff published online. And not only that, their parents could see and comment too which encouraged them even more. They lost interest too quickly…they have a lot to do with homework and school activities. They can't keep up always. Also it was the exams, so they had to focus on important stuff.

This example highlights new media technologies' provision to connect its users not only with one another but also to resources. Pedagogical practices can make use of such features in order to encourage and ensure that children – the learners – exercise agency over the new tools, are challenged by such opportunities and connect in various ways to "competences and concerns beyond the classroom" (Marsh, 2007, p. 275).

Schools assimilate technologies to fit their own mechanisms (Papert, 1993). This explains why the interviewed teachers said that they taught children how to use programs such as Word and PowerPoint, the way the same seven- to ten-year-old children were taught to learn basic literacy – writing and grammar. PowerPoint – to

structure thought. Excel – to do maths. From the conversations with some of the children and ICT teachers, the children seemed to be lacking the opportunity to do things in reverse: Navigate through computers and tablets, accommodate, and flex their current reality.

It can be disputed whether, if the digital tools currently in use in the interviewed children's schools were removed, reality would change significantly; whether children's literacy or proficiency in Word and Excel would not radically change their world as it currently stands. On the other hand, eliminating an opportunity, where a class of children and their teacher collaborate, populate, promote and create their own blog, for example, would eliminate not the blog as a tool but the sense of purpose, the sense of collaboration with others, the communication opportunities, the opportunities for thinking, and creativity. It will remove a platform for technical, social, and cognitive development to take place.

Therefore, it can be argued that it is not the addition or elimination of the learning how to use a tool, such as Word and Excel, that will better or worsen learning and creativity. It is the addition or elimination of opportunities to let a child to put such tools to use. It is the addition or elimination of putting project, passion, peers, play and, performance, (Resnick, 2014) afforded by digital media devices, that has a larger impact on the creative and – from there – on the learning process. And finally, it is the addition or elimination of opportunities for the children to "bricolage" (Levi-Strauss, 1968), to arrange and re-arrange, to freely try and err, in order to foster creative production. One does not need to invent new ideas, theories, rather, rearrange existing pieces to arrive at novel creations.

Making PowerPoint presentations was yet another creative production according to the children. Making PowerPoints was also taught in schools. While some of the older interviewees – nine, ten and the few eleven-year-olds – found the activity of making PowerPoint presentations a tedious task, many of the younger children, aged seven and eight, said that they liked the activity. PowerPoints seemed to allow children the freedom to take control of the program and create their own product but also express their thoughts or ideas in a versatile way since the Microsoft program lets the user organise and combine text- based as well as audio and visual material. Most of the interviewed children had made PowerPoint presentations for school projects. However, some also liked making PowerPoints for "fun" outside school:

> I use the tablet to do PowerPoints. So I search for information when I need to do a PowerPoints so when I find the information I highlight it and then I copy and paste what I need onto the PowerPoint. (Eight-year-old boy, church school)

> I think sometimes I want to become a kindergarten teacher because I like doing Power Points and I like to point at things and I like talking and explaining to somebody. (Seven-year-old girl, government school)

In many cases children underlined the important factor of others acknowledging their creative work (Gauntlett, 2011). The affordance of digital media to present their work to others seemed to encourage creativity.

> I love Minecraft. Basically, I like making cities. I made this gigantic city. Sometimes my friends come over and I tell them, look at this that I built. And they get impressed. (Nine-year-old boy, government school)

> I make presentations on Microsoft Power Point and Microsoft Word. It's a hobby of mine. I save all of them. I like it because I can show it to my parents and they can say wow what I've did [sic] and I like it when they are proud of me. (Nine-year-old boy, church school)

Others gave similar responses about their pictures or videos. The factor of wanting to show it to someone else was present.

> I take selfies and all kinds of photos then I show them to my friends. You can create loads of stuff like…because what it is…you can take photos. I take loads of selfies and then I show them to my friends, my cousins. (Eight-year-old boy, government school)

5.8. CONCLUSION

The main differences between parents' and children's perspectives of creative production and use of digital media devices can be grouped into three categories of discussion.

Firstly, children's use often stemmed from personal interests. To parents, use for "education" as well as for "fun" seemed to be a big justification of use. While parents allowed fun-related activities, they often seemed to streamline these to one to two examples such as "watching videos" or "playing games" when asked to elaborate. Most parents knew what their children watched on YouTube, for instance. However, the issues associated with the content of what their children watched were often reduced to the question of safety than anything else like creativity. To children, the choice of content they wanted to watch reflected their personal interests. Equally, they watched things for "fun" or when they felt tired. The point to make here is that the control over what they could watch was primarily the children's and that matters greatly when discussing children's creative production through digital devices, as it becomes an indicator that supports the constructionist view of learning.

Secondly, some children seemed to exhibit a negative perception of digital devices being used in schools. They expressed their concerns that school would decide the nature of use without any of their input and, thus, without their interests and perspectives necessarily being met. Having no say in how such devices were used

seemed to discourage many children from having tablets in the classroom. Those children who already used tablets in class expressed such negative feelings. Younger children – seven and eight – who had not used tablets in their schools met the news of tablet-per-child policy with enthusiasm. Those seven- and eight-year-olds who already used the devices in class gave the opposite feedback – that the tablet had become yet another school element and had thus been stripped of all the things the children enjoyed doing with them outside school. A conversation with four boys, aged seven and eight, which took place in a church school where the tablets were already used during lessons, depicted such negative feeling.

> Researcher: Tell me about the tablet in class, what do you use them for?
>
> All boys begin to boo and bang on the floor (where everyone sits with the researcher during the conversation)
>
> Researcher**:** Why do you boo?
>
> Gabriel: Because…
>
> Michael: Because the Miss sends us links and then you have homework.
>
> Gabriel: I hate the tablets for school stuff.
>
> The other boys agree, saying, "me too", "and I as well"…
>
> Researcher**:** Why do you dislike having the tablets in school?
>
> Adam: Because [the teacher] she forces us to do things we don't want to. Because she tells us don't download apps that we can't use in class because then we use space and then she stays telling you go do your research and then on her computer she has a ton

of screens and if someone is at the back of the class and then she has a ton of screens and then she'll know what you're doing and she can block your screen and this is really annoying because she…she knows what you're doing and you can't do anything because she can see what you're doing. And then there's the guy on the van like he...[is older] the teacher doesn't see anything, he says, so the kids can do and play whatever they want to do, so they can play games and everything, that's in junior school so it's not fair that they don't allow us to do anything while the juniors do.

Tony: I want to break it.

Researcher: The tablet?

Tony: Yes, I hate it. Because it's a thing from school so I will break it.

Michael: He wants to break everything.

Tony: I hate school. I hate school because our teacher is really strict. Like, you have lessons of reading and then we have tables and she tells us you search for photos or information and once you search it you have to write it on the paper and I hate that because I want to go home and play. And she will just tell you no games, so we can never play any games.

Researcher**:** Do you find it useful to use the Internet when you need to search for information?

Michael answers yes. The others say no.

> Researcher**:** What do you like searching about without the teacher ever telling you? Or maybe you like making things?
>
> Michael: If at home I only play games I don't search for thing in school important [sic] I do school because I can get grounded for eight whole weeks.
>
> Gabriel: I use the tablet to do PowerPoint. So, I search for information when I need to do a PowerPoint so when I find the information I highlight it and then I copy and paste what I need onto the PowerPoint. But that's homework.
>
> Researcher: Do you copy it exactly word by word?
>
> Gabriel: Yes, but then I make it my own. I end up playing around and then it becomes totally different and my own. It's like not copied anymore.

And thirdly, children tended to identify a much wider variety of activities they engaged in that could be considered as creative production unlike their parents. Even those children who said they copied things seen on the Internet ultimately iterated and remixed the copied ideas into new – their own – versions. This was evident during conversations with children who looked up how to draw things. Others made PowerPoint presentations and copied information but then re-designed and reworded things to make it more personal. Yet others looked up for ideas how to build things with Lego pieces, wood, make-up, fabric and so on. This confirms that ideas grow from previous ideas (Boden, 2004). It also confirms what literature says about combining and re-mixing materials, content and so on into new creations

as being an important aspect of creativity (Ackermann, 2013; Tanggaard and Wegener, 2015).

The difference between children's and parents' perspectives of creative production and use may relate to the fact that what children engaged in may not be well understood by others who do not or have not tried similar experiences. In connection to this, Nikken and Jansz (2006) for example point out:

> …Unlike television, enjoying a videogame requires a serious investment of playing time in order to be able to operate the interface as well as to understand the game's structure. Parents who do not game themselves may find it difficult to grasp what is going on in videogames. (Nikken and Jansz, 2006, p. 183)

Referring to Sherry Turkle that "video games are something you do, a world that you enter, and, to a certain extent, they are something you "become"" (Turkle, 2005, p. 66-67), Nikken and Jansz argue that a video game requires "more serious investment of playing time in order to be able to operate the interface as well as to understand the game's structure" (2006, p. 183) – a time that not many parents can afford. Restrictive mediation was therefore most strongly connected with parents' negative attitude, which was induced by the lack of understanding or engaging in activities involving digital media. The less restrictive mediation and co-playing came from parents who played videogames themselves, which was also linked to a more positive attitude towards video games as a whole (Nikken and Jansz, 2006).

This example is brought in to portray a possible scenario where the parents interviewed for this thesis are less involved in children's own activities with regards to creative production through digital media devices. Where parents may seem to have a limited view of what is considered creative production, their mediation of digital media use may follow such views – and such mediation may lead to fewer opportunities than digital media can otherwise afford (Livingstone et al., 2015). Teachers, too, as others have pointed out, must recognise what is creative production from the children's perspective in order for them to help in the process and nurture such activities (Ejsing-Duun and Skovbjerg, 2016).

CHAPTER 6

DISCUSSION OF RESEARCH FINDINGS FROM PHASES 1 AND 2

6.1. INTRODUCTION

The preliminary goal of this thesis is to understand how the observed and interviewed children used their digital media devices. The interviews and observations were then used to propose means to foster creative production and use, which, in turn, contributed further to the findings of this research. There are four discussions that arise from the conclusions of the first two phases of this research. These discussions can be understood as both current realities and also as challenges that must be addressed by parents and schools in the effort to foster creative production through digital media devices.

6.2. TOOLS OR REWARDS

The first discussion relates to how children and parents, equally, perceived digital devices. The frame of mind may have some influence over use as the research findings from this thesis demonstrate. Children received digital devices as gifts. Across all focus groups conducted for this study, nearly all children said that they received their digital devices – tablets or phones – as gifts.

> My mother gave me a Samsung for birthday and my aunt gave me one for my birthday as well. (Girl, eight, government school)

> I got one for Christmas. (Boy, eight, government school)

As such, these 'gifts' were used not simply as tools but as reward or punishment to control behaviour. The notion that tablets come as gifts may separate them from school and homework, further shielding the prospect of seeing them simply as tools that can aid learning and homework (Lin, 2017), support literacy (Giouroukakis and Connolly, 2013; Ohler, 2013), enrich science subjects (Brunsell and Horejsi, 2012), connect digital and physical worlds to enhance learning (Raths, 2015) and use them for creative production (Ejsing-Duun and Skovbjerg, 2016). Many children interviewed in this study expressed how their use of the digital tablet was conditioned.

> I can play [on the tablet] only after I do my homework. (Boy, nine, church school)

> When my brother or I misbehave they take my tablet away. (Boy, nine, church school)

Similarly, the tablet seemed to be regularly separated from school activities when children discussed homework and engagement with digital devices even if such clear-cut reward and punishment approach did not apply in some of the cases.

> Not that I'm not allowed but I have lots of studying to do and on the weekend especially, and I already did the table of eight. (Girl, seven, government school)

> I have to do my homework first. But I don't really have rules. They let me but when it's too much homework I just don't have the time. (Girl, eight, government school)

Some of the interviewed children in this study discussed that they consumed content the way they would do when "crashing" in front of television, with more personal control over the choice of and access to content from a digital tablet.

> I mainly watch funny videos. You can't get those on TV. And then I can watch them in my bedroom. (Boy, nine, government school)

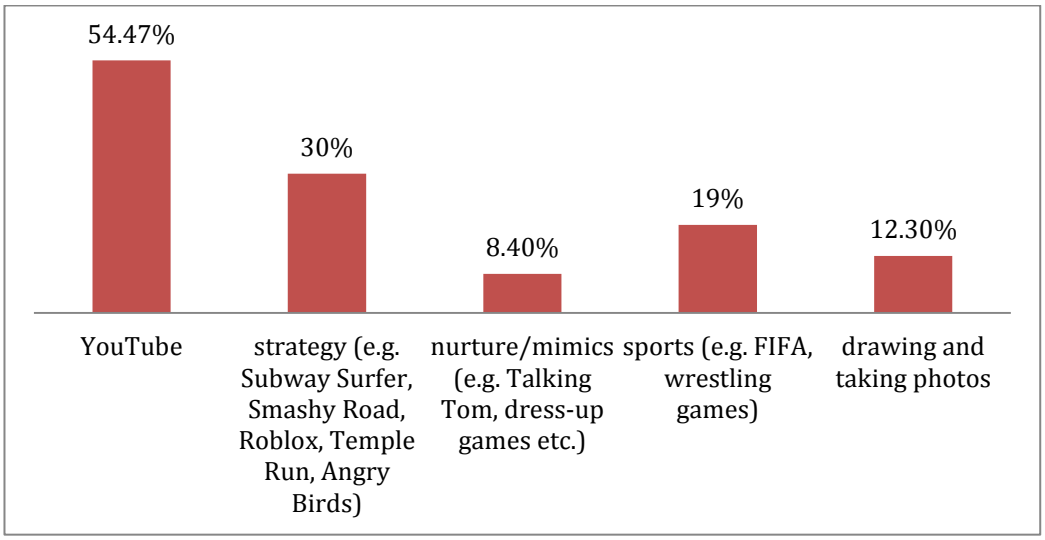
I play games and sometimes I watch cat videos they are really funny and cute. (Boy, eight, church school)

I only watch like YouTubers like Dan TDM and Who's Your Daddy. I love Minecraft and I watch a lot of YouTubers like Minecraft. (Boy, ten, private school)

I like watching like when I'm super tired. And my mom will let me watch some videos on my iPad just for fun so my eyes can rest a bit from all the studying and stuff. (Girl, ten, private school)

More than half of the surveyed parents, nearly 55%, also said that their children's favourite apps at the time of this research included watching videos on apps like YouTube and playing games (chart 17).

Chart 17: What are your child's five favourite apps at this moment?



Using tablets often to watch video content also happened because many of the children in this study, as they have described their current lives, seemed to have less time and energy for doing much else.

While using a digital medium for entertainment is not necessarily bad, it is highlighted as an issue in this thesis because such rather limited use – mainly to watch video content – may preclude the user from accessing wider potentials afforded by their digital devices. Moreover, while children did express their experiences in creative production using their digital devices, this seemed to happen less often compared to watching YouTube videos such as Try Not To Laugh or Who's Your Daddy (popular examples among the interviewed children across all socio-economic backgrounds) or playing strategy games when placed in the bigger context – heavy school and extra-curricular schedules (discussed later), limited opportunities for creative production in school as the children perceived these, and little or no recognition from parents and teachers regarding what is considered creative production using digital devices. Added to this context is the perception of the tablet as an award or punishment. Such notions can have an impact on how children perceive these tools – as means to creative production and tools to fostering and expressing their own creativity or as a valuable treasure that can control their behaviour.

6.3. SELF-NAVIGATED CREATIVITY

The second discussion relates to the manner in which the children in this study explored digital devices and the tools embedded in them. On the one hand, they showed motivation and curiosity, which encouraged many to self-navigate through their digital tools. It was plausible to see and hear a seven-year-old girl, Annabel, talk about how she took the initiative, without anyone telling her or putting any pressure on her, to learn new languages. The quote below is from a conversation with Annabel during which she explained how she wanted to learn languages on her own thanks to the Internet:

> There is a website and you can learn so many languages but I forgot the name. Tongue Twister, I think it's called. About the language I started researching on my own about how to learn another language. I want to learn Italian and Russian. My big sister learns Italian and Russian. Sometimes I really wish to go there so I want to learn the languages first. We don't [sic] the lessons in school. My parents are Maltese; they don't speak it [the languages].

Many young boys and girls in this study have also demonstrated the confidence and the things that they experienced when they explored subjects and tools.

> I like making things, like all the time. I've done creative writing a lot of times. I do a lot of stuff. Like I'm working on

> a project I'm trying to fix it. It's broken so I'm trying to fix it. [It is] an iPhone 4 which was all broken and the screen is broken so I would open it up, I take on the stuff and put in good stuff to make it work. (Nine-year-old boy, private school)

> I look at people like who have conditions, like when they have Down's syndrome. Because I'm really fascinated because when I grow up I really want to help people that have these types of conditions. (Eight-year-old girl, government school)

Some of the children interviewed for this thesis showed that they experimented with their devices in various ways. They tried games, watched programs, and navigated through the Internet. Jason, nine, from a private school, explained the way he enjoyed his love for football, which is expressed not only through his practice with his local junior team or through the FIFA '15 and '16, a football simulation video game, which he said he played mainly on the weekends, but also through his experimentations when he played Minecraft:

> I like, you know, like the Nike shops? I like putting lots of sofas everywhere and then I got the football shoes and then I put them under, under this shelf and then I put the shin guards…so I make like a shop. And that's why I also love playing FIFA 16 and FIFA 15.

Simone, nine-year-old from a private school, said that she used her tablet to look up things she found interesting in school:

> Usually for religion, it's my favourite subject in school, so I like to check these stories that they tell us in class and then I have to read about them on the Internet.

Adam, nine, also from a private school talked about how his personal motivation for writing fictional stories has led him to use his tablet for a very specific purpose:

> I go on Google then I write English stories and then I see how to write a story. I was looking for example for Sunny Day story. Then I read it and I really liked it and then it, like, gave me ideas how to write my own stories.

Natasha, ten, from a private school, used her tablet rarely because she had too many extra curricular activities and homework during the week as she explained during a focus group in which she took part (her typical week is presented later in this document). She said that still used her tablet, albeit on occasions. In her own words:

> When my mother feels sick I go to the iPad and I just get some recipes because I'm allowed. You know I don't touch the oven or anything like that, I'm not allowed but something only that I can warm up some milk and then I make her some sandwiches

> with cheese. I just type on my iPad for the recipes and get ideas from there.

Two girls, seven, from a government school, said that they liked music and dance. From their words it is clear how they have managed to accommodate their tablet use according to their interests:

> We make videos on our tablet, like when we see a new song we make like…the video clip, like there was the song Walk on Water [Eurovision Maltese contesting song] and the Russian song and we made it.

On the other hand, some of the children in this study seemed to shift from one app and interest to another, as evidenced through conversations. The access to an overwhelming amount of apps and games suggested that such wide availability would put no pressure on the user to stick to any of these for too long to discover or master in depth. For example, Kian, ten, from a private school, said:

> I don't have a lot of favourite games. I used to but a lot of them are very babyish. Minecraft maybe. Minecraft and Who's Your Daddy I like watching YouTube, some YouTubers that play Minecraft. That's on YouTube – Who's your Daddy.

Melissa, eleven, from a private school expressed her changing tastes by saying:

> I'm not into games and stuff. We play games when we go to a party. I have Watsapp, Viber. I'd stay chatting at night with my friends.

Ron, ten, from a church school, also talked about his changing interests, his *now* (at the time of the interview) playing tactics and his discoveries:

> I liked building houses at some point. I guess I still do. But now I'm also exploiting glitches right now. It's like you look for bugs in the game and, for example, if you are on 'survive mode' you need to, like, keep mining all the time through things but there is a glitch where you can get to and obtain resources.

Others replied on the same wavelength.

> They're so many, I have so many apps on play store. They make new ones all the time. I have like hundreds... (Boy, nine, church school)

> I don't even bother to open some. I've downloaded so many... (Boy, nine, church school)

Some of the interviewed children have also shown that their passion could quickly subside or could be transferred to a newly discovered game or virtual place.

