The Digital Literacy and Multimodal Practices of Young Children: Engaging with Emergent Research

Proceedings of the first Training School of COST Action IS1410, University of Minho, Braga, Portugal, 6th - 8th June, 2016

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NOTA EDITORIAL/EDITORIAL NOTE
Este ebook resulta da 1.ª *Training School* da Ação COST IS1410 - *The Digital Literacy and Multimodal*

Practices of Young Children (DigiLitEY), realizada no Instituto da Educação da Universidade do Minho, em

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This ebook came out of the 1st Training School (TS) of the COST Action IS1410 - *The Digital Literacy and*

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Introduction

Digital Literacy and Multimodal Practices of Young Children: Engaging with emergent research

Íris Pereira and Altina Ramos

This ebook came out of a Training School (TS) that was held as part of COST Action IS1410 - The Digital Literacy and Multimodal Practices of Young Children (DigiLitEY).

DigiLitEY is a multidisciplinary European research network aiming to examine how 0-8 year-old children's literacy experience and learning are being shaped by changes brought about by the digitisation of communication. It pursues a many-fold research agenda, which, for the purposes of this introduction, can be summarised as follows (cf. Sefton-Green, Marsh, Erstad & Flewitt, 2016):

1. To acknowledge and develop relevant theories in understanding change and continuity in children's digital literacies;

2. To systematise (and envisage) research on:

   a. digital literacy practices of young children in homes and communities;
   b. the definition and assessment of literacy and/or literacies in early-years settings, primary schools and informal learning settings as well as the characterisation of the pedagogy of digital literacy;

   c. digital meaning making;

   d. the increasing integration of the online and offline domains for young children's digital literacy practices and worlds .

3. To create a knowledge base on research methodologies and ethical issues.

By targeting these aims and producing scientific research, DigiLitEY intends to contribute to the enhancement of the very social circumstances that first stirred its emergence. Particularly relevant are the intentions to influence the enactment of safe and effective playful and creative digital meaning making among young children either in formal or informal settings; prompt government policies that impact on the development of school socially responsive and all-inclusive curricula; and to inform and inspire theories that look into childhood from sociological and cultural perspectives.

When we proposed to host the 1st DigiLitEY TS at the Institute of Education of University of Minho, in Portugal, we were aware of the complexity of what was at stake. We knew that training schools intend to be spaces in which PhD students and Early Career Investigators are

acquainted with established experts in the field, and also provide space for networking and sharing and discussion of ongoing research which is, or has been, carried out by young researchers. Besides, we also realised that the 1st TS had already been projected as a specific contribution to the systematisation (and envisaging) of research on digital literacy and multimodal practices of young children (aim 2, above).

The 1st DigiLitEY TS took place from 6th - 8th June, 2016. We welcomed 21 selected trainees from 12 different COST countries: Paulina Barańska (Poland), Marco Bento, Rita Brito (Portugal), Angela Colvert (United Kingdom), Helene Dahlström (Sweden), Patrícia Dias (Portugal), Nieves Galera (Spain), Habib Güneşli (Germany), Helle Hovgaard Jørgensen (Denmark), Skúlína Hlíf Kjartansdóttir (Iceland), Maria Ana Medeiros (Portugal), Inge Merkelbach (The Netherlands), Pekka Mertala (Finland), Thilde Emilie Møller (Denmark), Ana Francisca Monteiro (Portugal), Sari Räisänen (Finland), Saara Salomaa (Finkand), Burcu Sari (Turkey), Fiona Louise Scott (United Kingdom), Cristina Sylla (Portugal) & Phil Wilkinson (United Kingdom). Some trainees were PhD students, while others had already completed their PhDs and were Early Career Investigators. We invited four keynotes, two from the UK, Jackie Marsh and Gunther Kress, and two from Portugal, António Moreira and Nelson Zagalo, who shared their theoretical insights on digital literacy practices in families, multimodal communication and meaning making, transformed pedagogies and videogames.

Finally, we also welcomed several Portuguese trainers, some closely related to DigiLitEY (Lúcia Amante, Isabel Alexandre, Maria Manuel Borges, Ádila Faria, António Osório, Cristina Ponte), others less so but still having knowledge and experiences worthwhile sharing (Pedro Branco, Carlos Moreira, José Moura de Carvalho and Fernando Franco).

This ebook presents trainees' research papers as well as essays authored by keynotes and trainers. It was thought of as the final part of the TS, indeed a necessary one, so that current trends in emergent research on the digital literacy and multimodal practices of young children are widely shared and the whole DigiLitEY network is able to engage with them. As such we believe that this ebook is of potential interest for new as well as senior researchers.

Part 1 includes all the 21 papers presented during the TS. Our brief analysis of the abstracts supported by NVivo clearly shows the overall strong relevance of the research presented during the TS as well as the richness that each paper brought to the DigiLitEY's agenda. Words represented in larger font in Figure 1, below, point into central themes traversing the on-going investigations presented, whereas smaller ones, featuring as less recurrent among the whole set of words in the abstracts (and, therefore, more atomised among papers), identify the fine points of research which each of the researchers are digging into (or have recently done so).

Some interesting conclusions can be

Figure 1: Word frequency in the abstracts (trainees´ papers)

reached when looking into the papers with reference to the four issues assumed as central in DigiLitEY's research. One of the most evident is that in many cases research crosses at least two of the four central research domains, namely families, pedagogy/education, digital meaning making and online-offline integration.

Another conclusion concerns the non-balanced weight among research objects and interests. A slight majority of papers addresses educational-pedagogical matters, either in pre-school or primary school settings (though none explicitly and directly involving informal learning spaces such as museums or libraries). Some look into digital educational resources, focusing either on their use to promote formal literacy (and cross curricular) learning (Kjartansdóttir) or formal literacy learning by children with special needs (Merkelbach et al.) as well as on participatory design and development (or envisaging) of such learning resources (Colvert, Medeiros, Mertala, Sylla); others investigate teachers' professional development in the context of new literacy practices (Bento et al., Räisänen, Saloma). A common concern among these investigations is the need to update pedagogies by fostering the integrating of the learning affordances of

digital resources. In Colvert's and Salomaa's cases, there is a clear intention in contributing to the development of relevant theoretical models.

Family digital literacy practices are the object of study of a considerable number of investigations. Some intend to depict the role of digital media in children's lives (Barańska), with a look into children's digital devices and competences (Brito & Dias). Other research focuses on children's online activities, highlighting children's perceptions about opportunities and risks (Brito, Monteiro et al.). Some research further expands these concerns by developing sociological approaches to the study of family digital practices. In such cases researchers want to understand how digital literacy practices have impacted on routines and forms of socialisation of families with young children (Galera), how the living and educational media environment of children from diverse cultural and linguistic backgrounds are shaped by digital experiences (Güneşli), and the effects of social class upon children's home practices with TV and related media (Scott). In one case, there is research on an intervention into the promotion of digital capabilities among disadvantaged families (Wilkinson). In these later cases, there is a concern with surfacing social inequities concerning children's digital experience at home as well as the necessity and possibility to overcome such inequalities in children's (and families') own interests.

The integration of online and offline domains for young children's digital literacy practices and worlds is at issue in several papers. There is research on how play is being impacted by children's digital experiences, either at pre-school (Dahlström) or at home (Scott), how formal learning practices are being reconceptualised and transformed by the integration of digital features (Colvert, Medeiros, Mertala), and the role of online spaces in the construction of children's identities and cultures (Monteiro et al.).

The impact of multimodality upon young children's meaning making process is the clear focus of three papers, revealing research on children's writing of narrative texts (Dahlström), collaborative film making (Møller) and the learning of vocabulary (Sari et al.).

In Part two, the ebook offers four essays authored by Keynotes and trainers. Amante and Ponte address issues related to family literacy practices. Amante centres her attention on parental mediation, pinpointing different forms of mediation and highlighting the role that further research on emergent media habits may play in fostering parents' roles as an educational opportunity for children. Ponte, on the other hand, points out how the so-called "weird" families label prevails in research "to catalogue the disadvantages faced by particular social groups at the expense of considering their strengths" (Ponte, this volume) and invites research to embrace a more holistic approach, more aware of the social diversity of the families and how contents and contexts interact.

Moreira addresses pedagogical issues in his essay. He offers a reflective overview of the pros and cons of (mis)using digital toys in early stages of learning, arguing about the role of non-intrusive digital toys and playing in forging engaging opportunities that set the foundations for the development of digital literacies. He also identifies a set of principles sustaining pedagogical uses of ICT's in children's learning contexts from an early age.

Pereira focuses on reading on screens. She identifies multimodality, interconnectivity and interaction as three central features of digital texts and discusses the possibilities and requirements they pose on digital meaning making, which she highlights by comparing to reading 'on paper'. She also identifies relevant research questions about young children's digital reading.

The professional significance of organising this TS will be enduring for both of us. The most outstanding revelation was the surfacing of the complexity that is intrinsic to DigiLitEY's research object. There is great diversity of circumstances in which children experience, learn and develop digital literacy and multimodal communication in COST countries that have joined in this Action. Countries are far from being alike in what concerns to the political, pedagogical, cultural, linguistic, social or in economic terms that frame the digital literacy practices of young citizens. The TS has also put in evidence a great

diversity in the epistemological frameworks that are used to make meaning out of empirical data, ranging from sociocultural understandings of early literacy learning, theories of multimodality and work in the field of media literacy but also notably including New Literacy Studies, cognitivist theories of digital meaning making, play theories as well as sociological theories and cultural theories on childhood and child cultures.

Organising this TS was a big challenge for both of us and it received a globally positive assessment. The help we got from COST, CIEd (Research Centre on Education) and IE (Institute of Education of University of Minho) was essential in making it possible. We would, however, like to underline that without Jackie Marsh's active and enduring support it would not have happened. She well deserves our biggest Thank you!

Íris Susana Pires Pereira & Altina Ramos

Braga, Portugal, October 2016

Reference

Sefton-Green, J., Marsh, J., Erstad, O. & Flewitt, R. (2016). Establishing a Research Agenda for the Digital Literacy Practices of Yong Children: a White Paper for COST Action IS1410 [accessed: http://digiliey.eu].

Paper 1

The acquisition of media competences in Poland by preschool children at home

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Abstract

The work includes theoretical and empirical considerations regarding media competences amongst children aged 3–5 years old. These competences affect the role the media are beginning to play in the life of a small child. They enter unnoticed into their world and domesticate it very quickly, luring with its attractiveness, volatility and quickness. The main aim of this work is an attempt to answer the question: What is the role of the media in the life of the modern child? Both methodological preparation as well as a survey conducted among parents of preschool children allowed interpretation of the results, which show that children from an early age are surrounded by the media, which are mainly used by children for entertainment and education. The whole process is supervised by parents who are aware that media can positively affect the development of the intellectual, emotional and social spheres of their children, but only if they are used rationally. The media literacy of preschool children is conditioned by the nursery's and parents' combined work and can certainly protect children in the future against threats, which number as large as the number of opportunities.

Key words: New media, child of preschool age, media competences, family

Introduction

For many people, the Internet and new media are things without which we cannot imagine functioning. They are used both to study and work but also for fun; and what is more, their role is increasing. In academic settings, it begins to take on scientific importance to describe the so-called digital generation, by which is meant children and young people who are being constantly connected to a network from the earliest years of their lives. Digital generation is to be the future of the electronic cobweb. Working in a nursery and an interest in media space in a child's life led me to

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conduct research on the use of new media technologies for preschool children at home.

Modern childhood

The childhoods of today's children are shaped by the influence of changes related to system transformations and globalization. They grow up in a global civilization, they witness ongoing changes, suffer from the effects of domestic changes and experience various events (Małyska, 2011). Changes refer to the scope, nature and size of child's relationships, feelings and experiences. There are new stimuli building the childhoods of contemporary children, among them a dominant influence belongs to the media. Daily space in their lives is filled with all sorts of electronic media, such as TV, CD, computer, laptop, tablet, Internet, mobile phone and iPhone. Using media begins very early, almost from the beginning of life, and it takes the form of regular, daily contact which increases over time (Izdebska, 2009). The start of culture begins with contact with television and other electronic media. They are immersed very intensively in a child's life, subordinating its organization and filling it with their media content. And the child delves into the virtual world with great interest, it is a world with intrinsic properties (Róziewicz, 2011).

The reality presented in the form of syntheses, copies and models becomes for a given child a very attractive, but possessive factor, forcing him or her to adopt promoted patterns of behavior, opinions, views, different lifestyles. The virtual world is very often unreal, faked, and frequently competitive to the real world. It is full of success, prosperity, uniqueness, new opportunities and possibilities, but also wars, discrimination, cruelty, poverty and lack of tolerance. That's the world that entered very strongly into the child's life through constant, permanent contact with him on the TV, computer and phone (Izdebka, 2009a).

Children and new media

Imagining a preschooler, we see him or her on a bike, with building blocks, dolls or cars. Rarely would we mention the use of a computer as a form of leisure activity for children of this age. However, more and more often there appear such terms as digital-native children, children of the network, preschoolers in the network.

Constant, daily contact with media causes their childhood to be referred to as a television, media, computer or network period (Izdebska, 2009). New digital technologies are perceived on the one hand as a powerful support for the child's cognitive and emotional development, but accused of causing anxiety, danger and fear.

An analysis of contemporary literature shows that children treat media as an integral and perfectly natural part of their life. Not without reason, in the market keep appearing DVDs for babies, computer games for slightly older children, television

programmes aimed at children under six months of age. In addition, more and more often appear sites and portals where the target customers are small children. Many parents appreciate such actions, indicating their educational value. They argue that, thanks to computers, children learn letters, learn to read. From TV flow English sounds that promote language learning and education to teach social behaviour.

The correct use of new technology by the child determines to a very large extent what he or she learns from the media, what the benefits are, whom he or she becomes as a result of these relationships (Noga, 2012). In this context, a media childhood means multimedia which are valuable from the point of view of the development and education of the child; then, it really becomes a childhood: cheerful, attractive, interactive and community-filled, thanks to the possibilities of communication, being active in the world of media, compensating for the deficiencies of family and the local environment, providing new opportunities to participate in culture, also performing also in the media – it becomes a childhood with modern educational and didactic opportunities.

On the other hand, there are accusations and information about threats. Many professionals see that spending too much time in front of the TV results in a lack of control over the programmes being watched, reduced activity, social and emotional disorders. However, going to extremes – from the total elimination of media to unrestricted access to them –

may constitute a serious threat to the socio-emotional functioning of children.

A media childhood is unfortunately marked by destructive changes. The threats posed by new media are largely caused by the irrational use of the competence of children in this area. Incorrect media relations cause negative changes in various spheres of a child's personality – cognitive, emotional and motivational, as well as social. Many hours each day of uncritical and passive submission to the impact of electronic media has an impact on the organization of child and family life. This may lead to neglecting responsibilities at school, work or home, outdoor activities, participation in readership culture and also higher culture (ibid). the area of extracurricular and outdoor activities is shrinking, everything is slowly being transferred to the amenity of four walls of a child's room. Very often, information published in media results, especially among the youngest recipients, in unwanted states and emotional experiences. Scenes filled with violence often cause aggressive behaviour.

New media are definitely changing the type and scope of interpersonal communication into a clear, progressive dominating relationship of intermediate character. It is communication with a keyboard, and increasingly only a screen, that becomes a kind of language. The frequent presence of children in the world of electronic media is changing the formula for making contacts. Increasingly, these contacts will become – by choice – short, rapid, shallower, task-aimed and simplistic in their form of

language (ibid.).

Very large benefits of new technologies, but also risks, are waiting in this space for the child; media education is encouraged, above all in the family and in school. Its main objective is the creation of favourable conditions at an early age and in educational situations, so that the child, supported by parents, teachers and educators, learns the use of electronic media, assimilating important skills involving the selective choice of media content.

Methodology

Working in a nursery and having an interest in media space in a child's life led me to conduct research on the use of new media technologies for preschool children at home.

The focus of my research is children of preschool age and new media. The aim of this theoretical research is to determine the role played by media in the life of a child aged 3–5 years. At the same time, the purpose of practical concerns is to put forward appropriate proposals to educate the child in the rational use of new media.

Determining the object and purpose of the study allows us to formulate relevant research problems. The main problem is the working question: What is the role of new media in the life of a child in preschool? Due to the general nature of the problem, it can be divided into the following main problems:

1. What are the new media that children have contact with in their homes?

2. How do they use new media?

3. How much time each day is devoted to the use of media?

4. How do parents care about the safety of their children online?

5. At what age does a nursery-aged child have the greatest contact with media?

6. Do boys and girls use media for the same purposes?

The solutions to these problems allow us to draw correct conclusions concerning the impact of media on a small child.

An analysis of contemporary literature as well as my own experiences and observations can be extended to propose the following main hypothesis: It is assumed that new media play a large role in the life of a child of preschool age, affecting his or her cognitive development.

With regard to the specific research problems formulated, one can assume the following specific hypotheses:

1. It is assumed that preschool children generally have access to smartphones, tablets, laptops, and, of course, television.

2. It is presumed that they use them mainly for various adventure and educational games for children, music, watching cartoons, learning letters, numbers and reading, and also learning a foreign language.

3. It is claimed that children spend more and more time using media, at the expense of time spent in the playground, or active play at home.

4. It is believed that children's parents care about the security of the network. They control the contents of what their children use, they enjoy the use of media together.

5. It is argued that children, as soon as they are in the youngest preschool group (2.5–3 years) have contact with media, and the o l d e r

the group the greater the media competence of children.

6. It is supposed that boys and girls use new media for similar purposes, but with varying frequency.

The following table shows the variables defined in the study and their indicators.

Table 1: Variables and their indicators

Independent variable:	- age
- Child of preschool age	- gender
Dependent variables:	
- New media	- types of new-media devices: tablets, laptops, smartphones, TV
- Objectives of the use of new media	- watching cartoons
	- educational games
	- other games
	- listening to music
	- learning letters
	- the science of numbers
	- learning to read
	- English language learning
- Time spent using media	- al all
	- less than half-hour
	- 0,5 - 2 hours
	- more than 2 hours
- Security online	- parental control

The method of diagnostic survey was selected, while the tool was a survey concerning the use of new media by children of preschool age. An adjunct method was the observation of children and discussions about media.

The research was carried out at a private kindergarten AQQ. Seventy parents of children aged 3, 4 and 5 years participated in the research.

The parents completed a questionnaire. Questions were closed and multiple choice.

Results

The study was conducted among parent regarding the competence of their children. Figure 1 shows the age and gender of the children studied.

Figure 1. Age and gender of children

	3 years	4 years	5 years
girl	12	14	10
boy	9	12	13
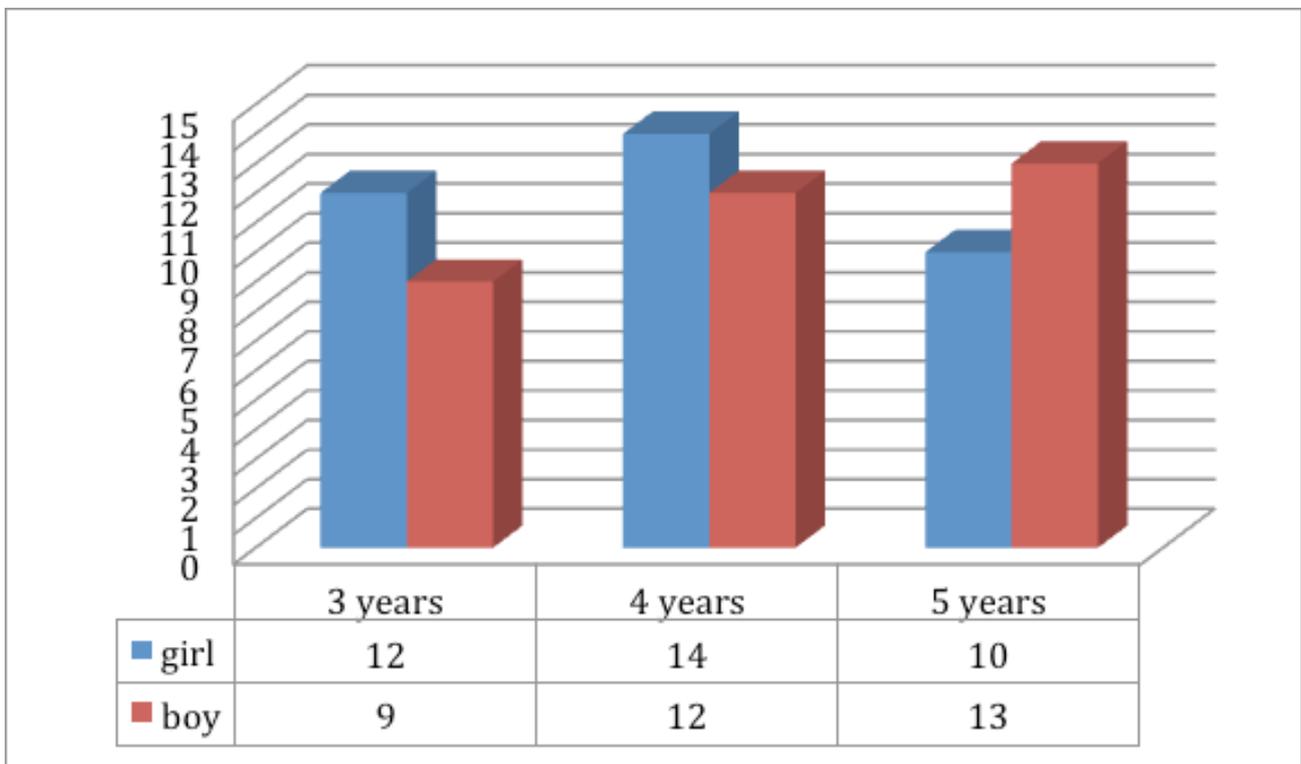
Figure 2. Types of media enjoyed by children

	TV	computer	laptop	tablet	mobile phone	lack of access
■ type of media	93%	11%	33%	53%	9%	2%
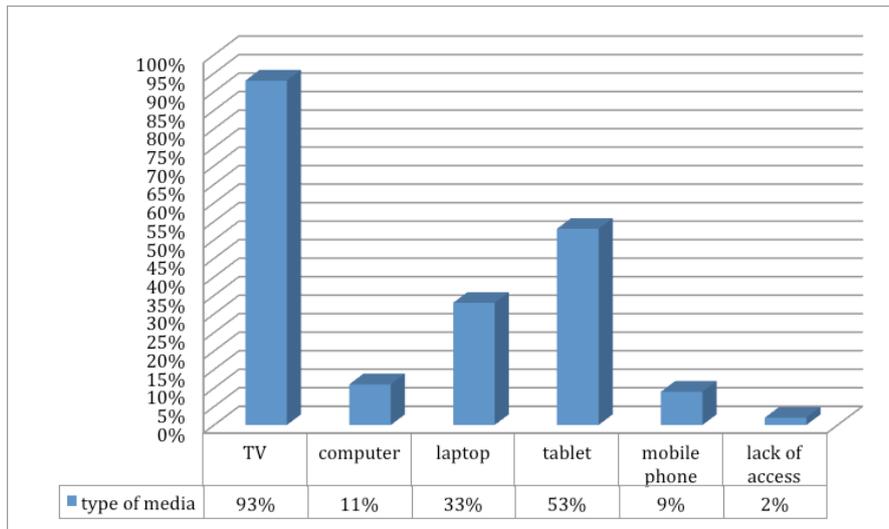
Figure 3. Time spent using media

	at all	less than half-hour	half-hour	0,5-2 hours	more than 2 hours
■ 3 years	4%	56%	27%	10%	3%
■ 4 years	1%	42%	39%	14%	4%
■ 5 years	1%	27%	29%	30%	13%

Figure 4. Use of media

	watching cartoons	listening to music	educational games and other games	learning a foreign language	learning numbers and letters	learning to read
■ use of media	80%	28%	76%	46%	55%	18%
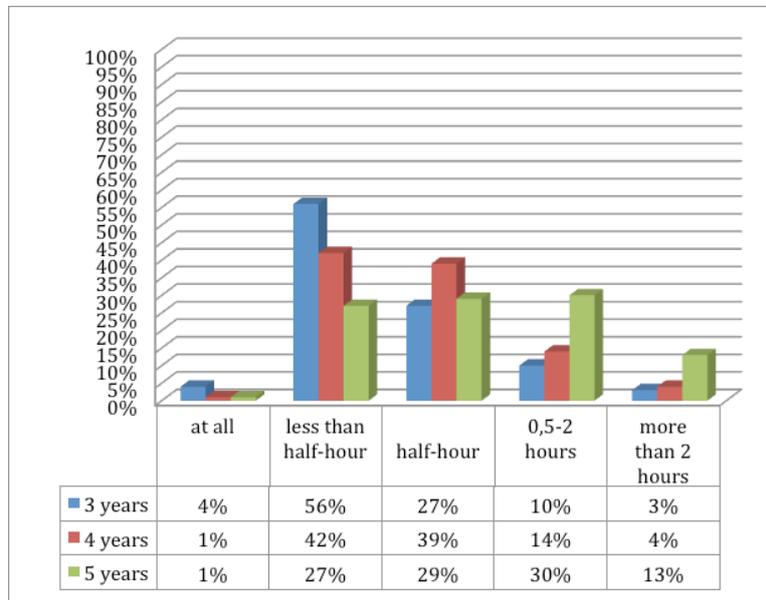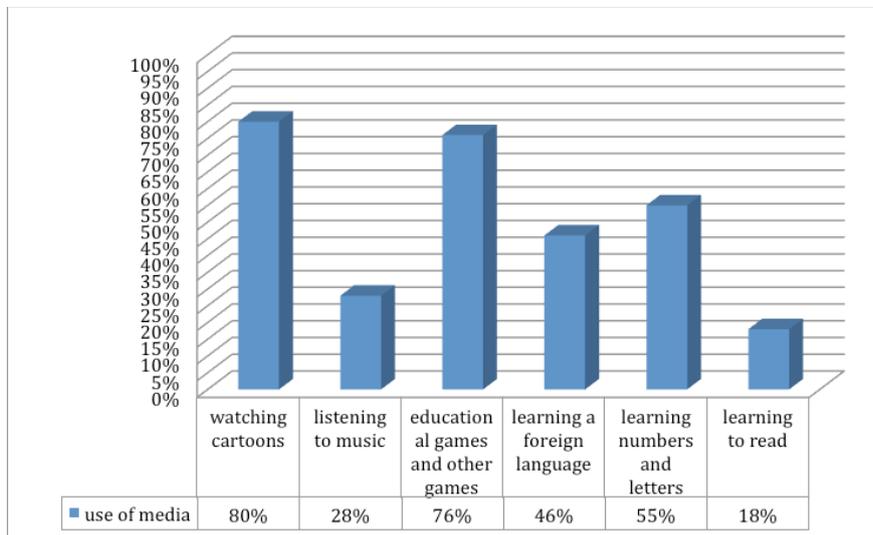
The graph in Figure 1 shows that among the children, there were 21 aged 3 years, 26 aged 4 years, and 23 children aged 5 years.