> We used to play Ghostbusters a lot. But now I like Minecraft mainly. I like watching on YouTube as well (others playing Minecraft).

> Yes [he used to like Minecraft], but I got bored and then I got jealous of all the other players who got all these other mods. Like Dan TDM he has like this mod... that's when I was younger. Now I just watch games like Grand Theft Auto…(Boy, eight, private school)

In view of the way the children in this study reflected on their changing interests in one app over another, there can be both hopeful and pessimistic outlooks at the prospect of fostering creative production through digital media devices. On the one hand, motivated by their interests and curiosities, many of the children in this study demonstrated the self-initiative to explore how their digital devices can support these.

On the other hand, some of the children interviewed for this thesis showed how they tended to 'stick' to a few apps then move on to new ones, seemingly within short periods of time. This hopping from one activity, app, or game to another could be seen as a 'shallow' aptitude – a culture of trying things out only skin-deep. The combination of easy access to and availability of a multitude of free or paid apps and games and the lack of time because many of the children interviewed for this thesis have shown that they do so much in school and outside school (discussed next)

enables a sense of being on a constant drift, putting no pressure on the user to work harder, to ‘put in the hours’ and delve deeper into a new craft, skill, or enterprise.

The children in this study have shown that while they are at an age when they have only just begun to read and write, they already have a grasp of a wide array of fields that previous generations could not even have access to. More than that, they take the sole initiative to follow their curiosities realising that digital media devices are like open doors to further discovery. The thought of an average eight-year-old back in the 1950s to take pictures or videos on a daily basis for “fun” would have been extraordinary, if not unthinkable.

Today, children experiment with and have access to various digital tools (many of which simulate real tools that children of the age observed in this study would have not been legally allowed to access and use: E.g. tools related to cooking, to coiffure, to building and construction, to experimenting with chemical elements and so on). Albeit simulative, such realistic and vivid experimentation with various tools that rather only adults would have access to, including video and photography, are afforded to children today more than any generation before them. And, albeit on the surface, this seemingly ‘shallow’ exploration leaves its mark. It is cumulative. It also allows the children to see choices and possibilities from which to pick then expand their interests and focus in depth.

6.4. THE OVERSCHEDULED CHILD

Many of the children interviewed for this study, coming from more affluent backgrounds, described that they live a busy life, compared to those from government schools. This is not to link full a week of school and extra curricular activities to any form of threats towards a child's wellbeing. The argument about the negative effects of overscheduling children (Rosenfeld and Wise, 2000) remains largely contentious (Majoney, Harris and Eccles 2008; Orr, 2017). This third discussion aims to bring to light the actual realistic time children have, or have not, in creative production with digital devices. In other words, there is only so much one can do in the waking hours. Creative production also requires some cognitive processes to take place (Runco and Chand, 1995). Increased cognitive load (such as from heavy schedules) can affect performance of cognitive tasks (Paas et al., 2010).

Mark, from a private school, mentioned earlier in this thesis was nine at the time of the interview. He said that he would wake up at six in the morning during school time. He would catch the school van and would not return home before five, sometimes even eight in the evening, when he would sit down to do homework. He would return home after five or six everyday because after-school activities would have kept him occupied until then.

> I have football, tennis, and I have private lessons as well. I have golf twice a week, and then I also play basketball once a week, and I have swimming twice a week. Yes, I love it. Well,

> I feel burnt out sometimes. Like, I had, when I have tournaments, with tennis and with golf, and then we have loads of homework so I have to.

The system of this financially well-off child, and of others like him, interviewed for this thesis, seemed unyielding, designed for boys who, as Mark's principal said, "must use all their energy otherwise they easily get into trouble."

In their own words some of the interviewed children described heavy daily routines of extra curricular activities:

> On Mondays I have baseball, on Tuesdays I have volleyball and rock climbing, on Wednesdays I have extra hour – I stay one hour more in school…Because to do my homework and also because my sister has catechism, then on Thursdays I have football and baseball. And on Saturdays I have two hours of baseball and on Sundays I have baseball for one hour. (Boy, ten, private school)

> On Monday I have jazz and ballet. Yesterday I had Spanish and character. Saturday I have hip-hop, ballet and character. On Thursday sometimes I have character and then I have Spanish lessons. (Girl, ten, private school)

When asked to explain whether all these activities were their own choices, many of the children interviewed for this research often said yes. Sometimes, however, it seemed as though they did not necessarily agree with what they have taken after school.

> I don't like the ballet very much but my mother takes me because she says it's good for the posture and also but then I like it when we have the concerts. (Girl, ten, private school)

> I hate going sometimes. I just want to stay at home especially in winter. And sometimes I just don't want to do anything but that never happens. (Girl, ten, private school)

> I hate football. I hope to stop [it]. Then summer I only will have scouts. (Boy, nine, private school)

Confronted with the question about what they have done unplanned, many children would have remained silent giving no specific reply.

> What I do unplanned…is, hm, sometimes I go to the supermarket. (Girl, nine, private school)

In their disclosure, children represent families who, on the outside, seem to have it all. The busy schedules they follow and high expectations they strive to meet, however, also raises the question of whether some children are overscheduled and

over-stimulated, whether they have any time left for self-reflection, for experience of boredom, for 'figuring it out' on their own. Such uncompromising structures, demanding of participation, practice, equipment, homework, regular assessments, goals create the need for enquiry about the availability of time in a child's life to be a child, 'room' for adventure, for unpredictability, to test one's imagination, one's character, one's creativity.

6.5. FINANCIALLY RICH OR QUALITY TIME RICH?

The fourth discussion stemming from the first half of this research is descriptive of a reality in which the children of this study live and develop. This reality poses the need to set a reminder that financially rich does not always mean available family quality time. A large body of literature has shown how regular parental involvement and communication with children helps them perform better in school (Hill and Taylor, 2004; Arnold, Zeljo and Doctoroff, 2008; Bates, 2005); improves their reading skills (Weigel, Martin and Bennett, 2006; Britto, Brooks-Gunn and Griffin, 2006; Cottone, 2012); supports normal social development (El Nokali et.al, 2010; Hindman and Morrison, 2012); aids behavioural and learning competencies (Fantuzzo, 2004) and achievement in science subjects (Van Voorhis, 2003). From conversations with the children in this study, it has been brought to attention how the presence, or lack thereof, of family time and regular communication, regardless of socio-economic background, can also reflect on how children would put their digital device into use. For example, Don, ten, from a private school, talked about his

restricted use of digital devices, on the one hand, and about the family conversations that have let him use their family iPad and his grandfather's computer with clear goals in mind, on the other.

> All of my family has [an iPad] and I'm not allowed to use it. Actually, we do but when we're together. Not alone. So, if my sister asks something and then my mom will check it up and we will all see on the iPad or read about it…But then we talk about it or she'll help my sister with her homework like that. I'm not allowed to use the iPad – not allowed to play games. They [his parents] tell us we can't use the iPad for games or to just sit and watch…but I know why. She prefers when I read books. And that's easy because I love reading…I use nanu's [grandfather's] computer. He teaches me how to use it whenever I go to his house. I use the computer at my nanu's but I don't go there very often. He teaches me stuff but I only use it for games because I never get to play games, so only when I'm there I play games mainly.

As a mother of three children (ten, eight, and six), Roberta, thirty-nine, a graduate who specializes in primary-school children with learning disabilities, described the home setting and the digital 'rules' Don, her son, lived in:

> We have an iPad on our kitchen top and we use it for information but they are not allowed to play games or have it

> whenever they like. We do homework, for example, and they'd say 'what is this' and we look it up. Let's say we're talking about Jamie Oliver who is in school [at the time of the interview the celebrity chef visited the private school Don goes to], so we'd say who is he, so we look him up, and I let them look him up. Other that it's not going to be games or anything of this sort. We'd talk to them [her three children] a lot about technologies. We don't really say this is bad, don't do it. It's more open, so both my husband and I try to give them an objective perspective of the dangers but also of what they could use the computer and the devices for.

Throughout the conversations with the interviewed children for this thesis it became evident that equally boys and girls from all kinds of socio-economic backgrounds expressed their needs for quality time with parents or siblings. Children of parents from all kinds of financial and educational backgrounds explained their typical digital media use which often resulted from personal interests and curiosities. On a typical school day all children were likely to report that they used digital media less compared to the time they allocated – or were allowed – during non-school days such as on a weekend. There were very few cases – less than ten children – from poorer backgrounds that reported that they used their tablets for longer hours during a typical day. Nevertheless, such use, again, seemed that it was not typical, that is, daily. Rather, the respondents would have recalled a day when they spent hours playing a particular video game. Relatedly, both parents from more affluent

(executives and professionals occupying senior management positions) and less affluent (with 'intermediate' or 'entry level' occupations) backgrounds reported that their children engage with digital media for less amount of time during school days and more during non-school days. Screen time seemed important to parents from all social backgrounds. Similarly, no rampant discrepancy was identified throughout the conversations with the children with regards to the type of activities they engaged with. Focus groups from a government school recognised the games and the apps that would have been listed by a focus group of children from a private school and vice versa. There were equally children from government, church and private schools who discussed their interests and pursuits which their digital devices seemed to help them pursue further.

In less privileged settings there were children who spoke about their discussions with their parents, demonstrating that such personal interactions mattered to them. Seven-year-old Annabel, from a government school, was mentioned earlier in this thesis. She talked about her wish to learn Italian and Russian and to visit Russia one day because it was something they "talk about a lot with my [older] sister". In Annabel's words:

> I want to become a kindergarten teacher and take care of children and teach children …we talk with my mom and my sister…we talk many times at home at dinner. I tell my mom what I want to do one day…After I go to the lessons about Jesus…and then when we walked with my mom and we talked

last time about this PowerPoint I wanted to make that I was imagining my next lesson to my children.

Edgar, nine, from a private school, a much taller and mature boy in the way he spoke compared to his classmates (the rest of that particular focus group) said this about communicating with his parents and specifically with regards to his dreams:

Edgar: I want to become a YouTuber, because I really like that people will watch me. It will be quite fun. They [his parents] don't allow me to express myself. I'd like to keep it a secret [his idea of becoming a YouTuber] because they won't want me to be that so when I grow up they will not have any choice but will comply. I think they want me to be a scientist or like that. Some of them [his favourite YouTubers] are so funny. Won't it be just great to make people laugh and entertain them? That's what I want to do one day.

Researcher: And your parents won't agree with your choice?

Edgar: Yes, I'm afraid.

The factors that define a well-to-do family go beyond parents' education and finances. Level of education, type of schooling, and professions were collected as data from the parents. However, to fully imagine and understand the social settings in which the children interviewed for this research lived in and grew, the enquiry went beyond statistics. During conversations with the children in this study they were asked to describe the routines of their lives; the way they had their meals; how

they spent their weekends; when they considered quality time with their parents; the time of day they considered their favourite; and so on. Throughout these conversations both financially 'richer' and 'poorer' children talked about their moms and dads – time spent or not enough time spent with them: A boy, nine, from a private school said this about his favourite pastime:

> Best time ever was building a tree house with my dad on top of our garage, not on a tree though. Now of course no one goes there as we don't have time but it was nice to build it and being with him.

The best day for many of the interviewed children included family members and friends. This was a recurring theme when the children described favourite things or the perfect weekend.

> I like when my cousin comes and we play together but that's on the holidays maybe, like around Christmas, when there is no homework. (Boy, eight, church school)

> Sometimes I go on our scooters with friends, but that's rare, but I look forward to summer because we do that more often then. (Girl, ten, private school)

Many of the interviewed children regarded conversations at dinnertime as a valuable activity. Regardless of their background, some of them also demonstrated their

personal views regarding behaviour such as table manners. Many of them considered television buzzing during mealtimes wrong. Some also reflected negatively on their parents' or siblings' inattentiveness when they used their mobile phones in certain situations.

> No! It's very rude to have the iPads at dinner. We just play music at most because we all like it around dinner. My favourite is Sundays. My dad has this speaker and he plays on Spotify and on this speaker. It's quite fun. (Boy, nine, private school)

> We like present conversations during dinner. (Boy, ten, private school)

There were also cases in which financially well-off children spoke about eating alone, making their own breakfast or lunch, watching something on their tablet so that they do not feel alone.

> It's really rude to use technologies at dinner table. But it depends though. If you don't have anything else or you're alone and you don't have anyone to have a conversation with. (Boy, ten, private school)

> I eat alone a lot of the times. It's quite lonely. Except for when my brother joins me. My parents work sometimes, often

> maybe. My dad's always working since that happens at home. I'll play YouTube to kill the silence. That works ok. But sometimes I just feel like talking to someone. (Boy, ten, private school)

In the constant presence of digital media devices in the family home and their power to whisk its members away from their immediate, physical environment, intimate family time and conversations weighed in as important factors to many of the interviewed children. Both well-off children and those from less privileged backgrounds showed understanding in the negative effects technologies can exert over relationships and conversations. The relevance of such context to the research question of this thesis is two-fold. First, digital devices should not be accepted as part of everyday family context without making the effort to identify or understand what these could potentially contribute with or take away. For instance, copying content from the Internet to create a PowerPoint presentation can be recognised as part of the process of creative production. Parents or teachers may disqualify or even reprimand such seemingly minor activity. However, seeing it as a stepping stone to the child's own creation or even to the child's own way of learning can reframe the debate on how such tablets should or could be used in school and what rules and mediation should be imposed as a result. Second, accepting that digital devices change the dynamics of family life is technologically deterministic. Cultures equally shape technologies as much as the reverse can be argued (Loveless and Williamson, 2013). And while parents and children seem to get on with the 'new' conditions of living in thick digitally networked environments this is not to say that technologies take control over the interests and the values of its users. Parents, educators, and

equally children must be aware of the power they can exert over technologies. The point to this thesis is to highlight the importance of seeing digital media devices not as ‘gifts’ or methods of awarding or punishing behaviour, solely as supplements to the established curriculum, or as mini TV sets, but as tools to creative production and, therefore, constructive, personalized learning, discovery and development.

CHAPTER 7

FINDINGS OF RESEARCH PHASE 3

7.1. RATIONALE

The initial research of this thesis has identified that children interact daily with digital media devices but they do not engage in making and creating things with them. Digital devices afford beyond the search engine, beyond the video game, beyond the video apps, such as YouTube. They can allow children to build their own games, their own blogs, online shops, and experience each others' creations and ideas (Resnick, 2014, 1998). Digital devices can connect users; offer them platforms to collaborate, to exchange ideas, to perform and showcase their work and share with others (Gauntlett, 2011, 2015; Loveless, 2003; Resnick, 2014). Users must be able to build new tools or create new things with existing digital tools (Resnick, 2002; Ejsing-Duun and Skovbherg, 2016; Ackermann, 2013; Boden, 2004), the way they appropriate new media technologies (Ito, et al., 2009; Mediappro, 2006). Therefore,

children, as young as seven- to ten-years old, can and should also benefit from digital devices by seeing them as tools to creative production.

This research has identified a gap in the current Maltese environment with regards to how digital devices, tablets specifically, have been used among a number of seven- to ten-year-old children in and outside of school. Where these tablets were already introduced to Year 4 students (eight-and-nine-year-olds) in government schools – 6,027 tablets in total (Times of Malta, 2017) – there is currently no unified framework for use or method to foster creativity through these tools in class. According to the interviewed ICT teachers and many of the interviewed children the tablets were used to practice basic literacy and numeracy. In general, the ICT syllabus (www.curriculum.gov.mt for Year 4 and Year 5 students), outlines the following objectives:

3. Combine texts and images within main software packages,
4. Access the World Wide Web,
5. Use email,
6. Browse and navigate CD-ROMs.

According to the syllabus (Directorate for learning and assessment programs, 2012) fall under the categories of:

1) Communicating information ability,
2) Handling information ability,
3) ICT management ability, and

4) ICT evaluating ability.

The learning objectives include “simple Logo instructions to control basic devices” (ICT Syllabus for Primary Schools, p. 52) where “the teacher can apply these skills in maths activities, to cover topics such as angles and triangles…” (p. 52). This is suggestive of the argument that technologies are very much accommodated to fit the overall school curriculum (Papert, 1993).

In support of the above, the interviewed ICT teachers discussed how school accommodated technologies to fit its structures, as predicted by Seymour Papert (Papert, 1993).

> We use the tablets to help the children practice and exercise things that they learn in class. For example, they practice maths and reading, but the games are a lot more engaging and they seem to be enjoying the learning of these new concepts more when they have the games to go with the lesson. (ICT teacher, government school)

Similarly, creativity and making creative things through digital media have not been incorporated in any lesson as this does not line up with any of the school lessons, while such activities, too, would prove difficult to assess and quantify, as another ICT teacher said.

> It's very important for them to be creative. Creativity is now a key skill in today's day and age. However, we can't just let children play around with these tablets because they end up playing games and wasting their time. The challenge is also how to assess creativity, I mean, this is something very personal and I'm sure that one will find one's creation unique whilst someone else might find it uninteresting or nothing special. (ICT teacher, private school)

While literature has acknowledged the difficulties that stem from assessing creativity (Runco, 2004; Rubenson and Runco, 1992) this should not be the sole reason to, as the ICT teacher said, not "let children play around with these tablets". Creativity can be and is personal – what literature refers to everyday, small 'c' creativity (Kaufman and Sternberg, 2010). Yet, more often than not, teachers tend to decide what counts as original or "uninteresting or nothing special". As one of this ICT teacher's eight-year-old pupils lamented during an interview (with three other children who seemed to agree), "Why should the teacher decide whose Lego creation is the best?" The pupil referred to Lego building during "Lego education" lesson, which had run for two consecutive weeks of a total of four lessons. Yet, the teacher decided what the children had to create; the same teacher decided whose creation was the best.

> She tells us what we have to build. For example, we had to make a garden of some kind. I don't want to make a garden.

> Why can't I make something that I like? Then the teacher decides…she goes around everyone and picks the best one. Only that student goes in front of the class to talk about it. Because the teacher decided that her garden is the most creative. (Boy, eight, private school)

On the other hand, other teachers acknowledged the importance of play. At the same time, however, they also seemed to see the need to control how much play children were allowed.

> The Minecraft game is very good for children to practice their creativity. They love playing it. We allow them only after the end of the lesson but this is not part of the lesson itself. They can't just sit constructing all day long. They have to learn things. Then they have their exams and what's more important, the subjects become much harder year after year so with these devices it's become really difficult to make the children put in the hours to study. They go home and their parents allow them to stay on the iPads for hours. (Principal of a private school)

At least two points stem from the principal's opinion. Firstly, phases 1 and 2 of this research have revealed that, on a daily basis, during school time, the interviewed children spent, on average, little time with their digital devices. The principal of this private school referred to her pupils who finished lessons by 15:30 pm. Many would head for extra curricular activities after that time. Contrary to the principal's

perception, most of these children whom she spoke about, in fact, said that they rarely used their tablets on school days. The principal then focused on an example about one pupil who came "very tired to school one day and said that he stayed up all night playing on his tablet." This case seemed to have led the principal to generalise about other pupils by saying that "*they* go home and their parents allow them to stay on their iPads for hours".

Secondly, generalising from a single case may obviously lead to unfair conclusions. It can cloud the view of the activities children engaged in and the details surrounding these. Many children said that they liked listening to music on their tablets before going to bed. Others said that they liked interactive storybooks. In that regard, literature has demonstrated how digital storytelling has been used in class as a new path to creativity and learning (Ohler, 2013). These activities simply cannot be lumped together as the reason that children came to school tired besides that there are numerous other external or even internal factors (a child has been sick or worried about exams?) that may cause the tiredness. Moreover, such activities cannot be excluded from the need, as the principal stressed, that the children "have to learn things". Finally, this statement should be a reminder that jumping to heuristics (Kahneman and Tversky, 1973) in the face of something, perhaps seen as complex as digital media devices in the hands and lives of children unlike any other generation can lead to misjudgements, prejudice and less opportunities given to the dependent user, the child.