In the first age groups, there were more girls, while among the older group the majority were boys. The results in Figure 2 show that their children have access to media, they use them with great ease and are happy to reach out and use them. Most of the children (over 50%) primarily use tablets, which they own (having received them as gifts).

Less frequently they use laptops, the lowest number use mobile phones, but they are also efficient users of those lesser-used media devices. Of course, television is present in their lives (95%). Only 2 per cent of parents responded that their child has no media access at all.

Fifty-six per cent of the youngest children (aged 3 years) spend less than half an hour in front of a television or computer screen each day; for a significant proportion (27%). (See Figure 3).

it is half an hour to an hour; for only 3 per cent is it over two hours. For the four-year-olds, the duration of the use of new media increases. Many still spend less than half an hour, but almost as many children spend at least half an hour a day. The situation changes totally amongst the oldest children, where 30 per cent spend more than half an hour. Interestingly, 13 per cent use media for more than two hours. Therefore, it is proposed that the older the child, the more time is spent on the use of media. (See Figure 3).

What should also be examined is the purpose of the use of new media.The results are shown in Figure 4. What are new media used for by children? The results show that it is mainly for viewing fairy tales. That answer was indicated by 80 per cent of parents. In second place are different kinds of games, including educational and adventure (76%). In addition, using a tablet helps children to learn English by listening to different songs, games in which English language is the main one used.

More than half of the children learn numbers and letters. Fewer listen to music (28%) or learn to read (18%). Children aged 3–5 years use media mainly for entertainment and education. The next graph shows that the percentages are the same amongst boys and girls (see Figure 5).

Figure 5. Use of media by boys and girls

	watching cartoons	listening to music	educational games	strategy and adventure games	learning a foreign language	learning numbers and letters	learning to read
boys	39%	11%	34%	56%	17%	26%	8%
girls	41%	17%	42%	20%	29%	28%	10%

Figure 6. Parental control

	I don't take any action	I instal locks	I control content viewed by my child	Together with my child I benefit from new technology	I teach my child how to rationally use the new media
Parental control	4%	38%	63%	49%	20%

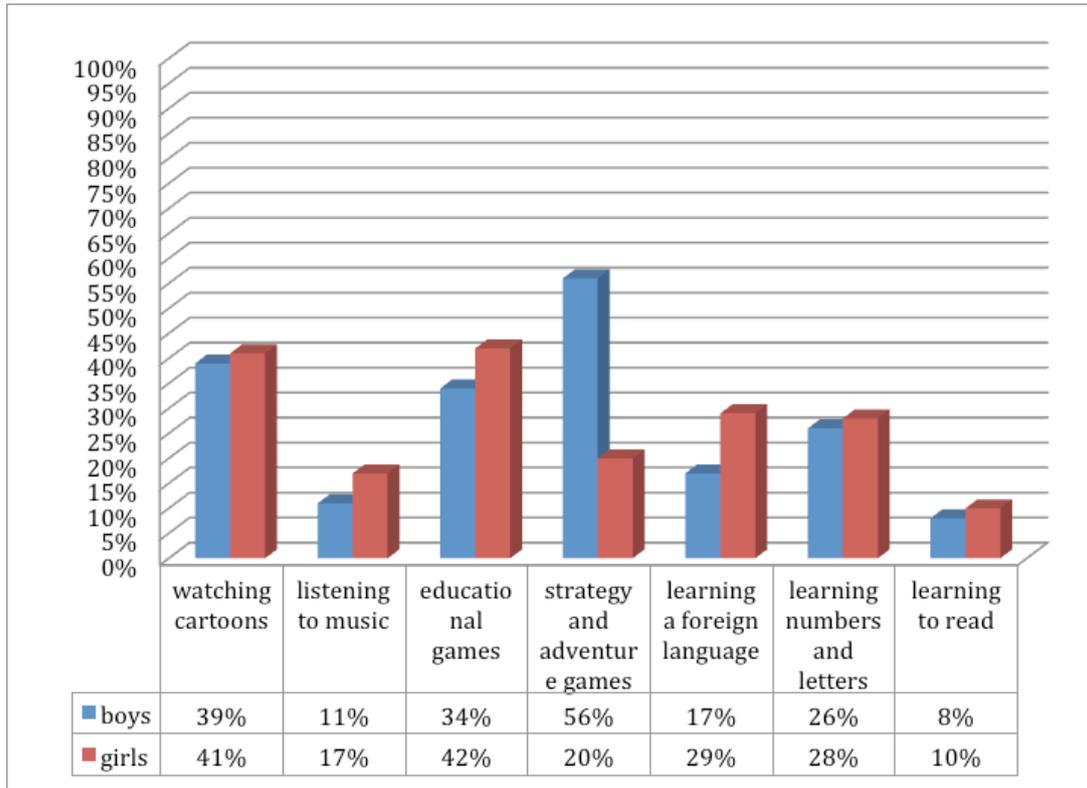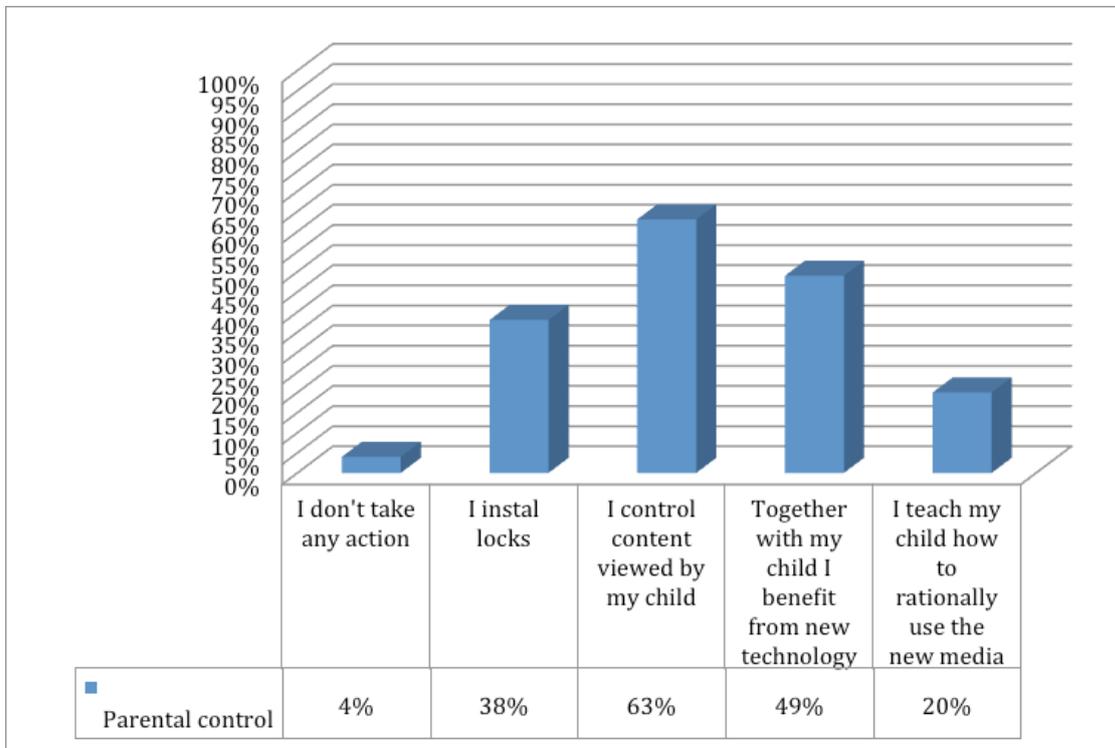Boys and girls use media for the same purposes. It is worth noting that boys often use tablets or laptops to play strategy and adventure games (56%), while girls prefer educational games (42%), they also listen to music more often (17%). In addition, they are more interested in learning a foreign language (29%), only 17 per cent of boys show such an interest. It can be understood that boys are more focused on entertainment, which is guaranteed by strategy games and adventure. The girls, in addition to being entertainment-oriented, are also keen on education.

Fortunately, virtually all parents care about their child's safety online (see Figure 6). Only 4 per cent of respondents did not take any action. They install locks designed to restrict access to undesirable sites or television programmes. Together with the child, they benefit from the new technology, they teach them how to use it rationally and they control the time spent 'with media'.

From observations in kindergarten, one can see that children also use smartphones efficiently, they can unlock them by themselves, take pictures, browse the photo gallery, turn off the alarm. They also often say what they are doing on their tablets, mainly share their impressions of cartoons they have watched, or music they have listened to. It sometimes happens that on entering kindergarten they have a parent's phone in their hand and like to play their favourite game. Also, frequently, parents download a new game for their child and experience with them the events of 'achieved' levels. Preschoolers often react by crying or screaming when parents do not want to give them their phone or tablet.

Conclusion

From an early age, media play a significant role in a child's life. At home they have continuous access to them. Children, especially the youngest ones, need direction to show them the right way to proceed at each stage. Adults teach them to walk, talk, ride a bike, build sandcastles, dress and eat. Their task is also to show a child how to use a phone or a computer. They should not use media as a "sitter" for their child, due to the fact that neither computer nor TV teaches dialogue. Children spending their free time only in front of a computer or TV reduces their physical and social activity (increases body weight, reduces the number of friends). In today's world, children's access to media seems inevitable; therefore, familiarizing oneself with the prevention of cyber-bullying is the responsibility of parents. Media can offer many benefits associated with the education of the youngest generation, one only needs to use them rationally.

Analysis of the results shows that a child at nursery stage can cope efficiently with electronic devices. New media are mainly used to watch cartoons, learn English and have fun, whether provided by computer games or the Internet. Boys are more entertainment-oriented, but girls want to learn something. The time they spend in front of a computer increases with their

age, so less and less time is spent on movement and in the open air. It is very important that children at that age are not left alone in the world of media, there should be parents present who control their actions in this new world of images and animation.

Therefore, nursery children acquire a lot of media competence that can make their lives fun and educational. They cope well with new technology features and learn faster than their parents and teachers.

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The use of mobile devices in the development of reading comprehension skills

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Abstract

We propose to investigate the role of mobile devices in the development of reading comprehension skills in the primary education. To carry out this research we will use a development research methodology, because it provide practical input and at the same time, scientific contributions, always with the aim of finding solutions to our educational problems. Through flipped learning and gamification pedagogies we try to build a new model in the teaching and learning of reading, in different teacher training modules. We try also to include mobile devices in an educational context to improve the reading comprehension skills of learning.

We intend with this investigative process that there is an effective improvement of learning outcomes in the Portuguese language, in the specific with reading comprehension.

Keywords: Mobile learning, pedagogical innovation, teacher training, gamification, flipped learning, reading skills

Introduction and theoretical framework

We live in a society that has developed in almost all areas, yet it is slow to update in education. Generally, students live in the twenty-first century, with teachers who run after them with pedagogies from the twentieth century in classrooms that remain frozen in time and comparable, in all too many cases, to classrooms from the nineteenth century.

Portuguese language education reveals three dominant problems. The first is that our primary-education students continue to have weak results in the area of Portuguese (IAVE, 2014; 2013; 2012; 2011; ProjAvi, 2012).

The second problem is that mobile devices are popular among students and they have educational potential, but teachers do not use them to learn. So, most students prefer and do use new technologies, mostly mobile devices such as tablets or smartphones, to communicate and learn anywhere and at any time (Attewell et al., 2014; Kukulska-Hulme, 2012), which is still

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not allowed in the language classroom. We see that students are using their phones and tablets to search for information on the Internet, to read information, to play games, and many other activities. The educational process must avail itself of this behaviour. The third problem is related to the previous one, in that teachers do not change their teaching practices, in spite of acknowledging the existence of problems related to the non-acquisition of language and literacy skills (Mascheroni & Ólafsson, 2014; Simões et al., 2014; Yoon et al., 2007). We also see that teachers do not innovate in their teaching practices, particularly in reading learning contexts, and they do not use the mobile devices that students use in informal spaces that could be a solution to promote innovative pedagogy and try to take advantage of this technology for learning.

The inclusion of these devices in the classroom, building a new paradigm in the process of teaching and learning, has been assumed to be a possible way to transform teaching practices and improve learning outcomes, and we assume this is also possible for language and literacy education. In particular, we think that the integration of mobile technologies into schoolwork and teaching methods could take advantage of their full potential to support the learning and development of reading skills in Portuguese.

Today, opportunities to access information happen anytime and anywhere, as stated previously. Mobile devices are increasingly popular among students and the first choice for Internet access. We know that students have these devices, and it is therefore urgent to use them in educational contexts (formal, informal and non-formal) and take advantage of their potential to help students acquire skills.

We also that students master the technological aspect of their equipment, which they use them in various activities, thus facilitating the task of the teacher, who does not need to know about the technology, just explore it from a pedagogical point of view.

Students do not have any trouble searching for and finding information, but they have many difficulties in selecting the right information and analysing it properly, resulting in the teacher having a new role of regulator and companion throughout this new process.

On the one hand, we are faced with a new type of student due to the use of a new type of technology (mobile); on the other, we find teachers struggling to adapt to this new reality, not knowing what to do with the equipment in terms of educational use in the classroom. There is a real need for teacher training to help teachers adapt to this new type of student, and provide teachers with innovative teaching skills.

A major contribution of mobile devices is to give students the opportunity to experience the excitement of engaging in pursuing the knowledge they really want to find. An introduction to the potential of multimedia applications, tailored and appropriate to the context of learning, serves as an important

tool in the dynamics of the classroom, supporting students being in a state of having a predisposition to learning.

Authors such as Djajadiningrat, Frens and Overbeeke (2004) or Hornecker and Buur (2006) defend the added value of mobile devices because they are tangible systems which put emphasis on the interaction between user and task, making the manipulation of content look much more natural, avoiding forcing her to deal with the accuracy of using a computer mouse, avoiding additional cognitive load and allowing him to interact with the content.

Today, then, teachers have at their disposal various mobile devices and digital resources that allow them to improve their teaching skills. These mobile devices along with pedagogical innovation processes are revolutionizing the way we teach and learn, but also transforming the perceptions of what is really important to learn in today's society.

When used properly and conscientiously, mobile devices relate closely to and interdepend on our daily lives, and they give teachers a new set of skills to enrich their teaching practice and teaching-learning processes (Carvalho, 2012; Kukulska-Hulme, 2012).

We note that there is a great familiarity among students with these mobile devices, being a multimedia technology that is used every day, is portable and mobile (Pachler et al., 2010), and it facilitates and expands access to information and new forms of communication that feature in various

formats (text, image, sound, video), attributes that are increasingly referred to as enhancers of use (Attewell et al., 2014; Carvalho, 2012; Kukulska-Hulme, 2012).

For Moraes and Torre (2004), teaching strategies should promote learning that integrates several senses: imagination, intuition, collaboration and emotional impact. Aesthetic aspects, such as image, video and music (multimedia) add a degree of sophistication in relation to the educational process, as they offer experience and interactivity, thus connecting senses, feelings and reason. When we get students involved in this process, and it becomes an active part of the learning process, we know that the educational chances of success also increase exponentially. The greater is the involvement of the students in creative manipulation, research and interaction with their own knowledge, and the discovery of new forms of knowledge expression, the greater is the didactic effectiveness of this process.

Thus, there is school transformation through use of the Internet and mobile devices (Attewell et al., 2014; Moura, 2012), the mobility of students, contexts and content. This moment becomes an opportunity for teachers to improve and transform their educational practices, and how we connect and interact with our students.

Furthermore, we also find that reading is a mental process of interaction with a written text during which the active player uses specific mental processes which are

effective for the construction of meanings with different levels of complexity (decoded, inferred and elaborate), assuming a critical and desirably controlled position. Teaching reading is synonymous with explicit teaching and practice in these cognitive processes (Irwin, 1990).

But reading in a digital communication context is very different today from what it looked like in the past due to its overwhelmingly multimodal, inherently social, constantly monitored and immensely playful character (Kress & Van Leuwwen, 2001). In the context of the digital age, reading means the construction of meanings that integrate information represented in different semiotic modes, such as verbal language (oral and written), visual (colour and images), sound, space/layout, gesture and touch. Also, to read today implies immediate (and ubiquitous) access to other texts (through networking, accessing texts designed by others) that are related or relatable to the text one wants to understand. Digital reading requires close management and immediate control of all phases of such an unpredictable meaning-making process. This is a playful approach to reading, which manifests itself in action and strong involvement by the reader, especially (though not exclusively) in gamification contexts.

Reading is made semiotically richer by making immediately available relevant cultural knowledge to understand a text and promote deep emotional involvement of the reader in a digital context. Reading in a digital context facilitates the process of constructing meanings of texts with different natures (literary, non-literary) and this does not seem to radically change the essence of reading: reading remains a meaning-construction process.

Building a new paradigm for the process of teaching and learning needs to begin with the teachers, since they are the designers and facilitators of the learning processes that take place in classrooms. However, only if teachers have the necessary knowledge can they implement such a pedagogical transformation. This means that teachers themselves need to become proficient users of these media as a first step so that the integration of smartphones and tablets in the classroom can be achieved, with gains for all parties (Kukulska-Hulme, 2012).

Methodology
The main aim of this research project is to study the introduction of mobile devices in the educational context in order to develop reading comprehension skills in primary-school students.

Our research question is:
How can reading pedagogy be transformed in primary education through the use of mobile devices?

This is also our general objective, to transform reading pedagogy in primary education through the use of mobile devices. The specific objectives are:

a) To promote the accumulation of professional knowledge about the

pedagogical uses of mobile devices;

b) To promote the accumulation of professional knowledge about reading pedagogy supported by mobile devices;

c) To promote the design and implementation of teaching reading practices supported by the use of mobile devices.

This study follows a Development Research methodology (van den Akker & Plomp, 1993; Richey, 1994; van den Akker, 1999; Coutinho, 2008; Richey, Klein & Nelson, 2004; Lencastre, 2012). This is a multi-methodological or mixed investigation model that combines quantitative and qualitative methods, e.g. document analysis, case studies, surveys and interviews, observation and software-logging.

This applied research aims to solve a specific problem found in everyday practice by proposing a prototype solution based on a theoretical framework (Coutinho, 2008). In our case, we are developing a digital platform to support the educational process beyond the classroom by facilitating the implementation of cyclical and spiral processes (action-research logic). This methodology has the advantage of being a cyclical and spiral process, with intervention, feedback evaluation and reflection, that allows us to return to intervention in order to improve the digital platform and transform pedagogical practices.

The platform was created to support trainee teachers and the implementation of new teaching practices. It also has a gamification component, whereby teachers collaborate, construct resources, design their interventions and reflect on the teaching of reading practises. This platform will also be a place where the students can collaborate, like a virtual classroom, and it is because of that that we can talk about mobile learning and not situated learning.

The intervention will be carried out with a group of primary-education teachers (n=22) working in schools in the north of Portugal, and it will be structured as two main stages. First, teachers will participate in accredited training designed to familiarize them with a variety of innovative pedagogical scenarios, such as flipped learning and gamification, and these will always be combined with reading activities. This first stage will also provide teachers with technical and pedagogical skills to use mobile-learning pedagogy (Attewell et al., 2014; Kukulska-Hulme, 2012; Shum & Crick, 2012), using different mobile devices and apps. In the first module we will explore with teachers some pedagogical models, such as mobile learning in project-based learning, problem-based learning, enquiry-based learning, flipped learning and gamification.

The training will, furthermore, provide teachers with knowledge about how the digital reading comprehension process may be enhanced and integrated with the pedagogical model of mobile learning. Mobile devices (and different apps) will be explored as tools that afford multimodality, networking, monitoring and playfulness, thus allowing new reading processes. This

will be the second module of the trainee teachers' process.

Secondly, we will supervise and monitor the implementation of an educational intervention intend to apply the imparted knowledge in reading comprehension with 8-years students. We will follow two of the teachers (that have done the training module) in the intervention of their classes – about Reading comprehension practices. We will do 2 case studies with this two teachers of the 3rd grade of the Primary Education.

To date, we have taken these steps:

1. Document analysis.
2. Survey of all training activities for "Mobile Learning" accredited in Portugal.
3. Literature review on mobile pedagogy, digital reading, teacher development.
4. Design, validation and accreditation of Module I of a teacher-training programme (CCPFC/ACC-84797/15 'Aprender com dispositivos móveis – Mobile Learning em cenários de Flipped Learning e Gamification').
5. Construction of the SUPERTABi platform (training and monitoring).
6. Platform usability test (technical and content experts).
7. Testing and validation of the training model during a process of higher-education mobile learning at the University of Porto.
8. Testing and validation of the training model with primary-education teachers.
9. Participation in 'CLAN' and 'BLIC & CLIC', two applications of ERASMUS+ on mobile-learning projects in the classroom
10. Implementation of Module I of teacher training (mobile learning in scenarios of flipped learning and gamification).
11. Designing one innovative classroom lab (at AEGMMaia school) and the learning models: project-based learning, problem-based learning and enquiry-based learning, that provide six learning zones.

Our innovative classroom lab comprises six different learning spaces. Each space highlights specific areas of learning and teaching and helps to rethink different points: physical space, resources, changing roles of student and teacher, and how to support different learning styles.

a) Create zone – allows students to plan, design and produce their own work, e.g. a multimedia production or presentation. In the create zone, the simple repetition of information is not enough: students work with real knowledge-building activities. Interpretation, analysis, teamwork and evaluation are important parts of the creative process.
b) Interact zone – the teacher can use technology to enhance interactivity and student participation in traditional learning spaces. One challenge of the traditional classroom setting is getting all students actively involved; technology enables each and every pupil to contribute. Solutions vary from individual devices, like tablets and smartphones, to interactive whiteboards

and interactive learning content. In the interact zone, learning involves both teachers' and students' active engagement.

c) Present zone – students will need a different set of tools and skills to present, deliver and obtain feedback on their work. The presentation and delivery of students' work has to be factored into the planning of lessons, allowing students to add a communicative dimension to their work. Sharing results can be supported by a dedicated area for interactive presentations which, through its design and layout, encourages interaction and feedback. Online publication and sharing are also encouraged, allowing students to become accustomed to using online resources.

d) Investigate zone – students are encouraged to discover for themselves; they are given the opportunity to be active participants rather than passive listeners. In the investigate zone, teachers can promote enquiry- and project-based learning to enhance students' critical thinking skills. Flexible furniture supports this concept, and the physical zone can be reconfigured quickly to enable working in groups, pairs or individually. New technology gives added value to research by providing rich, versatile and real-life data, and also by providing tools to examine and analyse.

e) Exchange zone – teamwork takes place while investigating, creating and presenting. The quality of collaboration is composed of ownership, shared responsibility and decision-making processes within groups. ICT can help to create a richer way of communicating and collaborating.

Collaboration in the 21st-century classroom is not limited to face-to-face and synchronous communication, it can also take place online and asynchronously.

f) Develop zone – a space for informal learning and self-reflection. Students can carry out schoolwork independently and at their own pace, but they can also learn informally while concentrating on their own interests outside the formal classroom setting, both at school and at home. By providing ways to foster self-directed learning, the school supports learners' self-reflection and meta-cognition skills. The school encourages its students to engage in true lifelong learning by acknowledging and validating informal learning.

This research project also has some formal agreements with diverse entities, such as schools, a teacher-training centre and a technology/educational company that will equip schools, which had to be established to make this study feasible. In addition, we have established a partnership with the University of Wolverhampton (UK), so that our study can have close connections with a leader in educational innovation using mobile technologies 1:1 in the classroom, with the governmental Team of Resources and Educational Technology Education (ERTE) (in Portugal) in order to have their formal support and with European Schoolnet Academy that supports us in this model for an innovative classroom lab with six learning zones. All formal agreements and partnerships have been successfully concluded well succeeded and all implied ethical concerns implied have been considered.

Figure 1 – Six-learning-zones environment

Figure 2 – 3D future classroom lab – six learning zones

Expected Results

Through this research, we expect to better know how to use mobile devices in the classroom in order to improve the reading-comprehension skills and motivation of primary-school students.

Thus far we have finished the first teacher-training module. This programme has completed fifty hours with 22 teachers of primary education.

After this first module, we drew some conclusions about the implementation of the training programme. Some of the strengths from the teachers' viewpoint are their confidence in the affordances of new digital resources (platform, tablets and apps). Also, they have confidence in the new pedagogy of flipped learning, gamification and collaborative work, due to its enactment in their own training programme. Teachers have gained experience themselves as learners in every dimension of the new pedagogy using tablets to do learning tasks, and that was very important for them. Another strength of the training programme was their understanding the ubiquitous nature of mobile learning. They also think that expansion of the concept of 'classroom', going beyond four walls and into attractive spaces, is an advantage, and they recognise having greater ability to focus on students by making them more active and autonomous in their learning processes. There is recognition of the facility to assume the role of moderator in the teaching process, and they feel engaged, motivated and more reflective because of having become knowing and experienced digital learners.

However they also think there are some weaknesses, e.g. there is not enough time to know all the affordances of each application and also not enough time to actually learn new knowledge. They feel that 22 teachers was too big a working group and the end of school year was not the best time to implement this with trainee teachers. A very problematic issue was Internet accessibility in the school, because they have many connection problems and it became difficult to implement the new practices with students. We also detected some preconceptions about the 'informal' technology used by students and strong preconceptions about the new, playful pedagogy to teach language and literacy (seriously) in formal classrooms.

The next step is implementation of the second module of the training programme in September of this year. But we will have to rethink the programme, as our development methodology advocates. All of these aspects are to be taken into consideration in the design and implementation of future steps of the development programme in our research.

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'The tablet is my BFF': Practices and perceptions of children under 8 years old and their families

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Abstract

This article explores the practices of children under 8 years old with a tablet, focusing particularly on the home setting and on learning activities. Previous research has shown that children are being born in digital homes and coming into contact with digital media at increasingly younger ages. Also, the tablet is young children's favourite device. Our approach is qualitative, using interviews with families, articulated with activities suitable for children of this age range, and also participant observation. Our results show that the tablet is the children's favourite, due to the variety of activities it facilitates and also its portability, and children frequently have their own personal device. Their preferred activities are games, usually related to cartoon characters or toys that they already like, and these are significantly gendered. Children reveal developed digital skills, about which parents are frequently unaware. Both for parents and children, the tablet is regarded as a "toy", and thus its pedagogical potential is under-explored. However, children learn other types of skills, such as problem solving, and independence. Most parents believe that children are not yet, at such a young age, exposed to many online dangers, mostly because they do not interact in social networks. Hence, parents monitor time of use, but not content. Yet children are actually exposed to risks, mostly on YouTube.