The principal also made another value judgement with regards to her understanding of "learning". What to others, like this principal, was considered learning may not

necessarily agree with what learning meant according to the children, or what research has acknowledged as formal and informal learning (Sefton-Green, 2010) or learning by construction and self-navigation (Resnick, 2002; Plowman et al., 2011). There must be a wider discussion on what different generations understand by "learning" within the Maltese context as this research reveals that some parents and teachers, similar to this school principal, identify some aspects as "learning" while others not. To a child learning may include playing a video game such as Cut The Rope – a physics-based puzzle game – while to the principal or another adult the game may be considered as "waste of time". There must be an alignment developed between the various angles of learning as it seems that certain dominant understandings of 'educational' and 'learning' may cut out on new opportunities from children's engagement with digital media tools.

On separate occasions, some of the interviewed ICT teachers confirmed that they prepared eight and nine-year-olds how to use Microsoft documents, such as Word, Excel and PowerPoint as well as specific programs that helped children to train and practice numeracy and literacy, in particular Literacy Pro (for reading comprehension) and Dynamo Maths (to practice mathematical problems). A boy, nine, from a government school, has described his typical use of tablets in class this way:

> We use ours for Mental Maths. That's Workspace; it has like a typing, a rubber, everything like a board and you can use that instead of paper and pen. And then you have the app for religion and for Malti and for English.

According to all interviewed ICT teachers, they have neither introduced nor allowed children, aged seven to ten, for independent, self-directed project development through the use of digital devices. This is not to discredit the use of digital devices to support basic literacy and numeracy. Relatedly, according to Feldhusen and Kolloff's model of creativity development (in Nickerson, 1999), two fundamental stages involve the strengthening of basic language and mathematical skills and then building onto those through various problem-solving tasks. Nevertheless, their model, which specifically looks at gifted and talented children, also stresses the importance of performance of independent, self-directed project development (Feldhusen and Kolloff, 1988). That is, beyond strengthening skills such as literacy and numeracy, children must be allowed and encouraged to explore and develop, in a self-directed manner, creative projects and ideas, also because self-management is a metacognitive skill – "intentional monitoring and guiding of one's own behaviour" (Nickerson, 1999, p. 416) which has also been linked to creative thinking (Runco, 1990 in Nickerson, 1999). Moreover, the fact that children use their digital devices in a playful manner – for entertainment, for playing games – as many of the interviewed children described, the role of play must not be disregarded. It is an important factor to creativity (Vygotsky, 2004; Russ, 2003; Runco, 1996). Apps that many of the interviewed children mentioned, such as Minecraft, the Toca Boca series (hair saloon, hospital, farm, kitchen, pet doctor and so on), My free Zoo, World Chef, World Chef, and so on, allow children, through "symbolic play", to "attain unrealisable tendencies" (Pellegrini, 2001, p. 864).

The digital devices can create the opportunity for children to enter a "zone of proximal development" (Vygotsky, 2004, p. 86). In it, children exhibit more competence and motivation – as they derive pleasure from the engagement in play – and motivation towards serious objectives (Pellegrini, 2001). Vygotsky deemed the zone of proximal development "the place at which a child's empirically rich but disorganised spontaneous concepts "meet" the systematicity and logic of adult reasoning" (Kozulin (Ed.), 1986, p. xxxv). The effectiveness of the zone of proximal development depends on children's relative capacities to appropriate adult structures. Within the zone of proximal development, digital media devices can be seen as another external element – in the role of a mediator – an external to the developing organism factor (Vygotsky, 1978). As such it can potentially influence the development of children. This brings to the argument that where the structure-dependency position of constructivist Piaget can be limiting in seeing problem-solving progress being made by the child who is left on their own, social-cultural perspective which looks not only at what *is* – the completed part of development – but a view of the developmental potential. And developmental potential, according to Vygotsky, can expand through external intervention (Rieber, 1997). This argument fits with the others that creativity, linked to learning (Craft, 2001), can be trained (Mumford, Scott and Leritz, 2004) specifically with regards to elementary school children and digital media (Clements, 1991; Enriquez, 2010; Kim et al., 2014) among various age groups, backgrounds, and subjects.

After reviewing numerous training programs aiming at developing creativity, Mumford, Scott, and Leritz concluded that well-structured creativity training programs, could induce creative capacity with the possibility to generalize across

criteria, settings, and various populations (Mumford, Scott and Leritz, 2004). Specifically, those based on cognitive approach – those that include processes linked to "the generation of new ideas…problem finding, conceptual combination, and idea generation" contribute to the effectiveness of training (Mumford, Scott and Leritz, 2004, p. 382). Similarly, studies have shown that what Piaget saw as developmentally constraining factors could be overcome through training (Rieber, 1997).

In view of this phase 3 of this research has led to the objective to develop such 'intervention' (Mumford, Scott and Leritz, 2004) to foster creative production through digital media devices. On the one hand, from the constructionist perspective, the self-navigated curiosity of children should be respected – children must be allowed to explore, make, and try out things. On the other hand, the help of instruction, structure, and facilitation from an adult, as a mediator, a mentor, or a coach, can enhance the development of creative skills and creative production. A combination (Nickerson, 1999) of structure and freedom to explore and take risks has to take place to foster creativity in children when they engage with digital media devices. As phases 1 and 2 of this research revealed, rather than provide textbook material or pre-set exercises to practice when they used digital devices, as a typical lesson would go, the children should additionally be encouraged to create their own projects, while instruction navigates their work and follows their enquiry.

7.2. QUESTIONS RELATED TO THE RESEARCH PHASE 3

Phase 3 of this thesis posed three questions as outlined in Chapter 1. To answer Q1, whether the combination of constructionist approach with instructional framing enable creative production as children engaged with digital devices, the workshops designed for this thesis looked to identify children's behaviour and attitudes throughout the workshop tasks assigned to them which included engaging with digital media devices. That is, enquiry was made with regards to: (Q2) Children's behavioural and attitudinal indicators and processes when they engaged in creative production; and (Q3) the development of a framework that can foster such creative production.

Two qualitative methods were used to satisfy Q1, Q2, and Q3. One included assessing the participants' performance during the workshop. The second one looked at the participants' attitudes, including attention, motivation, problem-solving strategies, hands-on work and so on. Since creativity is not an easily observable construct, several indicators were used, as outlined by literature (Nickerson, 1999; Finke, Ward and Smith, 1992, Ward et al., 2002, Treffinger et al., 2002). The two methods comprised:

(1) Recording notes of directly observed cognitive (Ott and Pozzi, 2010) and metacognitive (Torrance, 1974; Runco, 1990 in Nickerson, 1999) behaviour. The observable data was recorded on a Word Document (Appendix E) in tables, which included:

a. The generation, planning and production of the participants' project (Anderson and Krathwohl, 2001; Finke, Ward and Smith, 1992, Ward et al., 2002);
b. The workshop participants' involvement with discussions and brainstorming (Yagolkovskiy, 2016), characters development, solution strategies and amendments, construction, and hands-on design when using the digital tools;

(2) Taking free-style observational notes of the participants' attitudes towards the various stages of their projects (Ott and Pozzi, 2010, 2012; Muhr, 2004).

The researcher of this thesis did the direct observations and made notes. The children's conversations were recorded with an audio mobile application.

7.3. WORKSHOPS STRUCTURE

Seven workshops were carried out among 21 children from private, church and government schools between 2015 and 2017 (table 7.1). The participants came from different socio-economic backgrounds and varied in ages from seven to ten. Each workshop consisted of three sessions on three non-consecutive days with one hour per session.

The workshops were consistently carried out in the morning, after the children had already had at least one or two lessons prior to the workshop. These never took place

at the end of the school day or prior to the participants' first school lesson. This was done deliberately in order to avoid the risk of working with sleepy or hungry children. Total elapsed time for each of the workshops exceeded the hour originally allocated for each session. Each participating school allowed more room for the children to finish their projects. The participants were also respected for wanting to continue on their designs. As their work progressed, the children did not want the workshops to end. This was evident when many of them commented in a similar way.

> I wish this never ended. I love being creative. (Boy, ten, government school)

> I love doing these pretty things, I can make this all day. (Girl, nine, church school)

> You should come and be our ICT teacher and let us do creative things, not copy stuff all the time! (Boy, eight, private school)

Table 7.1 Summary of workshop participants according to age, gender and school type

Workshop participants	Gender	Age	School type
Group 1	2 boys + 2 girls	Francesca, 10, Lisa, 9, Matthew, 10, and Ron, 9	Private
Group 2	2 boys + 1 girl	Emily, 8, Mark, 7, and Evan, 7	Government
Group 3	2 boys + 1 girl	Aiden, 8, Dawson, 8, Annabel, 10	Private
Group 4	1 boy + 1 girl	Patrick, 8 and Ellie 9	Private
Group 5	2 girls	Sandra, 9 and Bella, 10	Church
Group 6	2 boys + 1 girl	Jaeden, 9, Kawyn, 9 and Martina, 9	Government
Group 7	4 boys	Jayme, 9, Börn, 10, Mathias, 9, and Miguel, 9	Government

Each of the workshops followed a flexible structure. The list below does not follow a strict sequential pattern. For example, each workshop began (Day 1) with an introduction about the workshops and its objectives, while direct experience with the tablets and the apps as well as enquiry and case-based facilitation and instruction occurred with varying degrees, depending on 1) children's request for help or more information and instruction and 2) this researcher's observation and judgement when such information, instruction or facilitation was necessary to provide. Most importantly, the children were allowed to freely think up their own project and ideas.

1. Introduction
2. Project initiation

} Day 1

3. Direct experience, construction
4. Enquiry-based facilitation
5. Discussions, brainstorming

} Day 1,2, and 3

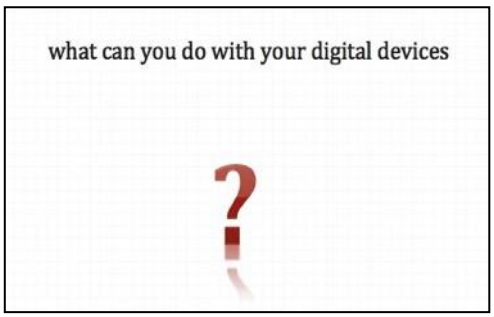
6. Demonstration and/or evaluation and reflection

} Day 3

During each workshop, the participants were invited to either pair with someone else from the group or work on their own. They were then introduced to a presentation, prepared and carried out by the researcher of this thesis. Called “Get Creative”, it explained:

1) What children like the workshop participants most often did with their digital devices;
2) List alternative uses and opportunities from engaging with digital devices such as a tablet and stress on the idea of making and creating, rather than consumption and interaction;
3) What digital devices, such as tablets, could afford children that they did not often know about; how digital devices could be used for other purposes, projects, and ideas; for making and creating things.

Screen grabs of the presentation slides:



is that all?

HOW ABOUT...

Connect, Collaborate & Create
Create & Give gifts
Share & Create
Sell & buy (why not!)
Create, Get inspired & Inspire
Speak up by creating
Create to make a change

a few things to talk about...

What are your favorite things to play with?

Do you like telling stories? If you were to create your own, what would it be and what will you use to tell it to others?

Do you like making stuff?

Do you like making stuff on your own or with a friend?

Do you like when others see your creations? Do you like when others tell you what they think?

What are the last things you made that your friends or family loved and talked about?

The first part of the presentation generally described how children, such as the workshop participants, used their digital tablets as identified during the thesis's earlier investigations. During each slide, the workshop participants were encouraged to discuss what they saw, whether they agreed with any of the statements, whether they recognised any of the apps and games shown in the slides, and what they personally used their devices for.

The PowerPoint's visuals were suggestive: They generally did not display explanatory texts, just images. This was done purposefully in order to see and record the participants' reactions, attitudes and behaviours – whether they would recognise any of the images in the PowerPoint presentation, what they would comment and say about them, and, in general, how they would react to any of them.

The majority of the participants across the seven workshops exclaimed the names or the games or apps they recognised. They commented what they thought of the games, apps or personalities they could identify. The below comments were common; the images of YouTubers like Dan TDM and KSI with over 15 million subscribers each (2017a and 2017b), app games such as Subway Surfer, Hungry Shark, Moshi Monsters, Five Nights at Freddy's, and shows like Try Not To Laugh, Just a Laugh, and the icons of YouTube and Wikipedia, elicited similar feedback among many participants across all workshops:

> KSI, I love him. Yes I know him. He says rude stuff sometimes. (Boy, 10, private school)

> That's Dan TDM, everyone knows him. He's really rich and he's very young. I want to become a YouTuber. (Boy, nine, private school)

> Subway Surfer! I love this game I have it, I have it! (Boy, ten, government school)

The second part of the presentation after "Is that all? How about?" presented other 'tools' that one could find on a digital device and how those could apply to creative production. Again, prior to stating alternative uses, the children were asked to give examples of their own. The majority of the children across all workshops mentioned more games or YouTube videos. For example, in Workshop 1, conducted in a private school, the children discussed various propositions:

> Francesca: Minecraft. You can create worlds; build things. I love Minecraft. Now after, when the holidays start I can play for longer.
> Matthew: You can watch stuff like, there's this 'You've Been Framed'. It's really funny. And the FIFA games, I like FIFA '16.
> Lisa: There's also 'Cut the Rope', that's really addictive. You can do maths on the tablet. Like, you can use your calculator maybe?
> Ron: On YouTube you can check videos how to make like something.

During Workshops 6 and 7 conducted in a government school, the children proposed their ideas:

> Jaeden: Minecraft and YouTube, you can watch if you want to make like engines.
>
> Martina: You can play games and listen to music.
>
> Mathias: We practice maths, we do mental maths. I told you already.
>
> Jayme: Minecraft! You can create towns and stuff. Whatever you like. I love Minecraft but not the pocket edition.
>
> Börn: You can…you can watch stuff. Like, on YouTube there are all sorts of videos about how to make something. You can play games.
>
> Mathias: That's the same, you have to make something.
>
> Miguel: Minecraft. You make stuff on Minecraft.
>
> Martina: I like the Cooking Panda. And there's another one, my restaurant…I forgot. But you can have your own restaurant and…
>
> Miguel: Yes, there's the sandwiches, you make food, like sandwiches and chips and you have people and they order food. So you make food.

The subsequent PowerPoint slides introduced alternative use for creative production. Demonstrations of several apps such as such as Foldify, Telestory, BookCreator, Sketches and Faces iMake were shown. Other examples were also discussed such as

creating and designing digital cards or video games, creating virtual environments to collaborate and connect with others, making blogs, videos, and other audio-visual content. Such alternative use seemed, to many of the workshop participants new. The children expressed excitement and curiosity. Common expressions included, "that's so cool", "I want to try it", "I'll download it" and similar. Patrick, eight, expressed his interest when he learned about Book Creator, the app that allows a user to create their own comic strips, books, or journals:

> Oh that's so cool, I want to write my own books! But can they be printed after that to look like real? I'm doing that with normal paper but then I staple it but then it doesn't look quite right.

While the presentation's aim was to avoid overwhelming the children and inundate them with too much information, the possibilities of what they could make with digital tools were discussed only when the children asked for more examples. For example, some workshop participants asked how one could make video games. In these cases the children were introduced briefly to Scratch, the website and resource for coding games and creating digital projects. This happened during Workshops 1 and 4. On the second day of Workshop 4 specifically, Ellie had initially asked to work with Scratch and successfully made a Mother's Day card. She subsequently asked to work on a new project. Nevertheless, her curiosity with regards to Scratch remained, in her mother's words, and since the workshop she has been learning to use the program.

Others also asked about how one could build an online shop or a blog. In those cases the children were given examples such as the eight-year-old (when he started; now twelve) Evan of EvanTube whose YouTube reviews on toys and things that his peers are interested in (Moss, 2014) have earned him over four million subscribers (YouTube, 2016); Adam Hildreth at the age of 14, who had built a social networking site and his Crisp software company (Lindner, 2009), which aims to protect children from online predators; Martha Payne's NeverSeconds website, which started off with her taking pictures of her school meals to grow into a global sensation, international awards and charity work (Mckenna, 2014) At least one of the above examples was discussed in all workshops following the participants' requests for examples of what users of digital tools could create. The majority of the workshop participants showed interest in what was presented to them.

The second set of PowerPoint slides aimed to present the digital devices as a 'toolset' that could allow the workshop participants to make gifts for others; to work on projects while collaborating and connecting with others; to make things such as audio-visual productions, stories, books, objects, drawings, games, and online platforms, such as blogs about various things of interest; to share things with others; to write and disseminate their own ideas and so on.

Admittedly, some of the tools the workshop participants were demonstrated must be purchased, not all of them are free at least not to use their full features. For instance, BookCreator allows the user to build a digital book or a journal however the full version of the application offers more features such as designs for making comic

strips. However, any craft, work, or idea requires tools and an initial investment. Such details were discussed with the children in the workshops.

Limiting the choice to five tools from which the participants could select to develop their project respected the wide choice as a variable that could pose difficulties among the participants in terms of getting on with their project (Amabile and Gitomor, 1984).

Four main parameters were used as guidance to selecting the applications proposed to the workshop participants as tools to develop their creative projects:

(1) Applications which allowed unstructured idea creation, brainstorming through social interaction, and idea development (Neumann, 2007; Gauntlett, 2011) and direct involvement of the children in their project (Barbovschi, Green and Vandoninck, 2013);
(2) Applications which could cover one of three fields: Writing, audio-visual, and artistic (drawing or a combination of audio-visual artistic presentation) but also a combination of those three, either of which could also allow the children to freely develop and create a project in written, audio-visual, solely digital or a combination of digital and physical formats in line with literature that is supportive of visualisation as aid to learning and creativity (Kim et al., 2016):
(3) Applications which can address the participants' interests, opinions, emotions, values, and attitudes (Anderson and Krathwohl, 2001);

(4) Applications, which are age-appropriate according to media organisations' and customer reviews (Common Sense Media, no date).

Table 7.2 Overview of the software applications that were demonstrated to the workshop participants

Name of application	Field for creative expression	Description of tool
Foldify	Narrative creation through visual and physical craft. Users can create their own story or play, design and print 3D characters and perform with them.	Creating objects and various characters, which can then be printed and folded into 3D (Pixie, 2014)
Telestory	Audio-visual creation: Children can experiment with audio-visual production; write their own script and role-play.	"Write, direct, and star in your own TV show" (Launchpad Toys, 2014)
Faces iMake	Collage-making by using everyday objects. Children can 'draw' by using various images of everyday objects.	"It is a tool for expanding visual awareness and visual associations" (iMagine Machine Israel LTD, 2015)
Sketches II	Drawing with "realistic drawing tools". Users can create, individually, or in collaboration, their own creative sketches or drawings.	An "exhaustive artist's toolbox" (Yann Le Coroller, 2016) which allows any artist to draw sketches, paintings and illustrations in a realistic way.
Book Creator	Through writing and adding audio-visual content children can design and write books.	Book application for the iPad (Red Jumper, 20145)

The tools were selected specifically to allow the workshop participants to craft or creatively develop a narrative – audio-visual or written or a combination – of their own and tap into their creative thinking and the need for making and creating (Gauntlett, 2011, 2015), the way creative writing has been used as a method to 'measure' children's creativity (Gardner and Davis, 2013) and the way other digital tools have been used to demonstrate creative potentials (Resnick, 1998, 2014, 2017) and the need for children to be allowed to tinker with, experiment and create (Martinez and Stager, 2013). The majority of the children interviewed in this study

highlighted their affection for and habitual use of digital devices to create photos, to draw, to make and to use audio-visual content – all forms of artistic expressions. This suggested that their habitual use would not be ignored during the workshops. Finally, allowing children to use tools that would foster their creative thinking – audio, visual, through writing, construction, or crafts – would permit general participation and not limit the workshop to have participants with specific skill sets only. Table 7.2 provides description of the tools.