Keywords: Children under 8, young children, tablet, use practices, learning, digital technologies.

Introduction

Due to the fast pace of technological development over the last few decades, children are being born in digital homes and coming into contact with online media at increasingly younger ages (Hague &

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Payton, 2010; Kucirkova, 2011; Plowman, Stevenson, Stephen & McPake, 2012). Younger parents, aged from 25 to 45 years old, are themselves savvy digital users, and they allow their children access to a great variety of Internet-connected digital media (Findahl, 2013; Xiaoming & Atkins, 2004; Barr et al., 2005; Rideout & Hamel, 2006; Aidman, Heintz, Mazzarella & Wartella, 1990).

Most research on children's digital practices has, however, studied children over 8 years old (Arroz, Figueiredo & Sousa, 2009; Mawson, 2013; Given et al., 2014; Vatavu et al., 2014; Plowman, 2015), and thus our research addresses this gap.

Previous research points to the tablet as the preferred device for this age range (Chaudron et al., 2015; Plowman, 2015), one of the favourite "toys", a must-have for young children.

1. Children and tablets
1.1. Favourite activities
A report by OFCOM (2013) reveals that the use of tablets by young children is increasing rapidly among children from five to seven years old, and the most common practices are watching videos, playing games and browsing the Internet. Another study by CommonSense (2013) corroborates that three out of four children have access to mobile devices (smartphone and/or tablet) in the home. About practices, this report highlights games, watching videos or films and reading books.

Cotten, Shank & Anderson (2014) report

gender differences in the digital practices of children: boys predominantly play games, while girls engage in more diversified activities and multi-task more frequently.

Parents wish to share digital activities that they can enjoy with their children and also recognize that mobile devices are very efficient in keeping children entertained while they are busy with work or house chores. Thus, they allow children to use their devices from an early age, and eventually acquire personal devices for them (Plowman et al., 2008; Kucirnova, 2011; Genc, 2014).

1.2. Role of parents
Several studies agree that, at such an early age, although they are largely able to explore digital media independently, children often need guidance and support. Parents play a pivotal role, as they are the first mediators, it is with them that children share their first digital experiences. Children tend to look up to them as role models, and to mimic their practices and preferences (Warren, 2003; Livingstone, 2007; Plowman et al., 2008; Bittman et al., 2011; Craft, 2013; Kucirnova & Sakr, 2015; Lauricella, Wartella & Rideout, 2015).

The concept of parental mediation refers to the role played by parents as mediators of children's engagement with media, thus shaping their practices and perceptions (Dorr et al., 1989; Sang et al., 1993; Valkenburg et al., 2009).

More recent research on parental mediation has focused on digital media (Morentin et

al., 2014; Nikken & Jansz, 2013). There are several proposals that may be summed up as two trends: a) on the one hand, there are parents who control how their children use digital media (with younger children parents are more worried about time of use than content); b) on the other hand, there are parents who find engagement with digital technologies beneficial, and thus they support, help and teach (Barkin et al., 2006; Eastin et al., 2006; Rosen, 2008; Valcke et al., 2010).

1.3. Perceptions and attitudes; benefits and risks

The perceptions and attitudes of children concerning tablets are positive. McKenney & Voogt (2010) found that attitudes become increasingly positive as children grow up, as they become more frequent and diversified users. Also, girls usually have more positive attitudes than boys. This may be explained by the diversity of their uses, while boys mainly play games.

Concerning parents, Plowman, McPake & Stephen (2008) discuss the "technologization" of childhood, claiming that most parents do not regard this process as negative. In fact, most parents believe that digital technologies are important tools for their children's professional future. Others add that they are a source of learning (mostly informal, because at such a young age children do not engage in many pedagogical activities on a tablet, neither at school nor at home). More negative perspectives are usually found among experts who tend to highlight the risks to which young children are exposed.

Barreto & Adams (2011) studied parents' perceptions of online dangers. Parents of children over 12 identify several risks, namely addiction, excessive digital immersion, disclosure of private information, plagiarism and cyberbullying. But parents of younger children do not perceive so many dangers, especially if children are not yet active in social networks. Parents of preschoolers (from 3 to 5 years) fear most for their children's health, as they may get too excited or tired if they play for too long.

2. Methodology
2.1. Research questions

This article explores the following themes: a) the integration of a tablet into a home and the family dynamics associated with this device; b) children's practices of use, their competencies, difficulties and preferences; c) the perceptions of parents and children concerning tablet use, focusing particularly on benefits versus risks.

2.2. Research design and sample

Our approach is exploratory and qualitative, and our main method is semi-structured interviews. These are supported by other techniques in order to facilitate data collection and encourage the participation of young children (e.g. board games, 'digital tour', activity with stickers), and also by participant observation.

We interviewed a sample of 25 families,

with children from 3 to 8 years old, who used at least one digital technology, as least once a week. The sample was selected theoretically according to Strauss & Corbin (1998), in order to obtain variety of variables such as gender of the child, family composition (both parents vs mono-parental; without vs with siblings; older vs younger siblings) and socioeconomical level. The visits took place between June and November 2015 and involved a group activity and different interviews with parents and children. The data were gathered as audio recordings and photographs, as well as participant observation notes made by the researchers and subsequently coded using thematic analysis, following Boyatzis (1998) and Braun & Clarke (2006).

3. Findings and discussion

3.1. Table practices

The tablet is children's favourite device, as it is interactive, attractive and portable. As one mother noted, it is their "new BFF" (best friend forever). Children usually engage with one between finishing their homework and having their evening meal, or a little bit before bedtime. At the weekend, their use is more frequent. Most children have their own personal tablet. They mainly use it to play games, in many cases replacing a console, or even television, as they can watch similar content on YouTube. Children's tablets are loaded with games apps. Preferences concerning games are strongly gendered.

Watching videos on YouTube is the second most frequent activity mentioned by children. Another common activity is taking photographs, including selfies. Some of the children know how to edit them on apps, adding props and words. They also like making videos.

Children rarely perform any educational or pedagogical activity on a tablet. Very few use them to support them in doing homework.

The only cases of the use of educational apps were mentioned by girls. One of them had apps for learning English and Maths, but they are far from being her favourites: "I don't really like maths." These apps were installed by parents or suggested by teachers.

3.2. Family dynamics

Most of the time, children use a tablet on their own. When parents are busy, allowing them to play with a tablet is the perfect strategy to keep them entertained and happy. The tablet is the new 'babysitter'. Thus, this device is more often a 'companion' for children than a source of family interaction. This lonely use exposes children to risks.

Concerning rules, although Goh et al. (2015) report that parents are often permissive when it comes to digital media, parents describe frequent 'negotiations' with their children, while children perceive rules as being imposed.

Most parents set restrictions after observing negative consequences of using a tablet for too long. One mother claimed she cannot spend quality time with her son anymore.

Others justify this rule with the fact that children have trouble falling asleep if they use a tablet just before bedtime. PT7m and PT7f told us how their oldest son, 7 years old, modifies his behaviour when playing with a tablet, leading them to restrict its time of use.

There was another rule mentioned by all families: children may not install bought apps. Parents believe it is not worth 'spending money' on apps related to games, but most do not discard the possibility of buying educational content.

3.3. Perceptions of benefits versus risks

YouTube is one of the most frequently used apps. Children search for videos they like, using different strategies to overcome their lack of proficiency in reading and writing. They follow suggestions from the app in the search box, or they choose suggested videos. Other children know how to identify letters and ask their parents or older siblings how to write the words desired for their search, memorizing their shape to reproduce them later. Children also know whether or not they are connected to the Internet. They know where in the home to get the best connection, they acknowledge that their parents' devices are usually faster than theirs and they complain about not having Wi-Fi at their grandparents' houses.

In spite of children developing all these skills and resourcefulness to play with tablets, most parents undervalue both their children's digital literacy and tablets' potential for learning. So, the tablet remains a source of entertainment for children, in many ways a "toy" that extends other types of offline activities and preferences (Chaudron et al., 2014; Merchant, 2015).

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Online practices of children under 6: a grounded theory study

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Abstract

With this research we intended to know the practices of children with technologies in home environment. We opted for Grounded Theory, because we do not intend to base ourselves on existing theories, but to create new one. Semi-structured interviews and observations to 15 families were carried out in their homes. Families would have to have, at least, one child under 6 and (preferably) an older brother. Through the collect data we verified that children are surrounded by technologies and use it when they want, including children with 1 year old. They prefer the mobile ones, such as the tablet and the smartphone, but also use the computer, the television and game consoles. Gender is decisive in the chosen activities on the devices, which are used mainly alone and independently, leading to children mastering devices better than parents think.

Introduction

As a consequence of rapid technological and scientific development in today's society, a digital society, children grow up with and live immersed in technology. If we listen carefully to the dialogues of 6-year-old children we can hear words like computer, Internet, email, iPad, mouse, smartphone, Facebook or YouTube, which suggests that children have access to digital technologies, using them with ease and familiarity.

Through several research studies (Gutnick, Bernstein & Levine, 2011; Hamel & Rideout, 2006; Holloway, Green & Livingstone, 2013; Livingstone & Haddon,

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2009; Plowman, Stevenson, Stephen & McPake, 2012; Plowman, McPake & Stephen, 2008, 2010) we can see there is an emergent trend of children under 6 years old increasingly accessing the web, mostly in mobile devices such as tablets and smartphones This can result in progressively young people accessing the Web.

In Sweden, and most likely in other Western European countries, parents between the ages of 25 and 45 and experienced in technology (from a user point of view) are providing their children with access to a wide variety of digital media with Web connections (Findahl, 2013).

According to European research by EU Kids Online (Holloway, Green & Livingstone, 2013), most children up to 6 years old are accessing the Web and the majority of infants under 2 years in developed countries already have an online presence, i.e. a digital footprint.

In the last decade, several studies have found that young children are regularly accessing the Web. For example, in Sweden, in 2011, half of all 3-year-old children accessed the Web; in 2013, that was true for 2-year-olds (Findahl, 2013). In the UK, 33% of children aged 3 and 4 access the Web via a desktop or laptop, 6% access the Web on a tablet and 3% on a mobile phone; the number of children between 5 and 7 years who accessed the Web had increased by 68% compared to 2007; 9% of children between the ages of 3 and 4 used a tablet and 6% used it to

access the Web (Ofcom, 2013).

Children using the Web may bring benefits, but along with this exposure are some risks, such as explicit images or inappropriate language (Livingstone & Helsper, 2010; Ólafsson, Livingstone & Haddon, 2014). Therefore, the activities that children perform online and the risks they are exposed are an important issue to be studied, as it is increasingly important to promote online safety and training for parents of young children.

There is limited research on the role of the family regarding the use of technology by children under 6 years of age, most research puts emphasis on surveys that calculate the number of hours children use new technology each day (Plowman et al., 2012). This is because it becomes a challenge to involve children under 6 as active participants in research and gain access to families in their typical environment (i.e. at home) for interviews (Plowman et al., 2012).

Although young children are active Web users, policies usually target older children, especially teenagers. Consequently, little attention has been paid to the subject of online protection for young children, so the purpose of this research is to examine the perceptions of parents and family members with regard to use of the Web by children aged 6 and younger, in order to have a more in-depth perspective and also to get to know more about the digital activities that these children get involved with (via Web access) at home.

Methodology

The methodological approach is qualitative, this being considered most appropriate, because the main objective is to describe and develop an understanding of a particular situation (Burns, 2000; Creswell, 1998). In particular, we rely on grounded theory, because we do not intend to base ourselves on existing theories, but rather to create a new one (Glaser & Strauss, 1967) by searching and conceptualising social patterns. This new theory "will emerge from the data collection and analysis, inductively emerging from the study of the studied phenomenon" (Corbin & Strauss, 2008, p. 23).

We intend to have an in-depth look at a limited number of cases, in order to get as much information on the use of technology by children and families. We want to focus on their online activities, as well as the benefits and risks associated with these activities using technologies. A total of 15 Portuguese families were interviewed, each with at least one child of 6 years of age or younger. The families were selected taking into account criteria such as being at different socioeconomic levels (low, medium and high), having an older brother, their urban and suburban environment, being immigrants or in stepfamilies.

Semi-structured interviews were conducted in their homes, supported by appropriate techniques to facilitate data collection and motivate the participation of young children (e.g. board games, 'digital tour', activity with cards), and also by participant observation.

Findings

The tablet is the most popular device amongst families, especially for children because 'it´s big and you can see better', 'it has more games' and it´s a touch-device, allowing children to use it with their hands and fingers.

> Jb6: The tablet is bigger than the smartphone. We cannot use our fingers on the computer, we must use the mouse. But now the tablet is all about pressing with your fingers on the screen!

The second favourite device is the smartphone, especially for children under the age of 3 years, because it is lighter and smaller, making it easier to handle.

Most children use a 'family tablet' (one for everyone's use) while one third have their own tablet. Families at a low socioeconomic level tend to give children their own tablet. Families with more than one child but a tablet for each one to avoid quarrels amongst themselves, revealing difficulty in sharing.