CHAPTER 8

DISCUSSION OF RESEARCH FINDINGS FROM PHASE 3

8.1. INTRODUCTION

The effectiveness of the workshops was assessed by observing children's behaviour and attitudes from the initiation of their projects to their completion. There were several behavioural and attitudinal patterns that repeated across all workshops:

(1) **Project initiation**: The children either conceptualised their project ideas verbally or using pen and paper or wanted to try out the apps (Table 7.2), thinking up their ideas as they experimented;

(2) **Development of details and**

(3) **Desire to experiment with the digital tools**: Creating the details of their project, making alterations and finalisation of each detail/character/plot; experimenting with the digital tools could also happen from the project

initiation stage, as previously noted, some children chose to conceptualise while experimenting with the apps, while others preferred to conceptualise verbally or using pen and paper before they began using the tablet;

(4) **Questions and answers (Q & As), brainstorming and discussions**: Participants discussed their project in the beginning and during the practical, hands-on work. Children asked for help at times. At other times, the researcher of this thesis felt the need to encourage, veer, or support the project development and problem solving.

(5) **Gregariousness and positive emotions**: Spike of emotions and excitement to complete the project occurred toward the first and last day – a pattern evident across all workshops. This was evident when the participants were more than half way through finishing their project, when more work with the tablet was allowed and when the projects already started to take shape;

(6) **Imagining the unfinished project**: Along with their desire to demonstrate their finished project to family, classmates or their teacher, some participants led discussions surrounding an imaginative description of their finished work before they had finalised it and before they had worked with the digital tools.

(7) **Critical evaluation and reflection**: Reflection and evaluation of their accomplished work was prompted more than self-initiated. However, the children's increased confidence from experimenting with the apps, seeing their almost complete project, and discussing the possibility of demonstrating their work to others seemed to trigger gregariousness and enthusiasm. Gregariousness and enthusiasm were evident when the children discussed possibilities of demonstrating their work, of asking for more time to do new projects, and when they projected future ideas;

(8) **Excitement about audiences** acted as a boost to children's creativity and efforts to complete their projects. Many expressed excitement by repeatedly asking that they showed their finished projects to classmates, teachers, and parents. Statements like "my mom will be very proud of me", "my teacher will love it", "I want to show it to my parents", "everyone will love it" and "I want to show it to my class" were common.

(9) **Increased confidence** was strongly felt with Workshops 2 and 7, the two groups, on two separate occasions in two different government schools. These two groups of children worked with video production. They filmed themselves as the leading characters in their projects. The initial video attempts were unfruitful and the children seemed shy to perform before the camera. On the third day of their workshops, however, their attitude changed. They demonstrated confidence by speaking calmly in front of the camera, smiling, discussing openly how they wanted to re-do their attempts, then making new recordings with confidence and calm unlike during the initial attempts on the previous days.

(10) **Projections**: Many of the participants across all workshops demonstrated excitement by asking for new workshops to be set up, by suggesting to have their ICT lessons tailored in a similar to the workshops way, by suggesting that they worked on new ideas once they installed the same apps on their own tablets at home.

These indicators are in consensus with ones that have been acknowledged in literature (Rovai et al., 2009; Treffinger et al., 2002; Ott and Pozzi, 2010; Torrance, 1974). Specifically, past literature has identified the generation of ideas, planning,

production, (Anderson and Krathwohl, 2001), and reaction, and response (Rovai et al., 2009) as creativity indicators. Thus, generation of ideas, planning, and production resemble project initiation, developing the details of the children's projects and characters, and hands-on work with the apps, as identified by this thesis.

Reaction and response (Rovai et al., 2009) resemble the levels of gregariousness and the fluctuations in the participants' emotions throughout the three days of their workshops, as well as to the Q and As, brainstorming, and discussions the participants engaged one another or with the researcher as they designed their projects. These similarities in creativity indicators further allowed for the adoption and customisation of Ott and Pozzi's methodology of evaluating creativity generation (2010). Their methodology helped to mark where such behavioural and attitudinal indicators were present:

(A) Personally able and motivated to propose a solution
(B) Able to respond with solutions at researcher's prompts
(C) Unable to respond with solutions

Using these indicators facilitated the process of identifying each participant's attitude and behaviour throughout each workshop. Since the number of participants was small and the length of each workshop was short – lasting three days – the collected observable data with regards to the participants' attitudes and behaviour is only indicative of their creativity, as observed through the indicators outlined in this thesis.

The recorded direct observations during the workshops were not used to generate quantitative statistics. The observable data with regards to children's attitudes, abilities, and behaviour towards the workshops are summarized in Table 8.1. This table indicates the participants' attitudes, abilities, and behaviour from their project initiation to its completion. The values in the table are an accumulated average for each team or individual participant (those who chose to work individually). Where children received both A and B values this is to say that they showed motivation to propose personal solutions but also positively reacted to the researcher's prompts or facilitation when such aid was given.

Table 8.1 Behaviour and attitude indicators throughout the workshops

Behaviour and attitude indicators	Workshop 1	Workshop 2	Workshop 3	Workshop 4	Workshop 5	Workshop 6	Workshop 7
Project initiation	Conceptualised first	Experimented first	Experimented first	Patrick – conceptualised first; Ellie – experimented first	Conceptualised first	Conceptualised first	Börn and Miguel experimented first; Mathias and Jayme conceptualised first
Development of details	A	B	A	Patrick – A Ellie – B	B	B	Börn and Miguel – C Mathias and Jayme – A
Desire to experiment with the tools	A	C	A	A	A	A	A
Q&As, brainstorming, discussions	A	B	A	Patrick – C Ellie – B	A	A	A
Losing interest and becoming distracted	B	C	C	B	B	C	Börn and Miguel – C; Mathias and Jayme – B
Gregariousness and positive emotions	A	B	A	B	B	A	Börn and Miguel – C; Mathias and Jayme – A
Imagining the unfinished project	A	C	A	A	B	B	Börn and Miguel – C; Mathias and Jayme – A
Critical evaluation and reflection	B	C	B	B	B	B	B
Excitement about audiences	A	A	A	A	A	A	A
Increased confidence	A	Mainly on day 3 – A	Throughout all 3 days – A	Mainly on day 3 – A	Especially on day 3 – A	Jaeden – mainly on day 3 – A Martina and Kawyn – A throughout	Börn and Miguel – mainly on day 3 – A Jayme and Mathias – throughout A
Projections	A	B	B	A	B	A	A

The alphabetical values, reminiscent of school assessment grades, look rigid at first glance. Having assigned such values to the children is dangerous since it could lead to categorising the participants by ‘grading’ their performance, attitude, abilities, and

behaviour, as if they sat for a test and they only knew A, B or C amount. While A and B suggested some form of creativeness in solving an issue or coming up with an idea or a solution and C – failure to do so – this does not lead to the conclusion that therefore a child is or is not creative. The C only suggests that he or she did not respond to the prompt.

It must be noted that on day 1 of each workshop it was common for children to ask if they would be graded after their project was completed; if the workshops were some sort of assessment. The two participants from Workshop 5 – Sandra and Bella, nine and ten years old respectively, from a church school – asked their teacher, if they were going to be graded for their participation. Common questions included:

> Is this for some kind of test?
>
> Are you going to grade us at the end?
>
> Is this for ICT exam?

Accumulating a particular value A, B or C appears as though one is being compartmentalised as creative or non-creative. However, the end result of the workshops was not to compare accumulated scores and label participants as creative, more creative, or the most creative. The workshops did not aim to rank individual creativity. The children who took part in the workshops were encouraged to delve into creative production through digital devices aimed to engage them in a specific environment that is different from their classroom and – as evident from the findings obtained during research phases 1 and 2 – that is also different from their typical use at home. In such 'new' environment they were allowed to apply their own thinking,

attitudes, interests, personalities, and make their own decisions through experimentation, through questioning and by arriving to one meaningful end result – product or project – that was of their own making. For this purpose, the children were clearly informed prior to and during the workshops that these workshops were only a way for them to create something that was meaningful to them, that the workshops were not an exam or a test of sorts, and that there were no right or wrong answers in any way at any stage of their work.

Finally, using the alphabetical values for the small-scale workshops conducted for this thesis was to simplify compiling the observable data during each of the workshops. The alphabetical values helped the researcher of this thesis to designate the closest response the participant of each workshop gave or reacted to, based on (A) whether the participant initiated a solution, an idea, or an action on their own, (B) whether the participant responded positively to a prompt or a question posed by the researcher, and (C) whether the participant did not respond positively – did not find a solution or left a previous solution unchanged. Free notes were also taken along with the alphabetical values. The free notes related to the participants' behaviour, physical movements, comments, or actions they demonstrated during the workshops.

The main behavioural and attitudinal indicators that phase 3 of the thesis identified were:

- Project initiation
- Development of project details, experimenting with the digital tools

- Gregariousness and positive emotions
- Q & As, brainstorming and discussions
- Increased confidence and projections
- Critical evaluation and reflection
- Slump in enthusiasm, negative emotions and distractedness

These are explained in more detail next and also in relation with the values that have been given to each workshop in Table 8.1.

8.2. PROJECT INITIATION

After the PowerPoint presentation, the introductory minutes of each workshop, the participants across all workshops were asked to choose the tool they wished to work with and begin with their project. They could choose from any of the demonstrated apps (Table 7.2) to create a project of their own – a storybook, an audio-visual material, or objects with specific meaning as per the participants' own decisions and interests.

The participants could choose between working as a group, in pairs, or alone. Their objective was to develop their own project and complete it by the end of the three sessions of each workshop. Once the children from each workshop became acquainted with the apps of their choice, the participants were given a day to think over the type of project they wanted to work on and accomplish, and develop a

preliminary idea for a story or an object. Except for Workshops 1 and 2, all remaining workshop participants came up with their concept for a project on the first day. During the project initiation, the participants across all workshops demonstrated enthusiasm to begin their projects, verbalising their excitement by quickly starting to plan and come up with ideas, in some cases by asking to try out the apps right away, then suggesting ideas as they experimented with the chosen app, and, overall, by talking to each other – where children decided to work in groups – loudly; laughing frequently.

Table 8.2 Summary of workshop projects and total elapsed time children spent on their work.

Workshop participants	Project	Time (allocated time and elapsed time)
Group 1	The children worked together and developed a play called "School for Zombies". They designed 3D characters using Foldify. They developed their own plot, designed its characters, scripted, and performed the play in front of their class.	60 minutes/day; 3 non-consecutive days; Total elapsed time: 230 minutes
Group 2	The children worked together on audio-visual presentation, called "Valletta Primary Newsroom". The children performed as journalists; wrote their script and performed using Telestory.	45 minutes/day; 3 consecutive days; Total elapsed time: 180 minutes
Group 3	The children teamed to develop a fictional story, "The Story of Aidawrabel" – the name comprises parts of the participants' names. They designed 3D characters, printed them, photographed them and inserted them into a digital presentation.	60 minutes/day; 3 consecutive days. Total elapsed time: 200 minutes.
Group 4	Two children decided to work individually. Patrick, eight, created a short story, "The archer and his son" using BookCreator. He developed his storyboard on paper first; then worked the project using the tablet. He designed, scripted, and formatted his book, which he printed and demonstrated to parents and schoolmates. Ellie, nine, designed football-themed promotional clip using iMovie and camera. Ellie took video and pictures of herself during her football training prior to day 2 of the workshop to use as material for her clip. The remaining images that she used in her video were compiled by using the Internet.	60 minutes/day; 3 non-consecutive days. Total elapsed time: 200 minutes
Group 5	Two girls paired to create a self-promotional collage, using Illustrator for tablet. "What we love is who we are so people will know more about us when we show them the collage." The children used the tablet camera to take photos, Google – to search for general photo ideas and information.	60 minutes/day; 3 non-consecutive workshops. Total elapsed time 180 minutes
Group 6	Martina and Kawyn, both nine, created a "Pirate's Menu with Disgusting Dishes". They designed their imaginative dishes using Foldify. The 3D prints were photographed and placed as a presentation using BookCreator. Jaeden, nine, created a "mini crime series" using BookCreator. The completed project was a detective story in which a boy dreams up crime cases every time he goes to bed.	60 minutes/day; 3 non-consecutive days. Total elapsed time: 200 minutes
Group 7	Börn and Miguel worked together as school journalists, using Telestory. Mathias and Jayme created a comic strip using personal drawings (done outside the workshops), video camera, and BookCreator's comic strip templates.	75 minutes/day; 3 non-consecutive days. Total elapsed time 230 minutes

8.3. DEVELOPMENT OF PROJECT DETAILS AND DESIRE TO EXPERIMENT

Most workshop participants seemed to show excitement and engagement once they were given leeway to work on their projects. This reflected the average values given to each workshop as 'A' or 'B' as shown in Table 8.1. In the cases with value 'B' this is to say that the researcher of this thesis prompted the children occasionally. Those who were allocated a value of 'A' means that they worked independently and came up relatively quickly with an initial concept for their projects. The flow of novel thoughts – conceptualizing on a project – seemed to reflect several conditions that acted as precursors to children's creativity. These were evident across all workshops. Moreover, they also reflected some of the literature reviewed on creativity and learning. These precursors were:

1. **Opportunities for self-expression**
2. **Limited choice**
3. **Time pressure and goal orientation**

8.3.1. OPPORTUNITY FOR SELF-EXPRESSION

When invited to develop their own project that was of the children's personal interest, all workshop participants took such invitations with enthusiasm. For example, all children across the seven workshops expressed enthusiasm by either

immediately starting to suggest what projects they could work on or by asking to try out the various apps and see what ideas they could get after they tried them out. All workshop participants responded positively when given the opportunity for self-expression. Such positive attitude is supportive of literature on creativity within the classroom context. Giving voice and some form of control over the process of learning can be simulative to creativity (Davies et al., 2013).

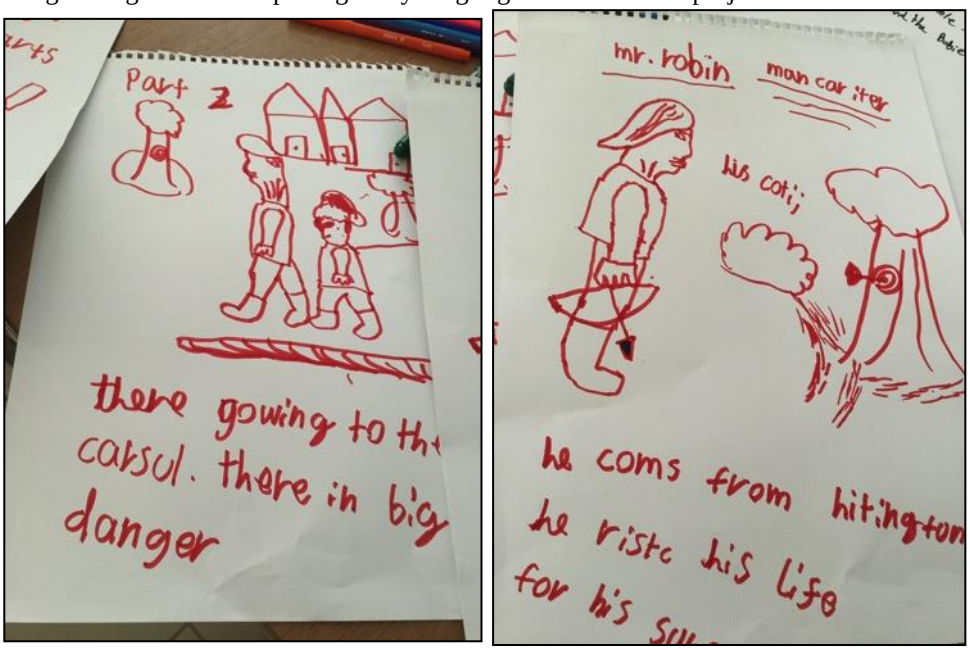
Another detail surfaced during the conceptualisation phase of the children's creative work. Throughout the process of conceptualising of their ideas, it became evident that some of the participants rushed to explore the various apps without having a specific objective in mind. This seemingly "fooling around" (Ejsing-Duun and Skobjerg, 2016, p. 84) and tinkering is equivalent to previous studies that have highlighted that such attitude to technologies is what makes children "bricoleurs, makers, hackers, hobbyists" (Ackermann, 2013, p. 121). During such tinkering and experimentation with the digital tool, the workshop participants would begin to verbalise their ideas. Through the tinkering and experimentation with the apps, ideas began to flow (Csikszentmihalyi, 1997). The more they experimented, the more ideas they seemed to be producing verbally.

On the other hand, some workshop participants seemed like they could have spent all of the time during the workshops trying things out without such experimentation leading to a 'concrete' or final project, as recorded during Workshops 2 and 7. This should not be interpreted as a negative result, but rather a description of the process in which these two groups worked. Specifically, Workshops 2 and 7 worked with video production. Both groups used Telestory, the video app, which allows the user

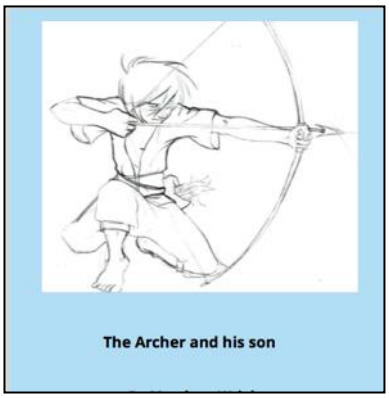
to impersonate a character of their choice, prepare a script, and speak and act in front of the camera and thus create a video clip or an audio-visual feature. The participants of both groups had no prior experience in filming or script writing. This posed further issues with the participants' ability to initiate a project. In both cases, the children experimented and made random 'takes'. Their work took off successfully with the help of further prompts, instruction, and support with suggestions, which was why, on Table 8.1 the rounded value in these two groups' cases is 'B' (the participants came up with solutions only after being prompted). The need for instruction from 'more capable peers' in order to see the fuller potential of creative thought was in congruence with the socio-cultural perspective of learning (Vygotsky, 1978, p. 86).

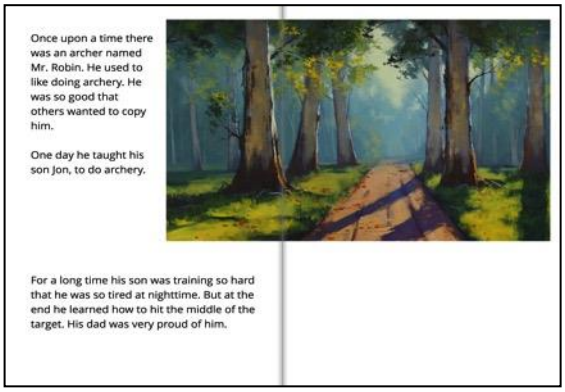
There were also other participants who preferred to work on their concepts first and then design and build using the digital tools. In those cases, the children resorted to pen and paper to structure their thoughts, to organise their story plots, to put down the details of their characters or their ideas so that they do not forget them. Such differences must be acknowledged and respected. They form part of the creative process in which a child engages when asked to work with digital tools for creative production.

Set of images 8.1 The images illustrate the conceptualisation of the project of the participant from Workshop 4. The participant preferred to use pen and paper for his conceptualisation of the story before using the digital tool and putting everything together into a final project**.**



Screenshots of the storybook, final project during Workshop 4





But one day the King of Hitington where mr. Robin and his son lived was walking past the forest and the king was looking for mr. Robin to speak to him. The King said: "I want to take your son to train my soldiers in my kingdom".

But Mr. Robin refused.
So the King threw Mr. Robin in the dungeons.

Jon went to the King and told him: "My father has refused me on purpose and I want to get back at him with all our soldiers, take him out of the dungeons and put him on a test to test his love for me."

The King agreed.

On the day of the test, Mr. Robin was ready. He was taken out of the dungeon and placed in front of the whole kingdom of Hitington.

He was asked to shoot an apple placed on his son's head without hurting his son. If he refused to do the test the King's soldiers will kill him.

He didn't hit his son but the guards still took him to the dungeons again.

Everyone from Hitington had to go to another country because the King became so violent that his guards were seizing everybody and killing people.