Smartphones are seen as personal devices by parents and therefore it is mainly the father who places restrictions on their use by children. Nevertheless, children end up using the smartphones of both their parents, who, regardless of their economic level, own at least one. Tablets are primarily used at home, because parents are afraid a device might get broken if taken outdoors. A smartphone is used outdoors as an alternative device, especially in restaurants, 'for entertainment' [Hm].

Mf: While we are waiting for something, usually they use the smartphones, I'll hand them the smartphone so as to quiet them down. Also, when there are two or three of them they start annoying each other and so [it is]to keep them quiet... .

Both types of device are used whenever children wish to, and they use them mainly alone, most parents assume they do not have time to monitor their activities. A tablet is generally used in the evening, when children arrive home from school, up to evening-meal time, while a smartphone is used more sporadically.

Girls prefer casual games [3], where you can adopt a virtual pet or dress up dolls, while boys prefer action/ adventure games or role-playing games (RPG)[4], such as 'Grand Theft Auto' (GTA), games with their favourite characters from movies and cartoons, e.g. Spider-Man or Batman, or sports such as 'FIFA'.

YouTube is a very popular app, it is used to watch cartoons and movies and to listen to pop music and children's music. Girls prefer 'My Little Pony' movies. while boys like to watch 'Spider-Man' or 'Hulk'. Children under 3 years old also like to listen to music and watch cartoons on YouTube on a smartphone and to select content randomly by following suggestions presented by the app.

Gm: She [Gg5] knows how to access YouTube … I'll select a clip and she'll watch it, she's acquainted with the characters she likes the most, and so from there on she'll select those videos that include those characters in the suggested thumbnails. Even with Gb1, if I leave him watching cartoons on Youtube, as soon as the video is over he'll look at the suggestions and choose a new video to watch on his own. It's like kids are born taught already.

Due to unaccompanied use, most children end up watching violent videos on YouTube, especially on a tablet. Hb5 uses his father's YouTube account settings and usually watches mixed martial arts (MMA)[5] videos.

Hf: I have caught him watching most violent videos or that sort of stuff. The tablet is configured with my email settings and whatever I watch stays preselected, and suggestions are given according to the content I have previously watched. Sometimes I watch MMA videos.

Rules set by parents and hardware challenges inadvertently play an important

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[3] Casual games are games that are directed at players who do not want to devote much time and effort to the game. To progress in a game, the requirements are very low; nevertheless, they present the player with a challenge, performing tasks faster brings rewards. Usually these games are characterized by being colourful, with attractive graphics and sounds, and without negative connotations, such as violence or clashes; they reward the player with small, frequent bonuses, thus giving constant motivation. It is possible for the player to quit the game at any time.

[4] Role-playing games are action games involving eye-motor coordination and motor skills. They focus on the player, who is in control of most of the action.

[5] Mixed martial arts is a full contact sport between two people, including striking and grappling techniques.

role in self-taught learning experience. Witness the following examples:

Case 1. Parents limit devices so that only allow free apps can be installed. Gradually, children will learn how to browse an app store, and even without knowing how to read or write, they can distinguish which apps are free or to buy.

Case 2. A device will have a specific amount of storage capability, which means that, eventually, a child will be challenged with that reality when installing a new app. What we witnessed were children operating devices to understand which apps were occupying the most storage, deleting them and then installing new apps and moving them to labelled folders.

> E: Do you encourage her to explore any kind of didactic games?
> Jm: I know of no game that would interest her. Books are didactic.

Gradually consoles are becoming less popular, though children still enjoy them, especially boys. The most popular consoles are the PlayStation, the PlayStation Portable and the Wii. They have different roles in the family: the PlayStation already belonged to parents before children were born, i.e. it was an adult technology which was later passed on to children. The Wii console is seen as a family device, purchased for family entertainment.

Children who use portable consoles play individually, while children using non-portable consoles play with family members friends.

Since consoles are mostly used by boys, games end up being more related to sports or action/ adventure, like FIFA, where boys play with friends and family. Most games are violent and inappropriate for their age, such as GTA with a PEGI (pan-European game information) rating of 18+ (i.e. recommended for ages 18 and above), while games like 'Batman' and 'Spiderman' have a PEGI rating of 12+ (i.e. recommended for ages 12 and above).

During the interview, Fm shared that sometimes Fb3 shares some activities carried out in the 'GTA' game with his cousins.

> Fm: He came home telling [what he had been up to in the game], "I went to a club, I saw a lot of guns and I had a car," "it had girls, it had girls mum."

The personal computer is becoming neglected at home, especially by children. They will fall back to a personal computer when they don't have access to a tablet, a smartphone or an Internet Wi-Fi connection, or when tablet or smartphone games do not load properly; this is an event that usually occurs in grandparents' homes. Most families have a personal computer at home but prefer mobile devices because they seem to be easier to use and work faster.

A personal computer is more complex for children to operate and will require the assistance of an adult, be it for typing or how to interact with the operating system

by using the mouse.

Boys are more enthusiastic about using computers, mostly because they want to play online games like 'Batman' or platform themed games. They play on their own, without any adult supervision.

Television was a digital device less indicated by children and parents; however, it was the only digital device that was always on during the interviews, thus proving to be transversal to all the others. When they arrive home after school, after putting away their backpacks the first thing they do is turn the TV on to a children's channel. They sit on the couch and with the set-top box remote start searching for automatic scheduled recordings to see cartoons they missed during the day. The whole family (parents and grandparents) will end up watching cartoon channels.

> *Mf: I almost stopped watching TV because cartoons are always on.*

Discussion

Children from a very young age live surrounded by digital technologies in their homes (Marsh et al., 2005; Plowman, 2014), even children under 12 months of age are exposed to monitors and screens, living in a 'digitally fluent environment' (Palaiologou, 2014). They are very fond of using technology, especially mobile devices, such as tablets and smartphones.

Children view technology with one goal: to have fun. These devices are used as toys for entertainment and playing games that relate to real-life games they might already play. The important thing is the activity itself, technology is only a means to achieve it.

The knowledge held by children about using digital devices originates mainly from the home, where several digital media are always available. They learn to use them initially through observing close relatives, including older siblings and parents, deepening their knowledge through practice and the use of various devices, until they become independent.

There are gender differences in the games chosen: girls prefer more relaxed games while boys prefer sport or action/ adventure games. Most of the games preferred by boys are recommended for children older than 12 or 18, but that does not stop parents buying them for gaming consoles

In addition to games, watching videos on YouTube it is also a favourite activity, though this is an activity that a child will perform on their own. Parents are a little naive in this area, leaving children on their own with a tablet or smartphone to watch whatever they wish. In the case of the YouTube app, next to a video that is being shown it will present several related suggestions, this is where children are most exposed to potentially inappropriate content for their age. Parents are unaware of their own children's skills, children can search autonomously for videos and games and discover how to play them. They even acquire operating skills, such as installing and uninstalling applications and managing

a device's storage.

Children are consumers, not content producers; older brothers are also mostly consumers. Perhaps this is due perhaps to the lack of monitoring and experience in creating content, although most children have access to new technologies that are suitable for this intention.

Although children are proficient in the use of technology, schools do not capitalize on these skills and parents also do not recognize the educational gains from this use, restricting its use to entertainment purposes only. Educational opportunities are embedded in these digital devices or can be arranged by parents, siblings or other family members. As McManis and Guennewig (2012) report, 'experiences with technologies can open the way for unprecedented learning opportunities' (p. 14).

Information sessions for parents could explore the various applications and online platforms for younger children, focusing on various kinds of educational programs, informative and focused on entertainment, as well as online safety issues. If we provide children with more opportunities to get involved with several types of technologies and experiences, not only they will improve their operational skills, they will also engage in imaginative play in new and innovative ways.

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Paper 5

Teachers supporting transmedia play with classes of young children in the UK: Exploring new literacies through Alternate Reality Game design

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Abstract

In this paper I share the findings of my PhD study (Colvert, 2015) in which a class of 10- and 11-year-old designers created an Alternate Reality Game (*ARG*) for their peers as part of their school curriculum (The Mighty Fizz Chilla *ARG*). I also discuss a current study in which I am supporting trainee teachers to work collaboratively to design and play *ARG*s with and for classes of 8- and 9-year-olds (The Stolen Salt Cellar ARG) and 6- and 7-year-olds (The Mission to Marzipan *ARG*) as part of the final year of their degree studies. Drawing on both of these studies, I outline a pedagogical proposal for the teaching of new literacies in formal primary education and propose a new conceptualisation of transmedia play and associated literacies.

Keywords: Ludic authorship, game design, pedagogy, transmedia, converged play

Introduction

Although ARGs have been played in secondary classrooms (Bonsignore et al. 2012; Connolly et al., 2011; Niemeyer et al., 2009) and designed by university students (Chess and Booth, 2013), I argue that more opportunities should be given to primary-school children and their teachers to develop ARGs in class. ARGs utilise everyday online and offline technologies, such as books, websites, letters, emails, phone calls, films and photographs, to shape narratives which need to be pieced together. The quest structure of these games requires players to search for clues across modes and media and to collaborate with each other in order to solve mysteries and problems and compete games successfully. These games are therefore, in effect, a fictionally framed microcosm of the media landscape requiring players and designers to engage in the ontologically new literacy practices (Lankshear and Knobel, 2003) and principles of 'participatory culture',

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'convergence' and 'collective intelligence' that shape it (Jenkins, 2006). In designing and playing these games, children are given opportunities to master 'powerful literacies' (Cope and Kalantzis, 1996) that may support their civic engagements and personal endeavours both now and in the future.

The genre of ARG 'is not just a new direction in gaming but part of the more general evolution of media and creative narrative, and a reaction to our increasing ability and willingness as consumers to accept and explore many media in parallel, simultaneously' (Martin et al., 2006: 6). Although children are increasingly engaging with transmedia narratives (Herr-Stephenson et al., 2013) few are being given the opportunity to create them themselves. My PhD research represents the first academic study to investigate the literacy practices of children as they design and play ARGs with and for their peers in a primary-school setting. Burke and Marsh have suggested that 'innovative practice challenges educators to find a delicate balance between the digital and concrete worlds of play […] and provide contextually situated learning experiences that foster the participation of all children' (2013: 3). My research provides a pedagogical model of how this might be achieved through ARG authorship. Furthermore, Edwards has argued that, in examining the play of children in the early years of schooling, 'what matters is how play is understood to support children's meaning-making processes within the given temporal, cultural and technological context' (2013:

13). She suggests that what is needed is 'a conceptualisation of play that acknowledges the meaning-making processes associated with children's play experiences in relation to both traditional and converged play' (2013: 13). The model of transmedia play presented here offers one such conceptualisation.

Theoretical framework

In this study, ARG authorship is viewed from a socio-semiotic perspective as a literacy practice and communicative process which shapes and is shaped by the textual functions of the ARG and the discourses of the social context. In investigating literacies I draw on Green's model of 3D literacy (Green, 2012), with its focus on the cultural, critical and operational aspects of literacy practices, in combination with Kress and van Leeuwen's concept of communicational strata (2001), as well as the work of Burn and Durran (2007) which highlights the socio-semiotic processes involved in shaping discourse through multimodal design, production, distribution and interpretation. In order to research ARG authorship I needed to devise a hybrid conceptual framework, hence I constructed a Venn diagram to represent the ways that literacies and the processes of authorship intersect (Fig. 1):

Figure 1: A conceptual model of ARG authorship (Colvert, 2015)
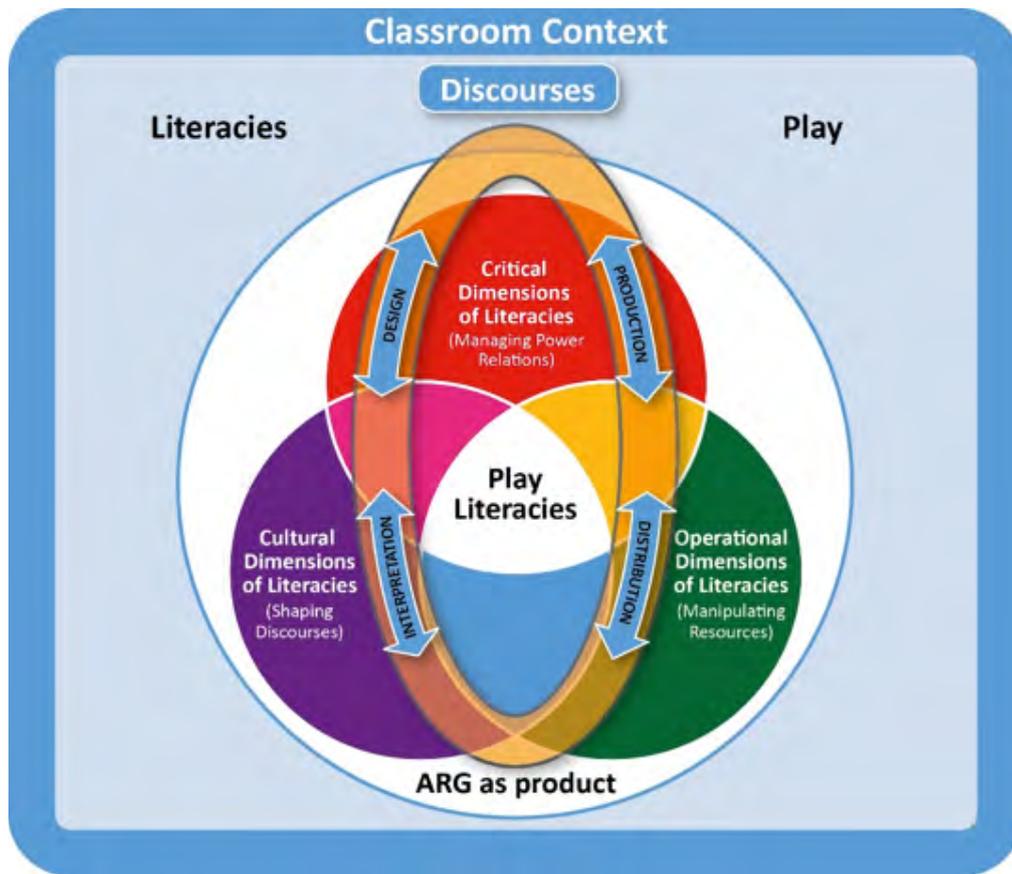
In this model, the processes of design, production, distribution and interpretation impact on the discourses (such as play and literacies) and social context (such as the classroom), as well as the literacy practices, of designers. The communicative process also shapes texts that form a part of the ARG; the solid circle represents the ARG as product, with its associated textual functions: orientational, textual and ideational (Halliday, 1989). In an ARG it is the textual artefacts which give rise to the feedback loop between players and designers. This feedback loop, and the broader game system (including representations), informs the processes of design, production, distribution and interpretation and shapes the discourse of play. Although this hybrid conceptual framework of authorship informed my PhD study of ARG authorship practices in the classroom, in my current study I am appropriating the model of literacies which has been developed from mine by Sefton-Green *et al*. (2015) in *Establishing a Research Agenda for the Digital Literacy Practices of Young Children: A White Paper for COST Action IS1410*. Their model usefully builds on and extends the scope of my model, and better highlights and foregrounds the range of social contexts which frame children's engagement in digital literacy practices and within which the processes of meaning making take place (see Fig. 2):