But Mr. Robin didn't obey the King. He escaped the dungeons and found his son and made up with him saying that he was sorry that he didn't want the King to ever take him to his kingdom. Hi son said: "I'm sorry I ever said bad words to you. I thought you didn't want me with you and s why you sent me to the king." They hugged each other and promised each other to fight together and restore peace in the kingdom. They went on to fight the bad King.
The guards meanwhile were too slow and couldn't

8.3.2. LIMITED CHOICE

When limited to choose and work with just one tool (app) was put as condition the all workshops participants seemed to focus more on their goal than on the digital devices. That is, the sheer volume of apps found on a tablet device was often distracting. An analogy of having columns of colourful apps tempting young users could be found with the way browsing and clicking on the Internet can affect important cognitive functioning (Carr, 2015). Constant clicking and obtaining snippets of information, being processed only on the surface can deny the user conditions for delving deeper into a subject and from there "conditions for creativity, for serendipity" (Turkle, 2015, p. 225). Restriction to the resources, as it were, seemed to foster mobilisation for the task at hand and focus on the task rather than on the tools. Such restrictions as to asking the participants to limit themselves to work with one tool only enabled the creative process. Such restrictive conditions have shown to foster creativity (Finke, Ward and Smith, 1992; Tan, 2008; Nickerson, 1999).

8.3.3. TIME PRESSURE AND GOAL ORIENTATION

The workshop participants seemed to work in a more organised manner when they were frequently reminded of their limited time to complete their projects. This is supportive of literature with regards to channelling constraints that can help people "to efficiently focus their resources, such as procedural instructions and task

structure" (Roskes et al., 2012, p. 197). Other literature has shown that putting various constraints can positively affect the generative and explorative phases during a creative task (Costello and Keane, 2000; Finke, Ward and Smith, 1996; Moreau and Dahl, 2005; Finke, Ward and Smith, 1992). Putting constraints on certain inputs can lead to creative processing (Moreau and Dahl, 2005). The workshop participants seemed to organise themselves, designate roles, responsibilities, and tasks, and work in a structured way. For example, below, the conversation among Workshop 3 participants demonstrates how children organised themselves in the face of time constraint. Annabel, ten, as the oldest in the group with Aiden and Dawson, both eight, seemed to take the leadership role every so often and designate various tasks:

> Annabel: I'll write down the characters to know what to design. We have to design them after that. Then we can print all of them?
>
> Aiden: I want to do them on the iPad!
>
> Dawson: Even I want to!
>
> Annabel: Ok, let's take turns. Even I want to. Dawson, you can design some and then Aiden and me. Then, we can print them, and then…so, we need to make the planet and the babies and first we need to design our alien.

The reminders of their projects' deadline was as a result of situations in which the children seemed to lose focus, even interest and efforts, at times. Here a distinction must be made with regards to approach and avoidance motivation (Roskes et al., 2012; Elliot, 1999, 2008). While some literature suggests that time limitation can

thwart creativity (Amabile, Goldfarb, and Brackfield, 1990), others distinguish between the ability to avoid failure by focusing on the positive challenges – such as on the success and the achievement of putting efforts in times of limited resources (Roskes et al., 2012). In such situations when a person is avoidance motivated, factors such as time constraint can often hinder creativity the focus shifts on negative consequences such as fear of failure (Roskes et al., 2012). Similarly, children focusing on performance goals – where they anticipate failure – tend to perform worse in creative tasks (Tan, 2008). While time constraint was a present factor during the workshops, the participants were clearly informed, subsequently and frequently reminded that their 'work' was not an examination of any kind and that there was no right or wrong in their efforts. In other words, the participants were steered to focus on their goal – on making something they cared about – and not on their aptitude – on performing an elaborate or complex design. This triggered positive energies in that many children themselves expressed eagerness to see the end result of their project by discussing possible scenarios of presenting their final work to parents, to schoolmates and to their teachers.

In the course of work many children often resorted to everyday objects, situations, or ideas from their immediate environment. Being reminded to not think of "right or wrong" and to create by thinking "outside the box" – as a way of suggesting to them to focus on the goal of just creating something meaningful to them and not on their performance, the children responded imaginatively and creatively. For example, Workshop 1 participants wanted to create a story about zombies attacking a school. Having designed the school vans – some of the characters in their story – the children were challenged by the question why the designs seemed too 'everyday'.

Researcher: Aren't these a bit too ordinary vans? They look like the real ones. Think 'outside the box'. Design them the way you want.

Francesca: Really?

Researcher: Yes, be as imaginative as possible.

Matthew: What do you mean out-of-the-box?

Researcher: You don't have to make the van exactly as your real school van. You can give it just about any feature. You can make them fly, or talk, you can design and colour them any way you wish.

Francesca: Wow, I want to … I want to. Let's add mouths. They're eating the children when the children get in.

Lisa: Oh my God that's great…the mouths are instead of doors.

8.4. GREGARIOUSNESS AND POSITIVE EMOTIONS

Throughout the workshops, most participants expressed gregariousness and positive emotions either by talking loudly and freely, that is, not waiting to be asked to speak, and by frequently laughing, engaging in casual talk with teammates – a behaviour atypical for them if they were attending a school lesson, where they would have been required to sit quietly and speak only when asked to. Some expressed their

excitement about the workshops by saying that they wished these did not end, that they could do such projects more often, and that they wished their ICT lessons included such creativity workshops. As Table 8.1 shows, most workshops were marked with value A. This meant that the children freely expressed their positive emotions through words or the casual, gregarious behaviour. In two cases, however, Workshops 2 and 7, the participants were marked with 'C'. Since both groups, separately, worked on video production – writing a script and filming themselves – the encounter with camera seemed to discourage them and make them shy and uneasy. Yet, what is noteworthy, in both cases, the children refused to change the tool even when they were offered to do so.

In other cases, the participants' enthusiasm as a creativity indicator, was expressed not only physically – the way the children spoke and behaved energetically but also by explaining that they had spent their free time (between workshops), discussing their projects among team members (workshops 1, 6, 7, 3) or with their parents (workshops 4, 6, and 1) or with their teacher (workshops 7, 5, and 1). Many expressed their enthusiasms by retelling how they had spent talking about their projects throughout the days prior to or after the workshops.

> Francesca: Miss, we've come up with a super cool idea. You'll love it!
>
> Ron: It's called School for Zombies.
>
> Francesca: Wait! Let me explain. Don't tell her the name yet.
>
> Francesca: We've been working on it all night yesterday and during break. We haven't stopped thinking about it. So, the

children in the school will be eaten; they'll be attacked by zombies and there'll be these kids with special powers.

In the cases with Workshop 1 and Workshops 6 and 7 the class teachers, too, confirmed the children's enthusiasm in a similar way:

Ms. Lorraine (general subjects teacher, government school): They haven't stopped talking about your project. They're so happy and have been going on and on the whole day yesterday. They've been really excited since yesterday. Thank you so much. Can we see the end result, please? …They are really, really exited. They've been waiting for you today!

Ms. Marjorie (ICT teacher, private school): What is this they've been asked to do? Can I use it for my class? The children haven't stopped talking about it. They're making like a play with 3D figures they said? … They haven't stopped talking about it. They've made me curious.

8.5. Q & As, BRAINSTORMING AND DISCUSSIONS

The brainstorming sessions across all workshops were predominantly lively, noisy and, at times, difficult to follow the conversations of the children as they often spoke at the same time, trying to outshout each other. Those participants who chose to work on an individual project resorted to quieter work (Workshop 4). Here Patrick was marked with a value of 'C' (Table 8.1), as he was not able to come up with a solution or an idea. Again, this is not to say that the participant 'failed' in something. For example, Patrick was unsure why the king in his story was so bad and killing everyone in the fictional village. Not responding to external prompts and unable to create a solution on his own, Patrick decided that the story was as good as it was, leaving such a detail – the motivations behind his character's behaviour – out.

Other participants, as Table 8.1 shows, had a cumulative value of 'A' or 'B'. This is to say that they responded positively to external prompts, Q&A sessions and, at times even arguments (during Workshop 3). On the one hand, brainstorming seemed to enable problem solving and the generation of ideas (Osborn, 1979) among some participants. Collaboration precipitates creativity (Csikszentmihaly, 2013; Sawyer, 2006). On the other hand, even though past research has demonstrated that group collaboration contributes to improved problem solving and improved performance on various tasks (Hill, 1982; Van Knippenberg and Schippers, 2007), not all participants agreed to group work and brainstorming as the preferred method of work as was the case with Patrick during Workshop 4. This also supports research

that has argued that brainstorming and group work can stifle creativity (Diehl and Stroebe, 1987, 1991), acknowledging the quality of individual idea generation (Nijstad et al., 2006; Stroebe et al., 2010). Again, such differences from one child to another come as a reminder of the individual ways of learning and development that can be subdued by routinized and standardised educational system (Resnick, 2017).

The majority of workshop participants demonstrated that brainstorming and collaborative work helped in the navigation and construction of their project ideas. Specifically, collaborative work seemed to positively affect creative work by enticing children to exchange ideas with one another, to be gregarious, to use humour in their suggestions, and to be highly experimental with their designs. Moreover, collaboration and brainstorming seemed to encourage group work to deepen their efforts and ideas, not settle with the first idea that occurred or was proposed. For instance, the following conversation went during the brainstorming session among the participants of Workshop 3 while the children, Aiden, Dawson, and Annabel, worked on their "Story of Aidawrabel":

> Annabel: What shall we call him?
>
> Aiden: Let's combine our names!
>
> Annabel: Ai…Anna…Daws… Adorable? [She writes "Adorable" on a large piece of paper]
>
> Dawson: Spell our names as they are, Annie!
>
> Researcher's notes: The children design their character using Foldify. They don't really have a clear idea about the story but they want to try the app anyway. From Adorable, they

change to Aidawrabel. This anagram represents the first part of the children's names.

Annabel: Let's make it half-boy half girl

Researcher: Where did it come from?

Aiden: It came from Mars

Annabel: From Mars, as if. It came from… it crashed from

Dawson: Pluto!

Annabel: No!

Researcher: How about you invent your own planet?

Annabel: It came from Yama

Aiden: Java?

[Screaming and laughter]

Dawson: That's like from Star Wars.

Annabel: No, it's called…

Aiden: Yama something…

Annabel: Yes, Yama Jama.

Dawson: That's cool! Yama Jama.

Annabel: It's not going to be round. It's an octagon.

Dawson: No, it'll be with corners, like a square. Let me do it!

Aiden: Yes!

Aiden: Add a face. It has to have a face…like, when it's attacked it'll be angry…

Dawson: Yes, and when the planet is ok it'll be happy it'll have a happy face, a happy face, Aiden, on the other side, put like a smile.

Annabel: The planet is in danger, Aidawrabel … he plants the diamond, the planet has a diamond, that has been stolen…

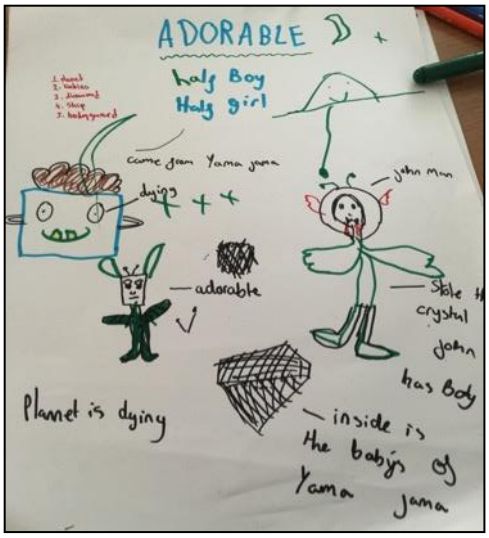
Aiden: No, he…like…has to go to our planet to get the diamond back. It's been stolen and the diamond is like his planet is dying without it.

Annabel: We need to create Aidawrabel. He has to be like really weird to look alien. Put horns as hands.

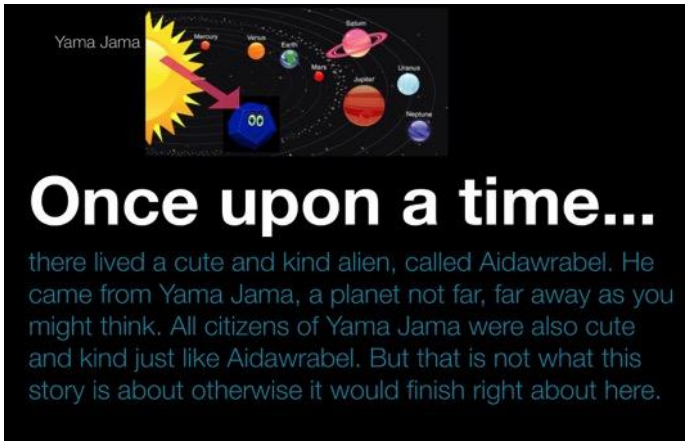
Aiden: Make him half-robot, half alien, half-bull, half-fly.

Annabel: No, half-butterfly, we'll add wings, so he can fly. He'll have these properties depending on when he wants to use his robotic skills or his bull skills.

Set of images 8.2 The initial name of the story was “Adorable” however the children changed it to “Aidawrabel” to capture the first three letters of their names. The points in red represented each of the characters in this workshop’s project, which the children eventually had to design using Foldify, the software app for making 3D objects.



Screenshots of the final project of Workshop 3 participants: The children created their story by using Foldify, making each character in 3D, printing these out, gluing them together. Each 3D figure was then photographed and the images added onto a slideshow on an iPad. The screenshots show the full story the children created and also the images of their 3D figures.



The weird pond...

One sunny day Jonman landed on Yama Jama and walking about he stumbled upon a lava pond. He was very intrigued that the locals were swimming in the pond. He decided to dip his feet, too. While he was swimming in the lava, he noticed that something sparkle-glittered at the bottom of the pond...

The crystal was stolen ...

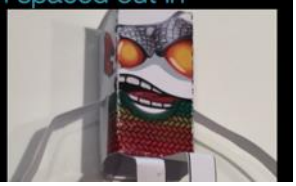
The sparkle-glittery thingy was so attractive that Jonman, the spaceman, couldn't take his eyes off it. But because he was a bit scared of the deep, he asked his bodyguard, whose name was Can'ya to jump and pick up whatever it was at the bottom of the lava pond.

Can'ya

He told her:"Can'ya, can ya go get it? It will be your gift from me to you." How selfish and low, the reader would think. How selfish and low indeed. But then, if he wasn't selfish and low, we wouldn't have a bad guy in the story now, would we!

Bored spaceman...

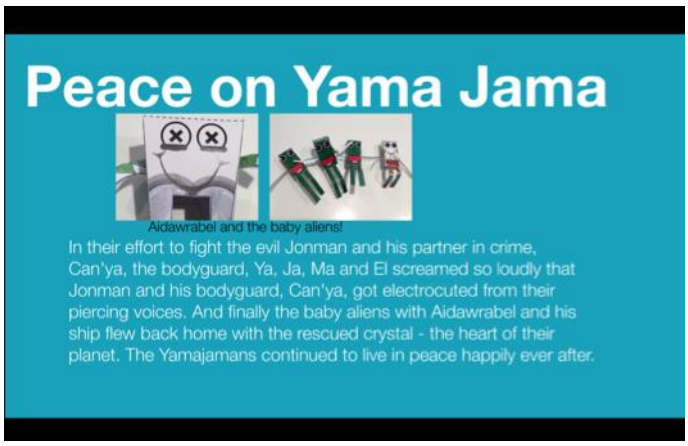
The bored spaceman, Jonman spaced out in space when...



The war begins...

As soon as the crystal was picked out of the pond, everything on Yama Jama started to turn dark and then into ash. The Yama Jamans were starting to turn into ash, too. Only one managed to survive - Aidawrabel. Why? Because he was having a bubble bath. A real, soapy, watery bath made of water and ... soap, apparently. So, as it turns out, Aidawrabel was the only one available to go rescue the crystal and restore life on his planet, Yama Jama.

Aidawrabel's spaceship.



Brainstorming and discussions was an indicator of creative flow for the other workshops, too. For example, lively debates and discussions helped Workshop 1 to create their original project using Foldify and then a live performance for their class using the 3D figures.

Matthew: Our school is attacked by zombies…even our minivans [the school transportation] have transformed into zombies that eat the children.

Francesca: And the teachers, too, have turned into Zombies and they attack the kids and try to eat them.

Researcher: Who is the main character or characters in the story? Will there be anyone to save the school children from the zombies? What is the middle of your story and how will the story end?

Ron: There are those four kids who, like, have special powers.

Francesca: Yeah [screams], and like they'll be like one will have water powers and fire and stuff.

Ron: And Tire powers…

Researcher: Tire?

Matthew: Yes, yes, Tires, he'll be throwing tires not fire. Fire is like the movies, ours is different!

Ron: And like one with magnetic powers and…we can have fire, why not?

Matthew: No, it's like the Avengers, I don't want fire.

Ron: Then how are you going to kill the zombies?

Matthew: They don't have to be like all the zombies in the movies. These can die by …if you attack them, you can kill them with other stuff.

Matthew: But there'll be fire in the school and then…

Francesca:

And the water, the…my character has water powers, and she'll put out the fire. And…and wind powers, one will have like, he can blow like really strong winds with his mouth.

Set of images 8.3 Workshop 1 in the process of creating their story characters

Prompting, facilitation through questions and answers and brainstorming supported the creative process as expected. Additionally, such prompting seemed to keep the children in focus and encourage their creative thinking to surpass the first ideas that crossed their minds. Most of the participants across all workshops initially offered more 'conventional' ideas for their projects – things that stemmed from already existing knowledge (Workshop 3 initially considered Mars as their main character's home planet) or things they borrowed from their immediate environment (Workshop 1 took place in a classroom; their story related to school).

Nevertheless, prompting and 'priming' (Rietzschel et al., 2007) helped the children to break away from their initial ideas or at least elaborate in more novel ways. This was supportive of literature which, while agreeing with Ward's model of path-of-least-resistance (Ward, 1994) in generating novel ideas, through brainstorming, such ideas were subsequently 'removed' from "the pool of potential ideas" giving way for more original ideas [to] be generated" (Stroebe et al., 2010, p. 184).

Brainstorming did not solely involve the workshops participants. Questions, answers, prompts, and discussion of possibilities and ideas were facilitated by the researcher – in the role of 'expert other' or as the facilitator. Research showing that 'priming', a method of brainstorming session through open-ended questions, can induce deeper exploration on a particular subject or a problem (Rietzschel et al., 2007). Similarly, the participants in each workshop responded positively when prompted and facilitated through open-ended questions by leading children to continually rework and introduce novel details to their plots or characters. In Workshop 3 a prompt took the children to debate regarding the logic of why certain things were happening or how certain events had to unfold.

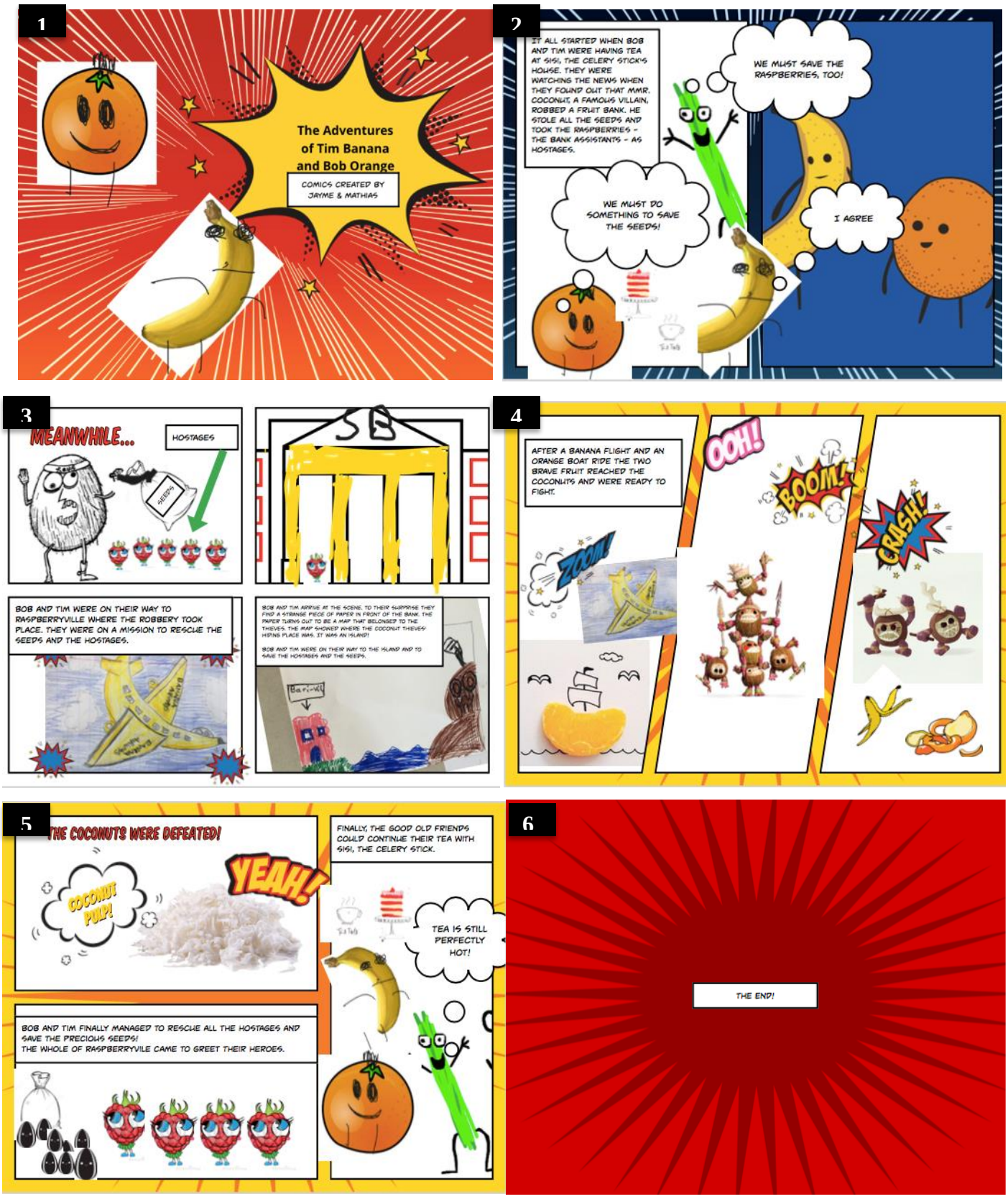
> Dawson: Why would Jonman steal the necklace? He has to have a reason, Annie!
>
> Annabel: Well, because he was greedy.
>
> Dawson: That's not enough. We need something like he didn't have a choice or something…
>
> Aiden: He needed money so he had to sell it on Earth.

> Dawson: That's stupid, he can steal stuff on his planet. There has to be some logic in it. Otherwise when people read it they'll say, 'ah, he could have done that…'
>
> Annabel: How about, how about, because it had special powers and no other crystal on his planet could have? The lava pond, everyone could swim in the lava…
>
> Aiden: Yes, exactly, the lava pond was like turned into water and the aliens could swim in it because the crystal was inside. That's the special powers it had. It could transform things.
>
> Dawson: That makes sense. Yes, and his, and the planet, planet Earth is ailing so he had to find a special cure and the crystal was it.

When the workshop participants were prompted with questions or asked to think of solutions to a problem – say, an inconsistency with their plot or character – that they should think about before moving on to a new task or before deciding that their work had been done, most children seemed to grasp such challenges by trying to propose solutions or more details to tackle the prompts. For example, during Workshop 1, the children were asked to think about what a zombie teacher would look like in terms of strengths and weaknesses, which could later help them decide how the protagonists would fight the foe, the workshop participants seemed to accept the question as aid to their thinking. Their focus shifted to discuss and imagine the details of their story's antagonist, then design it using the digital tool.

Similarly, during Workshops 6 and 7 the children were encouraged to think about the inception in their plots, about the reasons behind the problems occurring with their characters, about the ways in which such problems could be tackled. In many instances, the participants would then take over and ask questions among each other and commence heated discussions.

Set of images 8.4 Workshop 7 and their comic book creation using Book Creator on an iPad



Prompting through questions facilitated all workshops overall. For example, Ellie's individual project for which she wished to express her fondness for football involved prompts about why she loved the sport, how she wanted to convey the message – she chose to make it humorous – and how she was going to carry out this message – for which she decided to take some photos and a video of herself during her football practice. The prompts involving what she liked and disliked took her to the idea of creating juxtaposition between the crystal slipper and fairy tales' gender stereotyping (Garrett and Tremaine, 1977; Green, 2012) versus the freedom to explore things regardless of gender. This thinking led the nine-year-old participant to create, using iMovie, an amusing one-minute video clip, which she eventually demonstrated to her class and her parents, and asked to do more workshops so she could make more of these videos.

Set of images 8.5 Ellie's (Workshop 4) promotional video using iMovie, camera and the Internet for images and text

Frame 1

Frame 2

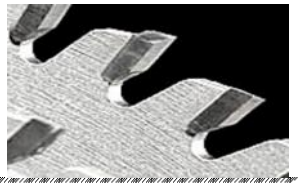
Frame 3

Frame 4

Frame 5

Frame 6

Frame 7



Frame 8

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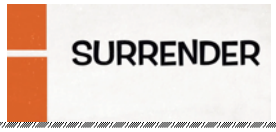


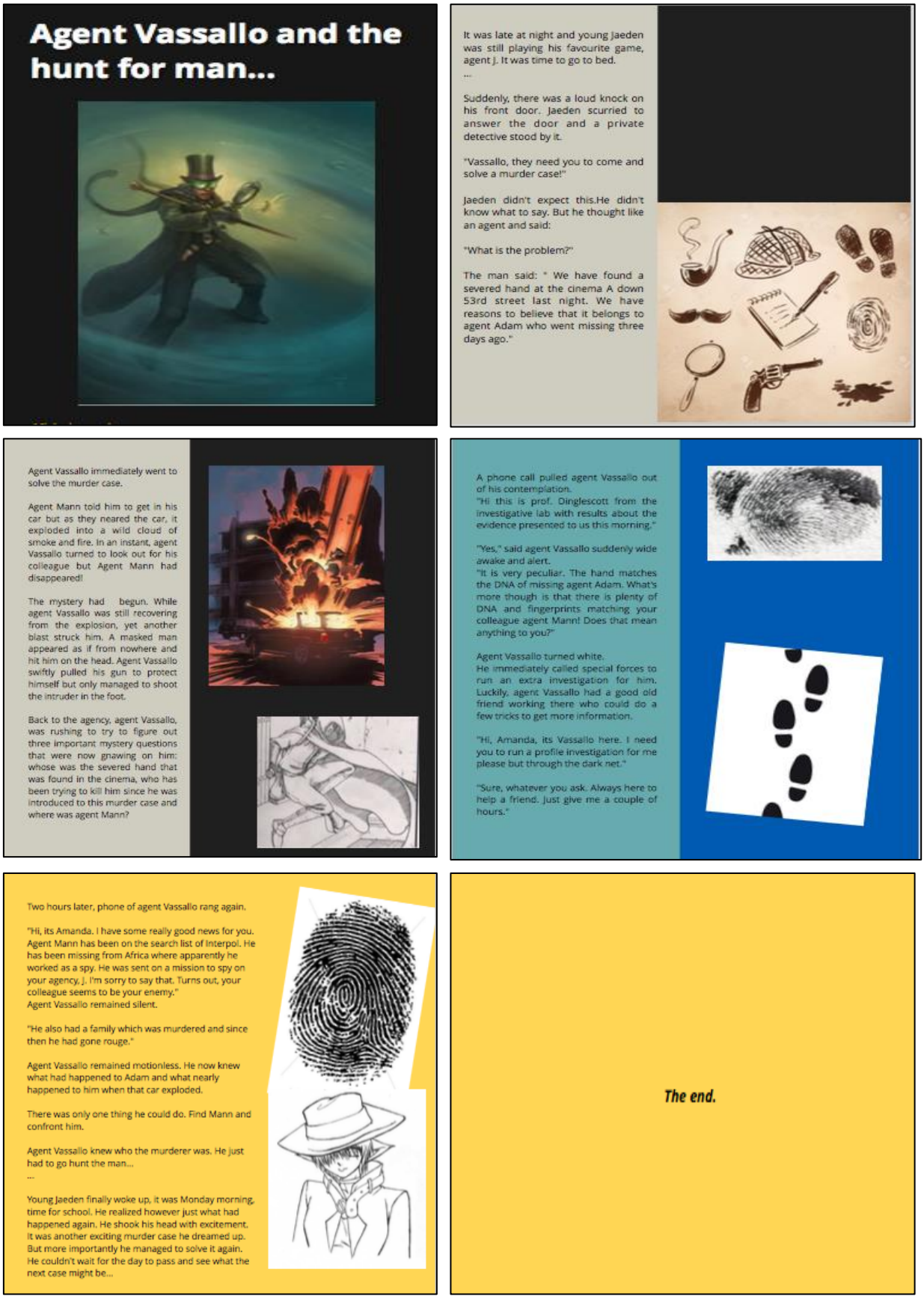
Frame 22

Frame 23

During the individual work of nine-year-old Jaeden, the query-based discussion was helpful, as he himself confirmed it:

> Miss, when you ask me it helps me a lot to think, like, when you ask me about the, when it's not, when it's not making sense and then, it helps me think better about to make sense.

Set of images 8.6 Snapshots of Jaeden's' creation using Book Creator on iPad



8.6. INCREASED CONFIDENCE AND PROJECTIONS

Many of the children demonstrated increased self-confidence on the last day of the workshops. This is reflective of literature about the connection between creativity – exploration and willingness to take risks – and confidence (Nickerson, 1999). This was especially evident during day 3 of all workshops when the children were ready with their projects. Specifically, increased confidence was evident among the children who worked on video production: Workshops 2 and 7. While on day 2 the children of these two groups felt shy and uneasy about filming and speaking before a camera, even a slump of enthusiasm was noticed (discussed in the following section), on day 3 of their workshops the participants of each of these two groups had changed their attitude and filmed with apparent ease and confidence.

For example, the boys of Workshop 7 initially chose to sit in a secluded corner of the school gymnasium (where the workshop took place), where they took 18 random, incomplete, and unscripted takes with Telestory, the video app. These attempts mainly showed the boys giggling, shying away from the camera and making undistinguishable noises. With prompts and discussions initiated to encourage creative thinking, the two participants planned a story, wrote their script and recorded it twice back in the remote corner. Unsatisfied with their two new attempts, the participants took two more final takes this time near the researcher, without returning to their corner. As evidence to their growing confidence, during those last two final takes, the two participants spoke calmly and with confidence, a complete transformation from the takes prior to those two.

The majority of the workshop participants also wished to demonstrate their finished work to parents, classmates, or teachers. While some literature has highlighted the constraints on creativity when "the expectation that one's work will be judged and compared" (Hennessey, 2010), here the expectation that parents, classmates or teacher would see their final work seemed to charge children to finish their projects and to make them "super amazing" and "cool" and "original" in the children's words. Such desire to demonstrate their final work was also a reflection of the children's positive attitude and response towards the workshops.

The audience as a factor to boosting creative work also linked with the children's frequent discussions of how they imagined the unfinished project – what it would look like, where they would want to keep it and whom they would show it to. The two participants of Workshop 5 imagined their personalised collages as a form of personal identity badges. They discussed the ideas of making such personalised badges to all their friends and classmates. In other occasions, Jaeden and Patrick – Workshops 6 and 4 respectively – imagined their future books, printed, bound, and turned into series. The audience as factor that boosted creativity was evident through the children's frequent discussions about their expectations of positive feedback they would receive from friends and family about their creations. For example, Jaeden said several times throughout the workshop that he wanted to show his book to his mom and his class.

> My mom will be very proud of me. She knows that I write.
> But this looks like the real thing. I want to show it to her,
> Miss. Will you be able to print it for me or send it to my

> teacher so she can have it in her computer? Ms. Leanne will also be able to show it to the whole class, we have the interactive white board and she can project it with her computer.

Ms. Leanne (teacher of the children from workshop Workshops 6 and 7), too, reflected on her students' final work from their workshops, after having seen the complete projects, in an email:

> Wow!!! What lovely work they've produced!! Thank you so much, they enjoyed it and the sessions were super beneficial for them too! I will show their work to the rest of the class tomorrow as they've been asking me to do so.

Finally, the last recurring element during the workshops, especially pronounced through conversations and discussions among the participants and between them and the researcher, was their projection and long-term planning about doing future work similar to the workshops. Once the children saw their finished project, it encouraged them to think about new projects they could work on next. For example, Sandra and Bella expressed their future wishes by suggesting that they could design such visual profiles – 'badges' – for their classmates. Patrick from Workshop 4 shared his future plans as a result of his excitement from his finished project:

> I want to make new and new ones every time. I've never written so much before…I want to make a new one about archery again but it will be different this time.

Such projection and future planning happened on the third day of most of the workshops. As a form of reflection on what the children had created and how they felt throughout the process of their projects, in comparison to their initial expectations and feelings, most of the participants demanded that such workshops happened more often, or that similar ones took place in their schools on a regular basis.

8.7. SLUMP IN ENTHUSIASM, NEGATIVE EMOTIONS AND DISTRACTEDNESS

Negative indicators were also recorded during the workshops. For example, a slump in enthusiasm, arguments, and distractedness – deviation from a project that was already taking form – were noticed during Workshops 2, 3, and 7. For example, distractedness was noticed during Workshop 3 while the story plot was nearly ready.

> Dawson: Shall we, instead, take a necklace?
>
> Annabel: Who? Jonman? No, we decided it's a crystal.
>
> Dawson: He runs on an island and he finds a skeleton, he throws it into the lava pond and then he jumps on the skeleton…he's, no, he's on an island on the Earth…

Annabel: He's on the Bermuda Triangle. [The children laugh]

Researcher: you already decided Aidawrabel lives on Yama Jama and that the crystal is in the lava pond…You already made the planet. What happens when…

Dawson: But he's turning into a skeleton…

Annabel: What skeleton, Dawson? He's half-robot, half-alien.

Researcher: Let's focus on the story again. Where is the alien, Aidawrabel? Let's design him first. You have the planet ready. You need some…you said he's half-robot? Let's design him and…

Aiden: Yes, half-bull, half-butterfly.

Annabel: And half-alien.

Researcher: You still don't know how he will get his crystal back from Jonman the bad human.

Dawson: He goes back to the island.

Annabel: What island, Dawson? He's on his own planet. They'll be in space and they'll fight there.

Those participants, who preferred to try out the digital tools before they conceptualised their idea, seemed more likely to get distracted and not start on a project at all. This is not to say that exploration and experimentation with the digital tools before an idea is conceptualised leads to a negative conclusion. However, there is no guarantee that exploring and experimenting with a tool would necessarily lead to anything concrete either (Lemerise, 1993; Clements and Sarama, 2003).

Being distracted occurred among the participants of Workshops 2 and 7, who wished to work with Telestory, the video app. The children seemed to act distracted and lose interest in developing a coherent project initially as they took random recordings with the app, as mentioned earlier in the text. These two groups of participants had to be repeatedly reminded to work on their project as the end of the workshop was nearing.

In these cases, as with Workshop 3 (only for a short moment during day 2), and Workshops 2 and 7, who showed distractedness and inability to come up with more solutions or ideas received a value of C, as shown in Table 8.1. The children in those instances required frequent reminders and facilitation to help them refocus their attention on their projects. Questions as a form of facilitation became helpful to these participants. Prompts related to their projects acted as anchors that steered them back to their main objective.

These observations during the workshops further led to the conclusions that, in the cases where distractions occurred, there was at least one participant who took the leading role to bring the 'distractor' back to the task at hand. As the conversation with Workshop 3 above shows how team members became increasingly distracted, Annabel, as the oldest in her group, took the role of the leader and attempted to control her eight-year-old teammates. This suggests that such situations present opportunities for learning invaluable social skills as the children learn to deal with various behaviours, attitudes, personalities, tasks as well as situations when asked to work in a team. The workshop participants collaborated with others; dealt with frustrating feelings when they had to share the digital device; they practiced social

skills when they engaged and collaborated; they learned how to overcome such frustrations and having to share.

Distractions or slump in enthusiasm did not occur among all participants. Those children, who wanted to work on their own, not in a group with others, demonstrated more focus. For example, Ellie (Workshop 4), and Jaeden (Workshop 6), and in a group of two, such as Sandra and Bella (Workshop 5), and Martina and Kawyn (from Workshop 6) seemed even more immersed in their work on day two as they started using the digital tablet. They also did not seek for the researcher's prompts and, equally, there was no indication, direct or implied, that they needed facilitation. The participants discussed ideas, details, and options with one another– in the case with the pairs of participants in Workshops 5 and 6 – or searched and designed their projects on their own without asking for external help, in the case with the individual projects of Patrick, Ellie, and Jaeden. This more focused behaviour therefore responded better to prompts, problem solving, and coming up with ideas – therefore obtaining a value of 'B' as shown in Table 8.1.

The workshop participants also tapped into different subjects and fields, supportive of constructivist theory with regards to the interdisciplinary approach to learning (Resnick, 1998). For example, the children who worked on audio-visual production enquired about the ways in which journalists work. Workshop 3 children discussed physics and astronomy – they wanted to understand how planets formed. They researched information about planets and whether one could live on a planet without oxygen.

Furthermore, what seemed important to the children across all workshops was not so much the aesthetics or the format of their work but that they *did* come up with an idea of their own. How the characters looked, for example, seemed secondary to children, compared to developing the very idea of their characters and the story plots in general. This highlights yet another difference between children's perspectives for creative production and teachers' or parents'.

8.8. CONCLUSION

The participants' feedback was important because it gave a perspective of the general feeling after they left the research workshops. What they experienced throughout the process of creative production with digital devices contrasted with what most of the workshop participants felt about their experiences with digital tablets in class. There were no evident differences with regards to the expressed feedback in relation to gender and socio-economic status. The children from Workshops 1, 2, 5, 6, and 7 already used tablets during their school lessons. These children were familiar with tablet use in the classroom. Nevertheless, some of them lacked enthusiasm regarding how these tablets were used in class. The children's perspectives differed from how they used the devices at home and now, during this thesis's workshops. Prior to the workshops the children discussed and demonstrated what they did with their digital devices in the classroom. Their responses veered towards main school subjects such as maths, English, Maltese, and religion. The children already studied maths, English, Maltese, and religion before the tablets

came along. The tablet gave an additional opportunity for these children to practice these same subjects through game-like exercises. The descriptions of these practices, nevertheless, included children's openly negative opinions with regards to the control the teacher exerted over how and what for the tablets could be used. This is reminiscent of what Mitchel Resnick has argued: that the teachers "transmit new information to the students" (Resnick, 1998, p. 44-45). Yet again, teachers seem to be transmitting to the children the type of use of the digital tablets leaving no room for expression on what else these devices could be used for, or perhaps even how children themselves might want to use them.

Most conversations with the workshop participants surrounded the types of applications they had to engage with, not so much the actual subject matter – a particular theme or a topic. The children talked about multiple-choice tests in the form of games such as Kahoot or PowerPoint and Excel programs without referring to any subjects specifically except for the general titles – 'maths', 'English', or 'science'. They did not discuss specific problems or themes within these fields that were being investigated – and how that may have happened – through the digital devices. It seemed as though the children had focused on the format in which subjects were taught and practiced more than onto the essence of the subjects that they were supposed to learn. This resonates with the recent research conducted by Sonia Livingstone and Julian Sefton-Green with a class of 13 and 14-year-old children in suburban London (2016). The school of the researched children had imprinted their structure of levelling students' learning and comparing levels in a way that students – and their parents – "were directed to a standardized level of attainment…[where] levels [are] divorced from their original meaning in relation to

the subject matter…" (Livingstone and Sefton-Green, 2016, p. 133). Because of levelling learning in such a "ritualised and procedural" manner, the "content and meaning has become subordinated to the process of simply moving through" these levels (p. 132). Similarly, the children in this thesis discussed the restrictions the teachers placed on how the tablets could be used and the apps and software they had to learn to use more than the subject or topic that they dealt with while using these digital tools. The respondents' rather negative opinions with regards to how they were allowed to use digital tablets in class were evident across socio-economic backgrounds and gender. For example, the following conversation took place with the children from Workshop 6 to understand how they used their tablet devices in class before they began working on their projects for this thesis:

> Researcher: Do you use the tablets in class everyday?
>
> Jaeden: Not every lesson, like, for maths we use Workspace so we can write the answers. Like, she tells us a question, we write it on Workspace and it shows the teacher. And then we play a game according to which she tells us. But they're for maths. But there are sometimes like Kahoot sometimes but then she asks us the question.
>
> Kawyn: The teacher decides the questions and we have to tell the answers.
>
> Martina: …how to use it. She tells us what we're allowed to use it for. We can't do whatever we want [laughs].