Figure 2: Processes of, and contexts for, children's digital literacy (Sefton Green et al 2015: adapted from Colvert, 2015) Practices (Sefton Green et al. 2015, adapted from Colvert, 2015)
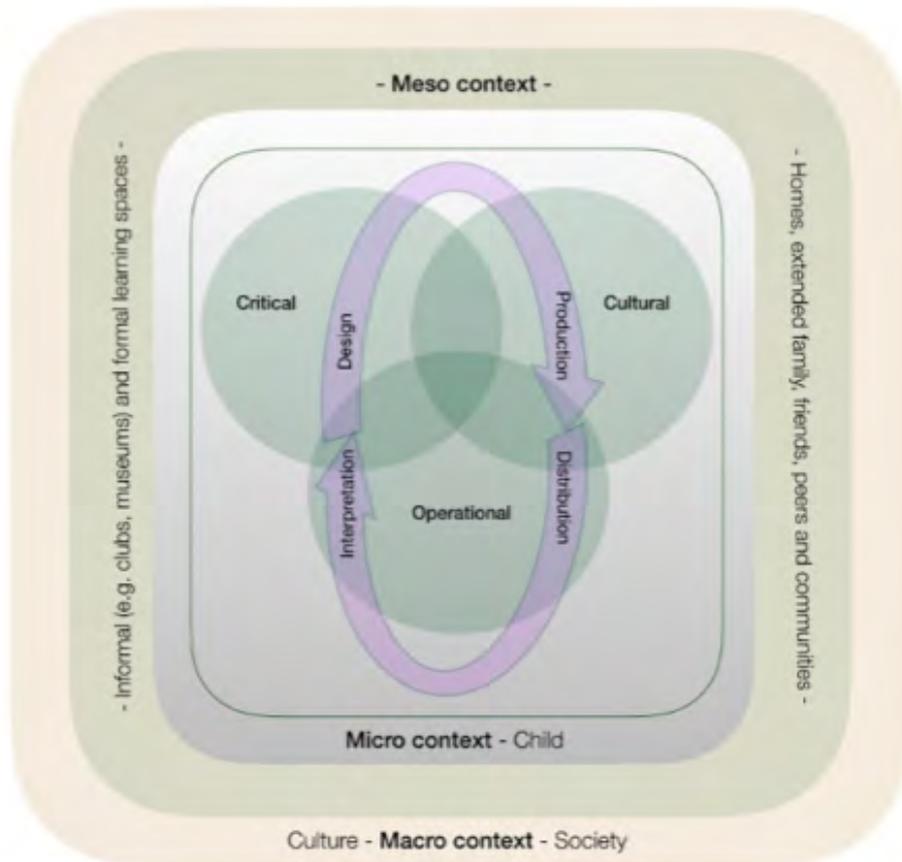
This new model will be very useful when framing my current research, which will involve a broader investigation into the impact of the macro, meso and micro contexts on ARG design and play in a range of schools.

Methodology

My PhD research was undertaken as a teacher-researcher in a large London primary school. I ran a year-long project in which a class of 10- and 11- year-olds designed an ARG for 9- and 10-year-olds in the same school. Data were collected throughout the planning, making and playing stages and included field notes and observations, texts created by the players and designers, and interviews with the designers. When analysing the interviews, thematic coding was used to research the designers' design intentions and authorial concerns. In order to discover more about the extent to which the texts the designers produced reflected the key authorial concerns expressed in the interviews, I undertook a socio-semiotic, multimodal analysis of the websites, films and artefacts. In doing this, I examined the ways in which designers combined modes and media to shape meanings within the social context of play.

In my current research project, as a senior lecturer-researcher, I am supporting trainee

teachers to undertake ARG design with their classes and investigating their experiences. The aim of this new research is to explore the efficacy of the pedagogical model of ARG authorship, developed during my PhD, in a range of new primary-school contexts. I have been collecting data throughout the planning, making and playing stages of each ARG we have created. I have also collected the trainee teachers' written reflections on the design process. I am currently in the process of contacting all the trainees who have taken part in the ARG design course, who will now be in their early years of teaching, to find out whether they feel that the course has had any impact on their teaching practice. In the coming year, by analysing data from questionnaires and interviews, I hope to begin to identify the challenges that teachers face when exploring new literacies with their classes and, if they have undertaken transmedia play with their classes, discover more about the learning opportunities this has afforded and the pedagogical conditions and approaches which made these possible. This new research focus is important if we are to understand how personal experiences of teachers, school contexts and developments in UK educational policy support or exclude opportunities for ludic authorship in the classroom.

Findings

My PhD research found that young 10- and 11-year-old designers demonstrated and drew on the operational, cultural and critical dimensions of their literacies as they designed and played ARGs with and for their peers. These three dimensions of literacies could be mapped onto their three key authorial concerns: fictionality, agency and authenticity. When creating an ARG the designers shaped the fictionality of the game, and in doing so they demonstrated the operational dimensions of their literacies when distributing narratives across modes and media. They also considered how to manage the agency and power of players and in this process drew on the critical dimensions of their literacies when designing and managing rule systems. As they selected the modes and media needed to communicate messages and shape meanings, they drew on the cultural dimensions of their literacies, considering what the players would consider authentic and believable within the context of play. Intersecting these three themes were concerns relating to constructing coherence, directing action and managing modality during transmedia play. The relationship between these key authorial concerns is presented in the model of ludic authorship (Fig. 3) shown below:

Figure 3: A model of ludic authorship: key authorial concerns, and associated literacies, demonstrated during ARG authorship (Colvert, 2015)

When 'managing modality' the designers were concerned with shaping the 'believability' of the game and drew on their understanding of the genre conventions of fantasy, and of the affordances of modes and media, when communicating with players. During play, the designers shaped the modality cues in a dialogue with the players and negotiated the truth claims made by the texts in order to perpetuate play. When 'constructing coherence' the designers were concerned with supporting and guiding players' interpretations of the narrative. During play, designers and players shaped the fiction (and meanings) collaboratively. When 'directing action' during play the designers prompted and encouraged the players to act in order to complete the quest successfully. The designers rewarded player actions by revealing more information and making new

acts possible, and they negotiated the significance of actions proposed by players. In my current research I am investigating the efficacy of this model of ludic authorship, in new primary-school contexts, with younger children. In the ARG projects I have undertaken with trainee teachers, I have observed them addressing and engaging with these authorial concerns and, in doing so, demonstrating all three dimensions of their literacies. When 'directing actions' and 'constructing coherence' with young children in these projects, these trainee teachers provided a range of opportunities for the young players to communicate their understandings and contribute to the games' narrative and rule structures; these included designing, producing and distributing short films, photos, written comments or audio files. During these projects, children and teachers also drew on their understandings of the conventions of play when 'managing modality' in order that the truth claims, and the reality status, of the ARG were presented and negotiated effectively. Further work does, however, need to be undertaken to understand the playful interactions between teachers and children during ARG design, and the pedagogical conditions which support them. Central to these interactions is the way in which an effective feedback loop between players (class of children) and designers (teachers) is established, both online and offline, within the fictional frame of the game and outside it.

Having supported trainee teachers in creating ARGs, I am now contacting them again to investigate the extent to which they have engaged in transmedia play in their first few years of teaching. Through interviewing alumni who participated in the ARG design course, I hope to identify the factors that influence a teacher's willingness and ability to engage in ARG design. I sent out a pilot survey to a class of 24 trainee teachers who undertook ARG design at the University of Roehampton in 2013 and have received ten responses to date: two respondents had not taught since leaving Roehampton, two were in their first year of teaching, two were in their second year and four were in their third year of teaching. The year groups taught by this sample spanned the complete age range from nursery (three years) to the end of primary schooling (11 years). Ten out of ten respondents had enjoyed the ARG design module and seven out of ten felt the module had influenced their teaching practice: two had designed and played ARGs with their classes and five had used elements of ARG design. Eight out of ten respondents would like to design an ARG with their class in the future. Of the three out of ten who felt that the ARG design course had not influenced their practice, two were not teaching. Perceived challenges to designing and playing ARGs in school, noted in the survey, included: curricular time, resources, teacher knowledge and ideas, professional control and power, perceived value of the approach, accessibility, budgets and child protection. In the coming months I will interview the teachers who responded to investigate their experiences and views further. After analysing the themes that

emerge from the interviews I will then broaden my study to include more teachers who took part in the ARG design course.

Conclusion

The model of ludic authorship presented in this paper (Fig. 3) not only reframes literacies, it also reframes play as a literacy practice which has cultural, operational and critical dimensions. Wohlwend argues that we should 'redefine play as a literacy, a key component of 'new basics' (Dyson 2006) […] in 21st century literacies' (2011:127) and suggests that this might go some way to 'empowering teachers to reclaim curricular space in their classrooms' (2011: 127). I agree and argue that a 3D approach to conceptualising play as literacy, as presented in this paper, might also go some way towards supporting teachers to plan opportunities for play in their classrooms and also articulate the rationale for such a move. Some pedagogical challenges do, however, remain in relation to the way policies shape practice in UK classrooms, which may prevent an easy uptake of ARG authorship and transmedia play in formal educational settings. It is these challenges that my current research seeks to explore.

For more information about alternate reality gaming in education, or indeed to play some sample challenges from The Mighty Fizz Chilla ARG, The Stolen Salt Cellar *ARG* or The Mission to Marzipan ARG, please visit www.argle.net.

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What happens when multimodality comes into the classroom? A study of Swedish children's use of multiple modes while creating narrative text

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Abstract

The aim of this study is to analyse and describe the impact of digital devices with a multimodal character on children's creations of narrative texts. The focus will be on the process of creating texts, the conditions for creating texts and the results, the texts. Text is seen as multimodal and the theoretical approach is social semiotics. The method will involve a multimodal didactic design approach. Data sources will include observations, interviews and text analysis. The analyses will comprise content analysis, writing discourse analysis and multimodal text analysis. The study is still in progress so some expected outcomes are presented in the text.

Keywords: Digital devices, multimodality, narrative texts, semiotic resources, writing

Introduction

Our terms of communication have changed with the digitization of society. With the availability of multiple ways to communicate, the ways in which we express ourselves have increased. These different means of communication also mean that we use more sign systems and semiotic resources for communication than we have ever done before. With digital tools, we have smooth access to different semiotic resources in the same unit, via tablets, computers and smartphones. When using different semiotic resources, e.g. letters, in a systematic way, it becomes a mode. A mode is a socially and culturally shaped resource used to create meaning. Pictures, writing, layout, speech, movement and images are examples of different modes (Björkvall, 2009; Kress, 2010). Many children learn to read and write at an early age with the help of digital tools, which have a multimodal character. Children switch easily between different modes based on their interests and what is available in their situation. How these abilities are utilized still varies considerably in Swedish schools. The impact of digital tools in schools, considering the process of creating narrative texts and how children

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use different modes to make and represent meaning, is an area that is yet to be explored in depth. The focus in this study is on children's writing process, the conditions for writing and narrative texts. The overall research question concerns what impact digital tools with a multimodal character have on students' creation of narrative text. This will be studied at various levels in two studies. The first focuses on seeing differences in handwriting and writing with digital tools and the other on text creation with digital tools, which include multiple modes such as verbal text, sound, video and images. The second study is based on and developed from some of the experiments in the first study. An example of this is that, in the first study, teachers chose to decide that children should be using only writing and sound (speech synthesizer) while creating narrative texts. As my interest lies in analysing how children use different modes and what work the different modes do in texts, I, together with the teachers, developed a design for writing that includes images, sound, writing and video. This became the condition for the second study. It will also be the same children creating narrative texts in the two studies. In the proposed study, I will examine how the writing process is shaped by children's use of various resources and how they present their narratives on the basis of given resources in particular situations. A design-oriented multimodal approach will be used, based on theoretical perspectives: social semiotics (Kress & Hodge, 1998; Kress, 2010), and a multilayered view of language (Ivanič, 2004,

2012). The methodological tools focus on a broader concept of text and give the opportunity to understand learning and representation by going beyond written and spoken verbal language. Other modes, such as images, sound or video, are seen as part of children's' ability to create meaning and express themselves and thus included in the analysis. The method will use a multimodal didactic design approach. Several data collection methods will be used: text analysis, qualitative interviews, observations and a survey. The study is still in progress so rather than results I will present some expected outcomes.