Kawyn: Yes but then it could be like a game but again she tells us what we have to answer. We're not allowed to choose the games.

Jaeden: Kahoot is famous sometimes. And even during break, it was the famous, the most famous, because the teacher even plays Kahoot for us while we eat our lunch.

Researcher: And what kinds of questions would there be on Kahoot during lunch break?

Jaeden: Like, memory games, for example, when was I born, or how much…or how much…

Kawyn: Like, it asks you 2008, 2009, 2006, and you have to get one right. And then if you get it right there is a very good thing…

Martina: You get scores. And then, just you get really excited. You don't really win anything.

Jaeden: You get a picture of a medal and you have first place.

Researcher: Does the teacher allow you to make anything with your tablets?

Jaeden: Well not really. But I made one about me. A Kahoot game about me, but that's not allowed in school.

A similar conversation developed with the children from Workshop 3 before they started their creative project for this thesis:

Aiden: But she never lets us play like fun games on the Google…

Dawson: She doesn't let us.

Aiden: We're not allowed to play fun games, like fun games.

Dawson: Just asks us to make PowerPoints.

Annabel: And Excel, I hate this. It's so boring.

Dawson: And PowerPoints. They're boring because she says we can't…I would only like it if she lets us decide what to put. She always tells us what to put.

Annabel: She actually asks us to open a ready one and then just to edit it. She asks us to edit it. It's just so boring.

Aiden: Sometimes it is the boring bit that we always have to copy or work on her PowerPoints. And she shouts when we get it wrong.

In contrast to the above expressed opinions, the children's reflections on the experience they had with the tablets during this thesis's workshops veered around how they could improve on their imaginary characters and their plots; what could happen to their characters next; around the material they needed to develop their characters (which led the children to search the Internet); around stories or audio-visual clips which they could create next, and so on. Additionally, the children searched for information and material (such as images, sounds, text) over the Internet for their projects. This gave them further topics for discussion among each other. This experience also helped them build upon their general 'taste' and memory from these workshops. For example, the children from Workshop 3 searched for

information about Mars and other planets. Jaeden (Workshop 6) searched for information about Interpol and about the difference between policemen and 'secret agents' in connection with his crime story. The children from Workshop 1 searched for information about World War Two (WWII) since they imagined they were journalists in a time of war. In other words, the workshops seemed to become a steppingstone for the children to connect with the wider world and with various subjects in a fluid, connected to their current project manner. This process of creative production led the children to a form of learning and discovery and moving from one subject to another without the typical boundaries of school (separating knowledge into subjects and time slots), all of which was directed under their own initiative. This is a reminder of the constructionist view of learning as explained by Seymour Papert (1993), building on from Piaget's constructivism. That is, knowledge is connected – whether one studies maths, history, or flowers, the subjects are intertwined – and that learning depends on self-discovery and self-navigation (Papert, 1993). The workshop participants seemed to experience such flow without being told, without them even realising what they were learning/studying or *that* they were learning/studying. Again, this way of learning and even the focus of the learner contrasts to how children learn in school and what they focus on while learning in school. In school, children often focus on what is being repeated to them by parents and teachers that they are there 'to learn' and 'to study', somehow *what* to learn and *what* to study often being left as a less clear concept to the children.

The process of creative production during the workshops further formed the need in the participants to search for new knowledge and information – a need to understand that wider world outside of their immediate environment. From cognitive-

developmental perspective this also demonstrated how children had a purpose to search for new knowledge and for learning new things (about Mars and other planets or about WWII as were the cases with Workshops 3 and 1 respectively). The information about Mars or WWII became contextualised. It did not require a 45-minute lesson in astronomy or history. It took a creative project with a digital tablet to trigger children's interest in the subjects. This contextualised, focused, and self-navigated learning created a continuum from one subject to another. For instance, the children from Workshop 3 discussed whether their characters would be able to breathe on their imaginary planet. Dawson and Aiden did not want to settle with just a wild guess; they insisted on the imaginary story to have some logic and connection with reality. They discussed at length what allowed people to live on planet Earth, how oxygen was created, and how other planets – theirs specifically – could have oxygen so their characters could be realistic. In contrast, the experience these same participants seemed to gain from working with tablets during maths or religion lesson was only a way of practicing and revising the theme that has been covered on that one particular maths lesson on that one particular day during school in a rather disconnected way. In other words, the workshops placed the children at the centre of the learning while engaging themselves in a creative production. The children themselves become the constructors of their learning.

In contrast, during school lessons, the very lesson designated to a 45-minute slot on a particular day takes centre stage. The child becomes the guest who must obtain what is given to them without them even having asked for this information. This is not to discard schools' way of learning. However, the workshops demonstrated that when children engaged in creative production they seemed to find purpose in learning new

things. They found applicability, purpose, and need in acquiring new knowledge. Learning became purposeful to them. The children themselves took centre stage; they became the active participants in the process of learning.

CHAPTER 9

CONCLUSION

9.1. INTRODUCTION

The purpose of this thesis was to develop a model to foster creativity through the use of digital media devices that can eventually apply to the school setting, specifically to transform the current ICT lessons in the primary schools in Malta. This goal stemmed from four main considerations.

The first was based on the supposition that many children, aged seven to ten in Malta, used their digital devices for consumption of various media content – for interaction more than for creative production (Resnick, 2012, 2017). The conclusions from research phases 1 and 2 of this thesis support this supposition. The majority of the interviewed children, and their parents, said that the children used their digital devices to play video games and watch video content. While this does not reject the

possibility that such activities can foster creative thought, questions remain as to whether children engage in creative production through digital media. Many of the interviewed children also said that the most common activities they engaged with when on their digital devices was to take pictures, to draw and to make videos. On the other hand, as some literature highlights, getting familiar with certain activities may preclude children from moving onto the ladder of opportunities and learning new skills (Livingstone and Helsper, 2007). Combined with other obstacles such as children's overall lack of free time during school period, parental rules addressing screen time more than quality use, overall unclear conception of the meaning of creative production with digital media among some parents and teachers and a tendency to discount children's perspective of creative production with their digital devices in and outside of school, creative production remains minimal among the interviewed children.

The second consideration was that school is also an element that plays its part in the effort to encourage children to engage in creative production through digital media devices. Primary schools in Malta currently focus on educating digitally literate children by teaching them how to communicate and handle information, how to manipulate texts and use the core Microsoft packages, how to safely navigate through the World Wide Web and other similar activities, as outlined in the national syllabus (Directorate for learning and assessment programs, 2012) and as explained by the interviewed ICT teachers. Such activities do not necessarily foster creativity in children as they are often given ready-made examples that they are asked to copy or respond to games that support basic literacy and numeracy practices as many of the interviewed children explained in their own words.

The third consideration related to the link between creativity and learning (Vygotsky, 2004; Runco, 2004; Resnick, 2002; Loveless, 2006). As Seymour Papert has said, children do not *have* ideas; they *make* them (Papert, 1993). To create things also demands of the creator to search for material – information as well as cognition to process this information – all of which translates into learning. When children create, they explore, solve problems, experiment and so on. This way they also learn. As was evident throughout the workshops, the participants followed their own creative productions and as they did so they also explored new subjects – astronomy, media production, criminal law, history; they tried to solve problems – whether they looked for logic in a fictional murder case or whether a human being could live on a planet without oxygen. They experimented – some with audio-visual tools, others with writing and artistic designs. While children may not always navigate well throughout the creative process, the design of this thesis's workshops have highlighted the key role a facilitator, or 'expert other', can play. This has emphasized the weight and validity of the sociocultural theoretical perspective of learning as the second pillar on which this thesis has stood.

And the fourth consideration was that outside school children did not always have time, energy, opportunities and even direction for creative production or to explore subjects close to their heart. Their school environment – during ICT lessons specifically or in any other lesson where digital tablets may have been put to use – did not provide room for such opportunities either. Outside school many of the interviewed children seemed to have more opportunities to pursue their personal interests albeit with limitations, for example, due to screen time concerns. In their

own descriptions, some children, both from richer and equally from poorer backgrounds, engaged in creative production. Yet, their parents seemed to disqualify them as such. Overall, many of the interviewed children seemed to have more control over the use of their devices outside school. In contrast, the teachers strictly decided upon how and for what purpose the devices would be used in class – during ICT or any other lesson – without children having their say.

Where creative production was allowed in class, the children had to follow the teacher's instructions with no room for personal control. This way of "add [ing] thin layer of technology and gaming over antiquated curriculum and pedagogy [is], somewhat like putting lipstick on a pig" (Resnick, 2017, p. 23). Children love playing games and many educators may see the logic in bringing games into the classroom in the hope that they will be just as motivated and engaged in class as when they play games. However, as Mitchel Resnick has observed in today's classrooms, there is hardly any difference in pedagogy from decades ago (2017). Incorporating digital tablets by testing children's knowledge through game-like activities was observed during the first year of work for this thesis. And while some of the interviewed children found these game-like tests exciting, others did not. These observations demonstrate how the focus of educators seems to be cast on finding ways of using the tablets in class while the pedagogical methods remain intact – the teacher dictates how the lesson should go and how tablets would be used. In this arrangement children remain largely passive recipients of education and not critical and active participants.

Additionally, teachers and parents, it seemed, did not always recognise the way children liked to use their devices as means to creative production. Parents and teachers expressed the reductionist view that children used digital devices to "play games" or "watch YouTube" or "draw" where games, online videos and drawing vary immensely from one another as much as the outcomes, the learning involved, and the personal pursuits in engaging in such activities vary significantly from one child to another.

Finally, to both parents and teachers learning through digital devices often meant using them to practise basic literacy and numeracy. Furthermore, to teachers and parents creative production related more to arts and crafts or making virtual worlds. Coming to the fore, these perspectives have led to the conclusion that neither of the environments – in school or outside it – seemed to have provided much room for creative production with greater sense of control, engaging in an interdisciplinary manner, enabling pluralistic thinking, avoiding right/wrong activities, and providing opportunities for reflection (Resnick, 1998) for children aged seven to ten in Malta.

In view of the above four considerations, the research findings from the workshops have led to a positive conclusion with regards to the main enquiry, Q1, made through this thesis. Specifically: will a combination of the constructionist approach with an instructional framework (respective of sociocultural and critical pedagogical theories) enable creativity when children engage with digital devices? With greater sense of control over the learning process and being encouraged and facilitated through instruction and prompts, the children become creative and self-organised – all of which has been expressed through the accomplished projects of the workshop

participants and through the number of behavioural and attitudinal indicators (Ott and Pozzi, 2012) that have accounted for their creativity and for their creative way of self-expression (Gauntlett, 2007).

The behavioural and attitudinal indicators, identified, observed and recorded throughout each of the seven workshops helped in answering the second question of this thesis, Q2: What behavioural and attitudinal indicators and processes could be identified when children engage in creative production with digital devices within the framework of Q1? These were:

- Project initiation: Development of project details
- Desire to experiment with the digital media devices
- Gregariousness and positive emotions
- Q & As, brainstorming and discussions
- Critical evaluation and reflection
- Increased confidence and projections, i.e. imagining the unfinished project, excitement about audiences

The workshops collected evidence that helps to answer positively to Q1 and Q2. These can potentially support a positive answer for Q3 – whether an applicable framework can be designed for creative use of digital media devices with the aim to establish a culture of creators and makers and not only consumers of new media. Such workshops can be designed and applied in schools as part of the mainstream curriculum. They can allow children to take control over their own decisions for

creative production, research topics of their own interest, create their own ideas and learn as they do so.

This research has looked at the current environment in which seven- to ten-year-old children in Malta live, learn, and engage in creative production through digital devices. The objective was not only to find out about their breadth and depth of digital media use as parents and children saw it but also to unveil the reasons behind such practices in and outside of school and to find methods to foster creative production as a way to encourage learning. The research for this thesis demonstrated that many of the seven- to ten-year-old children who took part in the interviews lived and learned in an environment, which was dominated by a number of factors that played a role in how they approached digital media. The main factors included:

1) School and out-of-school engagements children had impacted on their time, energies, and motivations to pursue creative production through digital media devices;
2) The perceptions children had over their digital devices based on how their parents used these as an instrument to award or punish behaviour, which could potentially detract or altogether steer children away from seeing the devices as a tool to creative production;
3) Albeit not extensively researched for this thesis, the interviewed parents' own breadth and depth of use of digital devices seemed to reflect that of their children. That is, in their responses parents most often engaged with their digital devices for social networking and for watching programs but not for creative production. Similarly, children engaged more often in activities such

as watching videos on apps such as YouTube, played video games, listened to music or used apps such as for drawing and practising basic literacy and numeracy skills;

4) Parental control and rules were structured as a result of concerns with regards to screen time, less so with regards to the nature of engagement;
5) Many parents agreed to digital device use as long as it was 'educational'. However, 'educational' concerned mainly basic literacy and numeracy practices;
6) To parents, the concept of creativity and creative production with digital devices was relatively unclear. Some parents and educators regarded creativity as arts- and crafts-related skills.

Finally, this study has examined how through constructionist and sociocultural theories children take on making their own ideas, often critically viewing the elements that they add on to their creations and learning as they search for developing their ideas and while adding layers to their projects. The workshops designed for this thesis demonstrated that such essentially self-navigated creative production allows children to:

1) Engage in a collaborative and interdisciplinary environment, unlike the typical pedagogical methodology used in school;
2) See the wider potentials of digital devices and see them as tools that they can make things with;
3) Support them in their pursuit of personal interests and passions;
4) Make them active participants in the process of learning;

5) Retain their focus on the subject and content than on the format, rules, or levels of attainment;
6) Help them build confidence by being granted the responsibility to have a say in their own learning and education through the opportunities for creative production.

9.2. PLACE OF THIS RESEARCH WITHIN THE LITERATURE

Unlike other previous studies on computer use (Bergin, Ford and Hess, 1993; Benson and Lunt, 2011; Loveless, 2003; Loveless and Williamson, 2013; Resnick, 1998, 2002) this thesis has looked at how children engage with digital devices such as tablets in and outside of school. It has proposed means to foster creative production among seven- to ten-year-old children with at least two aims in mind. The first aim was to argue that educators or parents could impose limited use of digital media devices by directing children's use to basic literacy and numeracy practice. The second aim was to create an environment in which children can see digital media devices as an arsenal of tools with which they can make things, collaborate, and as they do so – learn in an interdisciplinary way.

This study further sheds light upon the concepts of creativity and how creative production is understood by parents and educators, and also upon social constructs such as 'free time' and 'educational activities'. It challenges these by bringing in the children's perspective and perceptions. This study also looked at parents in terms of

the examples they set to their children when it comes to digital media use. Parents' attitudes are transferred onto their children, as has been evident with regards to other subjects such as mathematics (Love and McVey, 2001) and education in general (Jeynes, 2011).

This study therefore has positioned itself among those that have chronicled children's everyday digital media use (Livingstone et al., 2011, 2014b; Mediappro, 2006; Ito, et al., 2009) and those that have centred around creativity and learning through the use of computer programs (Loveless, 2006; Resnick, 2002).

In a novel way, however, while raising the same aspect of reality that children often mirror their parents – actions and opinions often speak about not only who the children are but who their parents are, too (Coles, 1977) – this thesis has set forth the argument that parents' own understanding, drives, and skills in digital media use influence and resonate in their children. On the one hand, this challenges the view of children as 'digital natives', which can wrongly lead to the assumption that children are digitally savvy. This is not necessarily and certainly not always the case. Digital natives may have a 'natural' flair for getting on with a new device – their learning to operate with it perhaps differs from the way a person from a previous generation would learn to navigate through it. A child born after 2000s may not resort to using a manual as their parents might. This, however, does not necessarily lead the child to use the fuller potentials of these devices specifically with regards to creative production. In other words, 'digital natives' does not necessarily mean digitally literate, digitally skilled, or digitally enlightened. This underlines the necessity to clarify what 'digital natives' stands for. Its author (Prensky, 2001, 2012) penned it to

describe those who were born and grow up surrounded by digital technologies. Perhaps, he has attempted to convince his audiences that children begin to think, process information, and learn differently. This has created a kind of hype (Das, 2009; Palfrey and Gasser, 2008) that has affected many parents and some teachers to submit to the suggestion that 'digital natives' equates to some kind of expertise its members hold. This suggestion poses a danger in that it overshadows the details behind the label, and potentially leads parents to surrender to a dooming sense that a digital native will always precede them in knowledge and skills. Many parents and teachers, interviewed for this study, openly expressed this belief. Parents must remember that – 'immigrant' or 'native' – one still needs to acquire, maintain, and update skills, as well as learn how to use the new tools in a beneficial and fruitful way.

This study contributes to literature on creativity, too, by suggesting that children at the age of seven to ten experiment with their digital devices rather on the surface, as though they reside in an initial explorative stage of creativity. They do very much explore and try out apps, and also search for things that interest them. But they may often seem not to do anything 'substantial' creatively; nevertheless literature on creativity has often demonstrated that this initial phase is almost always present (Finke, Ward and Smith, 1992; Neumann, 2007; Runco, 1996; Russ, 2003; Vygotsky, 1967; Ward, 1994; Csikszentmihalyi, 1997). Instead of then discouraging such seemingly 'wasted' tinkering around, as parents or educators have sometimes judged it to be, this research suggests it should be accepted, facilitated, guided, and channelled towards a secondary, deeper phase – one of making things. And in relation to that, this work's contribution also lies in that the workshops designed and

conducted with two groups of children from two different schools demonstrated how, through a combination of constructive and instructive facilitation, children can enter that secondary, deeper phase of creation and meaningful making.

Finally, this study presented a novel approach to fieldwork through the use of design-based workshops. These aimed to see how children could approach digital media tablets, what they can make with them creatively, and how creative production could be encouraged. The workshops demonstrated how, through facilitation, rather than 'direct order' or planned instruction children can take on an idea, explore, and develop it into a specific product or project in an interdisciplinary way. Moreover, this method led the participants to tapping into learning about a number of novel subjects. The necessary 'ingredients' for them to become creative included time for reflection and conversation, enquiry-based communication, and equally time for active, hands-on, exploration, and experimentation among other things.

In connection to this, while this study supports the constructivist/constructionist view of learning in that it demonstrates how children can learn through direct experimentation, it also challenges the suggestion that solely doing and having an experience will lead children to applying their knowledge constructively. On the contrary, children do not always organise themselves and 'push' themselves through to the end of a project. As was evident throughout the workshops, self-directed construction alone did not always lead to anything 'whole' and completed. This confirmed the importance of the role of facilitator or the expert in guiding and encouraging children. Children showed willingness to try things out. They drew

from past knowledge, from their immediate environment, and from personal interests. They demonstrated their capacity to build novel ideas. Nevertheless, they needed direction, instruction, often external motivation and control to ensure that what they started would be finished, that what they experienced and experimented with they would not do so 'mechanically' or absent-mindedly. Rather, they would remain present to it, put meaning to it, and reflect on their work as a result. In a way, children needed assistance at times throughout each of these 'steps' – exploration, brainstorming, implementation, review and re-evaluation – but rather than design a theoretical 'mould' and follow strict parameters on how a child should be led to creative production, a facilitator has to assist a child in a natural, 'customised', individual manner; look for cues when the child might need redirection, reminder, or facilitation; know when to pull away and leave the child to his or her own agency, energies, and skills.

Customised and individual attention then can also be facilitated through the digital devices as they provide a wide range of support that the learner previously solely relied on the teacher to deliver. This is not to say that the digital device will replace the facilitator or the teacher. It could enable self-organised learning.

9.3. LIMITATIONS AND OPPORTUNITIES FOR FURTHER RESEARCH

While this research has attempted to obtain rich data by using a number of instruments, it nevertheless carries with it certain drawbacks. To begin with, the quantitative research instrument was conducted on a relatively small group of children, in comparison to other studies that have examined breadth and depth of digital media use among thousands of children (Livingstone and Haddon, 2009; Livingstone et al., 2011; Mediappro, 2006). On the other hand, considering the size of the Maltese population – roughly 400,000 – the figures obtained still bear evidence of patterns of breadth and depth in use among the aforementioned age group in the country.

Some workshops experienced challenges since the children had to be taken out of lessons and for that there was a limited time afforded for each workshop session. In two workshops the children had selected to work with a video application, whose final projects – featuring the participants – were not allowed to be taken out of the school premises. This drew the limitation to replay and re-examine the children's work, which meant that the researcher had to work with notes – audio and written – recorded during the workshops. With regards to these two workshops, the prohibition to display the visual work further limited the opportunity to exhibit the children's work as evidence of the successful implementation of their projects, the objective of the workshops. Only seven workshops were carried out as part of phase 3 of this research. More of these are necessary to examine in greater detail whether children in larger groups, say a whole classroom, would engage in creative production with similar passion as the participants in this research did.

This thesis has shed light over several gaps that must be addressed in the near future both by policy makers and educators and by academics and researchers. To begin with, as young as seven, children use digital devices and access the Internet daily. Nevertheless, their use often relies on trial and error. It often lacks external guidance and educational support. Their use remains mainly experimental, explorative, often rounds up to a few repetitive activities. While random experimentation with apps does not necessarily mean something negative, the lack of digital media literacy in schools for seven to ten-year-old children can limit the breadth and depth of use. This can further preclude them from creative production and an interdisciplinary, self-directed learning as a result. This is to say that while leaving children to explore and examine apps, content, games, and possibilities with and on their devices, the lack of guidance, facilitation, and fostering creative production can also mean lack of advancement and fewer opportunities.

Children learn by experimenting with their devices. For example, they do not learn to construct on Minecraft by reading manuals. Yet, when it comes to acquiring new skills, to making more complex things, they often resort to watching others playing at more advanced stages. They look for online tutorials. They ask for assistance, for instruction. Similarly, primary schools must provide instruction and tutorials in digital media literacy and skills hand in hand with individual freedom to experiment and explore subjects of personal interest. For that, further research can focus on the key skills children aged seven to ten can demonstrate now and design research workshops in which new skills and activities can be demonstrated and practised.

Finally, this thesis has also identified issues concerning parents with regards to their understanding of 'educational' engagement with digital media devices. Parents have often stated that they allowed their children to use tablets for 'educational' purposes. However, when prompted to explain what they meant by 'educational', they often referred to games about letter recognition and writing or games related to maths. Watching DIY videos, running a classroom blog about children's personal interests, to making comic strip books, digital journals about family trips and so on can also count as educational. Most often, however, such activities were not necessarily noticed or acknowledged as 'creative' according to parents. This creates the need, and, equally, the opportunity, to delve further into formal and informal learning and inform parents with regards to what their children can learn from the various activities afforded by digital media; to source 'educational' content that fits children's interests and supports their learning; to qualify currently accessed content and activities in terms of what 'educational' facilities and skills these may offer children; to supply parents with a broader range of use of digital devices as means to channel such ideas to their children; to inform parents about the educational advantages many activities favoured by their children may already have; to lead parents to sources where such information is already available; alternatively, to build such resources at parents' disposal and maintain an open communication with parents, specifically in Malta, in order for 'education' to begin with them – from the child's home. Ultimately, this research leads to the suggestion that parents must equally maintain their learning and education, alongside their children, on the larger properties of digital media devices. Parents, too, have to find the passion for creative production and to explore the fuller potentials of the tools in their hands. Parents'

personal enthusiasm, or lack thereof, to creative production through digital devices is likely to resonate in their children's enthusiasm and attitudes for such use.

APPENDICES

APPENDIX A – APPLICATION FORMS TO CONDUCT RESEARCH IN MALTESE SCHOOLS

The below are copies of application forms that were sent to church, private, and government schools. Each application form was provided in both English and Maltese. Only the English version is supplied in this thesis.

Curia, the Malta Diocese, was contacted to apply for research in the church schools in Malta. Permission for research was successfully granted. Individual contact was then made with a number of church schools. The application document submitted to Curia has been provided below.

The private schools were individually contacted. Permission for conducting research in their schools was obtained, where successfully, from the owner/director of each of the private schools.

Authorisation for conducting research in government schools was obtained from the Directorate for Quality and Standards under the Ministry of Education of Malta. After approval, individual government schools were contacted to ask for permission to conduct research with students. A full copy of the application form to conduct research in government schools in Malta is available in PDF form online:

https://education.gov.mt/en/resources/Documents/Application%20Forms/Student%20Application%20Form%20for%20ResearchInSchools.pdf

REQUEST FOR CONDUCTING RESEARCH IN CHURCH SCHOOLS

Name: Velislava Hillman
ID: 213414(L)
Tel: 99251174
Address: 26 Triq il-Gabillott, Swieqi, SWQ 3161
Email: vhillman@set.com.mt

Title of Research: FOSTERING CREATIVITY THROUGH THE USE OF DIGITAL MEDIA DEVICES
Aims of research: FOR COMPLETION OF PHD DEGREE WITH UNIVERSITY OF WESTMINSTER
Time frame of research: preliminary onsite observation – to see how children use tablets; then up to 1 hour focus group interviews, 10 personal interviews, and possible participation in 'creativity' workshop for volunteer students

Description of Methodology
The methodology of this research consists of stratified sample selection of students from those schools that are currently enrolled in the pilot project of the Maltese government's tablet-per-child scheme: St Albert the Great, St Joseph Mater Boni Consiglii and De La Salle College Selection will be made with equal representation of gender and age from each school.

Age group
7-10/11

Questions
During the focus group questions will be semi-structured – list of exact questions surround: 1) current digital media use and practices in and outside of school from children's perspective; 2) creativity-related questions and what children do and make with their digital devices in and outside of school; 3) typical days spent in and outside of school from children's point of view – during school and during holidays; information about extra curricular activities, favourite subjects, hobbies and past-time activities.

Language
The interviews and focus groups will be conducted in either English or Maltese, at the participants' choice.

Date: 21/04/2015
Researcher/PhD applicant and ID: Velislava Hillman 213414(L)

REQUEST FOR CONDUCTING RESEARCH IN GOVERNMENT AND PRIVATE SCHOOLS

DIRETTORAT GHAL
KWALITA` U STANDARDS FL-EDUKAZZJONI
FURJANA VLT 2000
MALTA

DIRECTORATE FOR
QUALITY AND STANDARDS IN EDUCATION
FLORIANA VLT 2000
MALTA

Request for Research in State Schools

A. (Please use BLOCK LETTERS)

Surname: Hillman Name: Velislava

I.D. Card Number: 213414(A)L)

Telephone No: 21 380 933 Mobile No: 99251174

Address: 26 Triq il-Gabillotta

Locality: Swieqi Post Code: SWQ 3161

E-mail Address: vhillman@set-com.mt

Faculty: Media, Arts & Design Course: _____ Year Ending: 2018

Title of Research: fostering creativity through the use of new media technologies in the sphere of education

Aims of research: ☐ Long Essay ☐ Dissertation ☑ Thesis ☐ Publication

Time Frame: 18 months Language Used: English / Maltese

Description of methodology: field observations, focus group(s), interviews

School/s where research is to be carried out: gov. independent and church schools Siggiewi, Msida, Gzira, Cospicua, Mellieha

Years / Forms: year 4 (8, 9, 10 year-olds) Age range of students: 8, 9, 10

I accept to abide by the rules and regulations re Research in State Schools and to comply with the Data Protection Act 2001.
Warning to applicants - Any false statement, misrepresentation of concealment of material fact on this form or any document presented in support of this application may be grounds for criminal prosecution.

Signature of applicant: _____ Date: 10/4/2015

APPENDIX B – CONSENT FORMS

PARENTS'/GUARDIANS' CONSENT FORM

(To be filled when data subjects are minors)

The Directorate for Quality and Standards in Education has authorised research on the experience of children with digital devices carried out by PhD student that your child can participate in. To comply with the Data Protection Act 2011, your permission is necessary prior to your child taking part in this research. Please, tick the appropriate boxes below, sign and date the form where indicated.

Kindly return the completed form to the Head of School or her/his representative.

Consent to be given by parent/guardian:

I give permission (by ticking on each box) for my child to participate in:

□ To discuss, in a group with other children, or in the form of a personal interview, your child's favourite things he/she does on a digital device such as a mobile phone or a digital tablet

□ To participate in a creative activity in which your child will be allowed to create a project using digital tablets

No video recording of your child will be made.
The anonymity of all children taking part in this research will be kept.
The research data will only be used for academic purposes.

Declaration by parent/guardian:

I understand that details such as residential area, age, gender and social background of my child will only be included in the above mentioned research only for the purpose of analysing the data collected following my prior consent.

_____

Signature of parent/guardian

_____

Date

PARENTS'/GUARDIANS' CONSENT FORM (WORKSHOP PARTICIPATION)

(To be filled when data subjects are minors)

The Directorate for Quality and Standards in Education has authorised research on the experience of children with digital devices carried out by PhD student that your child can participate in. To comply with the Data Protection Act 2011, your permission is necessary prior to your child taking part in a 'creativity' workshop that has been designed as part of this research. Please, tick the appropriate box below, sign and date the form where indicated.

Kindly return the completed form to the Head of School or her/his representative.

Consent to be given by parent/guardian:

I give permission for my child to participate in:

□ a creativity workshop in school, which will last 3 hours, spread over 3 non-consecutive days

No video recording of your child will be made.
The anonymity of all children taking part in this research will be kept.
The research data will only be used for academic purposes.

Declaration by parent/guardian:

I understand that details such as residential area, age, gender and social background of my child will only be included in the above mentioned research only for the purpose of analysing the data collected following my prior consent.

_____

Signature of parent/guardian

_____

Date

APPENDIX C – QUESTIONNAIRE FOR PARENTS

Creative explorations of 7 to 11-year-olds' use of digital devices

Thank you for taking part in this survey. As part of my PhD research, this survey aims to gather information about what, where, when and how much children engage with digital devices according to you. The final work will help in drafting best practices for use of digital devices in and out of school for children aged 7 to 11 in Malta.

BEGIN SURVEY

1. What is your age?

18 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65 +
○	○	○	○	○	○

2. What is your gender?

Female	Male
○	○

3. Please, check the age and gender of your child or children from the options below:

	7 years old	8 years old	9 years old	10 years old	11 years old
Boy	○	○	○	○	○
Girl	○	○	○	○	○

4. Please, choose one of your children – aged between 7 and 11 – and complete the survey for that one child only. In the space below, write the child's age and gender for whom you will be filling up this survey:

   _____

5. Please, write the name of the town where you and your child live: _____

6. Name of school of your child: _____

7. Literacy proficiency of your child (check for each "reading" and "writing"):

	Struggling: my child performs below the majority of his/her classmates.	**Average:** my child needs help every now and again.	**Good:** my child performs in line with the majority of his/her classmates.	**Very good:** my child is often better at it compared to the majority of his/her classmates	**Outstanding:** performs well beyond everyone his/her age.
Reading	○	○	○	○	○
Writing	○	○	○	○	○

8. Which of the following best describes your current job level? (Check one box or write in "other")

Owner/Executive	Senior manager	Middle management	Intermediate	Entry level	Other (please specify)

9. Which of these devices does your child personally own? Check all that apply.

	Yes	No
Digital tablet (e.g. iPad, Samsung Galaxy, etc.)		
Smartphone (e.g. iPhone, Samsung, HTC, etc.)		
Video game (e.g. computer, Xbox, Nintendo Wii, etc.)		
E-Reader, (e.g. Kindle, Sony reader, Kobo, etc.)		
Tablet for children (LeapPad2, Vtech Innotab or Kurio 7)		
TV in his/her bedroom		
DVD player in his/her bedroom		
Video games for a computer		
Other. Please, specify		

10. Which of these devices has your child used (at home or elsewhere) in the past 6 months? Check all that apply.

Shared or personal tablet (such as iPad, Samsung or other)	
Shared or personal laptop that my child can take to the bedroom	
A (stationary) PC shared by others	
A (stationary) PC in her/his own bedroom	
Shared or personal smartphone (such as iPhone or Samsung etc.)	
A games console (such as computer game, PlayStation, etc.)	
Another digital device that connects to the Internet	

11. How long does your child spend with a smartphone or a tablet?

On a **SCHOOL** day	Around 30 minutes	30 to 45 minutes	45 minutes to 1 hour	1 hour to 1:30	1:30 to 2 hours	More than 2 hours
On a **NON-SCHOOL** day						

12. Which kind of App has your child used the most in the past 6 months? Check all that apply.

	On a smartphone	On a tablet	I don't know
Basic learning and literacy			
Social networking (e.g. WhatsApp, Facebook, Instagram, etc.)			
Style creation (e.g. Stardoll, Fashion Icon, etc.)			
Escape and Obstacles (e.g. Temple Run etc.)			
Sports (e.g. FIFA, Kick Rugby, Wrestling, etc.)			
Basic Strategy (e.g. Angry Birds)			
Creating virtual worlds (e.g. Minecraft)			
Nurture and mimics (e.g. My Horse, Talking Tom, Toca Doctor)			
Listening to music			
Drawing/colouring (e.g. My Colouring Book, Draw Faces iMake HD)			
Making collages			
Taking photos			
Watching videos			
Watching video apps (e.g. YouTube)			
Role play (e.g. Princess Dress-up, Pet Shop)			
Creative production (e.g. First Camera, Video Star)			
Story apps/interactive books (e.g. Nighty Night, Cinderella)			
Augmented Reality (e.g. Mattel Apptivity apps, ColAR Mix, AR Flashcards)			
Networking (e.g. Facebook, Instagram, Whatsapp etc.)			
Looking at photos/pictures			
Video/voice communications (e.g. FaceTime, Skype etc.)			
Browsing the Web			
Using search engines (e.g. typing words into Google and searching)			
Watching videos made by other children on YouTube (e.g. 'unboxing' videos)			
Watching 'catch-up' TV			
Watching other children play games (e.g. live on YouTube)			

Other (please specify)	

13. How often the following situations are true:

	Always	Often	On occasions	Rarely	Never
The tablet/smartphone provides a sit-back experience (e.g. watching a video).					
The tablet/smartphone is used to encourage my child to be creative and/or play.					
The tablet/smartphone is used as a social device (e.g. co-usage with adults or other children).					
The tablet/smartphone is used for educational purposes (e.g. learning the alphabet).					
The tablet/smartphone is used as a form of distraction or quiet time.					

14. How often does your child watch more than one screen at the same time, e.g. using a tablet/smartphone while watching TV?

All the time ○ Often ○ On occasions ○ Rarely ○ Never ○

15. Of all the different types of Apps your child uses, which ones do you like the most and which ones do you think your child likes the most? **Check only yours and your child's favourite.**

	Parent favourite	**Child favourite**
Basic literacy skills		
Social networking		
Escape and Obstacles (e.g. Temple Run)		
Sports (e.g. FIFA, Kick Rugby, Wrestling)		
Basic Strategy (e.g. Angry Birds)		
Creating virtual worlds (e.g. Minecraft)		
Nurture and mimics (e.g. My Horse, Talking Tom, Toca Doctor)		
Audio play		
Drawing/colouring (e.g. Drawing Faces iMake HD)		
Video apps (e.g. YouTube)		
Role play (e.g. Princess Dress-up, Pet Shop)		
Creative production (e.g. First Camera, Video Star)		
Story apps/interactive books (e.g. Nighty Night, Cinderella)		
Augmented Reality (e.g. Mattel Apptivity apps, ColAR Mix, AR Flashcards)		
Other. Please, write name or describe what the App does.		

16. What are your child's **5 favourite Apps** at this moment? If you can't remember the name, write instead what the Apps are about (e.g. strategy game; drawing; reading; sports game...)

_____

17. What are the most important features you look for in an App according to which you make your decision to buy/download it? Check all that apply.

	Very important	Somewhat important	Not at all important
Educational			
Fun			
Easy to use			
Instructions for parents included			
Attractive to look at			
Play			
Music/songs			
Good customer reviews			
Something else (please, specify)			

18. What are your motivations for downloading an App for your child? (Check all that apply)

A gift/present	
To support my child's learning	
To satisfy my child's interest/passion	
Another way to interact with a character from TV, film, book	
Good reviews from other users	
Prefer my child to use Apps rather than the Internet	
My child has completed all the other Apps my child has used	

Other (please, specify) _____

19. When it comes to using a device what things does your child need help with? (Check all that apply)

Turn the device on and off	
Unlock the device	
Open apps	
Use reading apps	
Take photos	
Make videos	
Make drawings	
Drag items across the screen	
Trace shapes with their fingers	
Exit and enter apps	
Fix volume	
Tap the screen to operate commands	
Swipe the screen (e.g. turn the page of an e-book; change photos)	
Enlarge or decrease the size of objects by pinching and dragging	
Show others (e.g. siblings, friends, or relatives) how to use the device	

Something else (please, specify)_____

20. How comfortable or uncomfortable are you with your child using a digital device (tablet or mobile phone)?

	Very comfortable	Somewhat comfortable	Neither nor	Somehow uncomfortable	Very uncomfortable
The amount of time my child spends on (any) digital device.					
My child using (any) digital device unobserved by me or another adult.					
That they know when to ask for parental/other help.					
The sorts of things my child does on (any) digital device.					
That they know where their favourite Apps are.					
That they know how to avoid other content.					
That (any) digital device can be used for positive things e.g. learning or creativity.					

Other (please, specify)_____

Any additional comments when it comes to what you think about your child using digital devices that have access to the Internet and various software applications, please write your answer or suggestions and comments below:

_____

END OF SURVEY

Thank you so much for answering these questions.

APPENDIX D – SOME OF THE APPS SHOWN TO AND DISCUSSED WITH CHILDREN AND PARENTS

Source:	Name of app	Visual
www.commonsensemedia.com	Drawing Pad	
	Draw Something 2	
	Art Set	
	Doodle Buddy	
	Faces iMake	
	Brushes 3	
	Foldify	
	Sago Mini Doodlecast	
	Pixel Press Floors	
www.iGeeksBlog.com Monster Colouring book	Glow Doodle	
	Drawing desk	
	Tayasui Sketches	
	Monster colouring book	
	Pixie Dust	
	Telestory	
	Toca Taylor	
	Foldify	
	Minecraft	
	Comic Strip	
	Hair Salon Me	
	Princess Dress-up	
	iMovie	
	iMovie	
	Book Creator	

APPENDIX E – MONITORING SHEET

Behaviour Record Sheet

Date/time (Day 1, 2, 3)	Activity	Behaviour(s)			Observable emotions, gestures etc.	Language used in expressing opinion; frequently used words	Free-style notes
		Child name	Child name	Child name			
	Presentation of slides						
	Discussions on creativity						
	Discussion on favourite activities with tablets						
	Discussion on ICT and tablets in class						
	Work on project: development of details						
	Distribution of work (individual or in group)						
	Conceptual issues; solving problems						
	Attitude – gregariousness, etc. during process of work						
	Issues related to tablet						
	Research, content, design issues and process of work						
	Relations/communication/collaboration issues among participants						
	Behavioural indicators during Q&A among each other						
	Behavioural indicators during experimentation with tablet/apps						

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