Theoretical framework

The social semiotic perspective will be used as a theoretical overall framework. In addition to that, other more local theories will be used in order to analyse the empirical data. The multidimensional theory of language, developed by Ivanic (2004, 2012) has some basic assumptions in common with the social semiotic theory. That is, texts are multimodal and their form and content have equal importance, forming a whole together. The creation of texts happens through interaction with others and should be seen in a social context. Together, these theories give me the tools and ability to analyze and describe the impact of digital tools with a multimodal character on children's' creation of narrative text. Ivanič's theory complements social semiotic theory, offering an opportunity to analyze empirical material comprising students' writing and their text production

in terms of both form and content. To understand the whole complex process of something, West (2007) explains that it may be necessary to have a multi-dimensional theoretical framework in which each part is first analysed, and then the whole is considered.

Social semiotics

The basic assumption of a social semiotic perspective is that everything created is made through social creation with others and/or for others. Explanations for why our communication is as it is can be retrieved from the social context we find ourselves in (Björkvall, 2009; Kress, 2010). Another assumption is that meaning is created using character-building in several different sign systems. Representation and communication are social practices whereby representation focuses its interest on and involvement in how we understand and form meanings of things and events in the world. It has to do with how we materialize our view of the world as we perceive it. Communication is more the desire we have to share this representation with others (Kress, 2010). This perspective also provides tools to analyse how we, with our different ways of communicating, participate in the creation of the social world; it can simultaneously be described as a communication theory, a theory of representation and meaning and a social theory (Hodge & Kress, 1988). Texts are regarded as multimodal, created with multiple modes such as there is no news; however; texts are multimodal, they have

been written with accompanying illustrations for a long time. But the concept of multimodal text is new and was first used when it became easier to produce composite texts consisting of writing, pictures, sound and video. Multimodal texts are texts that are composed using several different semiotic resources. A semiotic resource is material which can be used for communication (Danielsson & Selander, 2015). There is also a meaningful relationship between the text parts. When semiotic resources are used in a systematic manner they can be called semiotic modes. Two of the most well-developed modes when it comes to communicating are writing and speech. They are important for children if they are to learn and develop, but considering the media-based environment that children are a natural part of, they are not sufficient. Images, sound, animations and other modes that play important roles in children's everyday meaning-making should also be common modes in the education environment. It is also important to take into consideration that each mode has its limitations and opportunities, meaning that images do what they do and writing do what it does, and in combination they can do a different thing (Björkvall, 2009; Kress et al, 2008).

Here one can think of the possibilities and limitations of the various semiotic resources to create the meaning one wants to express. One can explain the choices made in a multimodal text, discuss why these choices have been made, how these choices relate to the social context and what information value the different semiotic

modalities have. An ethical aspect of this, according to Kress (2010) and Björkvall (2009), is that one can also say something about a text's availability and the right of children to create meaning and express themselves using different sign systems according to their interests and abilities.

A multilayered view of language

Based on the theory and assumption that language and writing are done in layers that are interdependent and of equal importance, Ivanič (2004, 2012) has developed an analytical model for six different writing discourse attributes that can be helpful to understand the writing process, both by seeing how and what an individual writes, as well as having an opportunity to understand what children do when creating text. She explains writing on the basis of these writing discourses: discourse skill, creativity in discourse, the discourse process, genre discourse, the discourse of social practices and finally socio-political discourse. All these discourse elements are to be seen as building blocks in writing and should include the writer's teaching, according to the author.

Methodology

In a multimodal approach, this study design is based on several different technologies from a multimodal perspective. The study is intended to capture children's' writing processes as well as representations in the form of narrative text created in different sign systems. The multimodal perspective will also be visible in parts of the analysis. This combination of methods will generate different types of data. A short presentation of the two studies and the methods which are to be used is given in the following.

Study 1

An intervention involving digital devices which means changed conditions for creating texts. I had access to a class where before they had only used paper and pen when creating narrative texts. The data collection was done in two steps, using the same methods, before and after the intervention of digital devices (tablets). The data-collection methods were: observations to see what is going on during writing activities; interviews with 17 children to study the writing process – listening to children's thoughts about how they find it easiest to write and what impact digital devices have on their text creations; narrative texts, created with both pen and paper and tablets by the same children. The aim here was to see if the texts change with respect to content and form.

To analyse this material, different methods will be used: the discourse analysis of Ivanič (2004) and content text analyses. The teacher of this class decided that the children could only use writing and sound on the tablets. Given this proviso and considering my interest in creating multimodal texts relying on the children's interests and abilities, there was a need to develop other conditions for creating

narrative texts. Study two was designed by me and the class teacher in order to be able to study how children create texts using different modes.

Study 2

Using multimodal analysis, the purpose of this study is to examine and understand children's' creation of multimodal stories with sound, images, video and text. Such texts are created by children in informal settings and such texts take on more of the character of design. According to Kress and Van Leeuven (2001), technology allows the integration of many different modes, such as text, images, video, voice, music and sound effects, causing text to look more like a design. Danielsson and Selander (2014) describe the tradition found in Swedish schools in lower grades where it is common for children to receive instruction in how to combine text and images, usually pictures carry the main message here. Verbal text acts as an accompaniment to the pictures. Later, as children get older, the focus shifts and pictures become more of a clarification of verbal text that children have produced. Access to digital media in schools provides children with the opportunity to do more, to be able to create their own multimodal books, when writing is replaced by composing texts.

The focus in this study will be to examine which semiotic modes children use, and what work the different modes do in their texts. There will also be a focus on the text-creating process, as in the first study. This study will be conducted on the same class as Study 1, although a year later. When study is carried out, the class will design stories using an app (application) that is designed to do 'multimodal books.' Children will become familiar with the opportunities available within the app by practising beforehand. It is important that the children are aware of the different opportunities within the app. The instructions from the teacher will be to create a narrative text using the modes they prefer. The children will then be free to write or 'design' their own stories. The data collected will comprise the students' finished narrative texts along with observations.

It is to this study that I think that the multimodal analysis contributes most. I think that the analysis model that Danielsson and Selander (2014) developed can be considered in this study. The headers used in multimodal analysis then become:

Conditions for writing: what can be explained is the teacher's design of text-creation events, what resources are available in the text-creating situation.

Overall structure and staging: an analysis of how children design their work. An analysis of structure can be performed and the semiotic resources used and themes covered.

Selection of semiotic modes: how children use different modes can be analyzed, and what the different modes do in the narrative can be explained.

Interaction between text parts: an

explanation of text parts can be given, what is foregrounded and what is backgrounded. Do the different modes complement each other or do children mostly use example images.

These parts will first be analyzed individually and then together in order to understand whole texts and the process of creating them.

Some preliminary results and expected outcomes

As this study is still in progress there are no actual results to present, but it is pertinent to write about preliminary results and expected outcomes. Some previous outcomes indicate that the impact of using digital devices differs greatly among children. To be able to add a speech-synthesiser as you write seems to be very helpful for children who need a lot of support from the teacher with their spelling and for children that have Swedish as a second language.

For students who find it easy to write there was apparently no significant difference if they wrote by hand or on tablet. Most of these students wrote shorter texts using digital devices. These students found it most disturbing with the speech synthesis.

The greatest differences were seen among pupils with Swedish as a second language as well as among students with Swedish as their first language that had difficulties with keeping the structure of the text. These differences were seen in the ability to spell and in the length of texts.

Regarding students who showed better results when they wrote digitally, it seems that it was the speech synthesis function that was crucial.

Taking into account the preliminary results concerning the length and the spelling in the texts, next step is to analyse if it is possible to see any differences in text structure and how the students uses the language when writing in different conditions.

Others seem to be annoyed by sound, and so they do not use it. The writing process will change when using digital devices with a multimodal character. Some preliminary results indicate that when students write by hand it becomes an individual process whereas when writing with digital devices, the process becomes more a process in interaction. Another result indicates that when students' texts were influenced by others, they became similar. If children are allowed to use all the modes in the unit, they can design text in a different way from those created using pen and a paper; it will be more like a design process. This will also vary among the children according to their interests and abilities. Narrative texts do change when children use digital devices, in both form and content.

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Language socialization, digital technology and new multimodal practices in early childhood in middle-class families in Madrid

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Abstract

In this paper I present the research design and fieldwork plan for my doctoral dissertation project. The project, in overall terms, seeks to obtain a deeper understanding of the routines and forms of socialization of families with young children in urban areas in Madrid. Among other fundamental issues, I seek to examine how digital technologies are included in family dynamics and forms of engagement, in response to their social circumstances, the families' ideologies around childhood and education or the influence and pedagogical intentions of nursery school when such a context is present in the organization of family life (all these aspects are in some way tied to the meaning of digital technologies in children's and parents' lives, as mentioned by Sefton-Green et al. (2015)). The proposal was presented at the first Digilitey Training School in order to obtain some feedback and refine the research design and fieldwork plan of the project.

Introduction: Empirical background and status of the current issue

The study of childhood has seen renewed interest as an area of social research in recent decades as a result of the changes that have taken place in post-industrial societies (Corsaro, 2005; Frønes, 2005; James & James, 2004). Factors such as the diversification of family models and organization structures, the introduction of different educational projects in schools or the presence and use of new technologies by increasingly younger children (Marsh et al., 2015) have opened up the possible existence of different paths of socialization in childhood and prompted a reinterpretation of the aspects that make up its construction and its role in society.

In the context noted above, there is a need

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to explore the changes affecting the organization of childhood through children's daily routines and activities. In this area, there are many empirical studies that focus on specific activities, but as Ben-Arieh and Ofir (2002) point out in their review of literature on this topic, there are few studies that consider all the activities that make up children's daily lives. This lack of research is especially noticeable in preschool children segments, especially children under three years of age. These authors call for further studies to examine the full scope of the daily activities of this age group, using "larger samples of children" (p. 239) and quantitative techniques. I think, however, that there is also a critical need for studies using other research methods which are more sensitive to children's daily routines and cultural aspects that influence their development (Weisner, 1996). In this sense, the introduction of an ethnographic perspective will make it possible to explore the range of social scenarios in which young children participate by including the meanings and actions of the participants involved and integrating, into the analysis, among other fundamental issues, the role that digital technology plays as one of the contextual factors that affect the configuration of these scenarios and children's experiences. As some authors have argued, the incorporation of digital technology into children's routines is reconfiguring the ways they produce and maintain their interactions with the settings, actors and everyday things present in their lives, e.g. allowing interaction with friends or family relatives or the realization of other recreational activities from the privacy of their home, instead of having to perform them in places like parks or other public spaces (Morgade, Poveda & González-Patiño, 2014). This kind of evidence is drawing attention to the importance and implications of digital technology when it comes to conceptualizing and reconfiguring the notion of "context" in relation to children's active engagement in their daily activities, and it is also challenging the methodological approaches to these new forms of interaction (Plowman, 2015). I think that it would be interesting to examine these issues with families with children between 0 and 3 years old, since research about digital engagement with media and digital technologies for this age group is still scarce (Marsh et al., 2015).

In this text I present a proposal for a project that aims to examine in depth the living conditions and forms of socialization of young middle-class families in the Spanish context, in which digital technology is integrated as an essential part of the object of study and analysis. By presenting this work plan and participating in the Digilitey Training School, it was hoped to obtain feedback on the research design and fieldwork plan, and to discuss issues that could be relevant to further development of the study and analysis.

Aims

The project, in overall terms, seeks to obtain a deeper understanding of the routines and forms of socialization of

families with young children in urban areas in Madrid. This can be broken down into the following specific objectives:

1.Explore the diversity of routines, scenarios and paths of socialization that shape the daily lives of young children, and the changes experienced in the organization of their family life. Regarding this scenarios, it is intended to explore the evolution of such aspects as: the organization of attention between children and caretakers; the "micro-habitats" and "macro-habitats" (Ochs, Solomon & Sterponi, 2005) that configure their activities; frames of participation (de Leon, 2012); how some semiotic artefacts are incorporated, including books, and especially digital technologies, and exploring how they affect the forms of communication and interaction established between children and their caregivers (Sefton-Green et al., 2016).

2.Explore the factors involved in the participation of children in the settings and routines identified and how such routines are managed – this includes exploring how these factors affect the ways in which communication is organized. This requires such analyzing aspects as the ideologies and decisions of parents and other caretakers, or institutional practices in scenarios like nursery school.

3.Compare routines, ideologies, practices and ways of organizing communication among (a) children attending kindergarten and those who

stay at home, and (b) structurally distinct families.

Theoretical framework

This project takes on board the theoretical and methodological approaches of linguistic ethnography (Copland & Creese, 2015), language socialization (Duranti & Ochs Schieffelin, 2012) and the ethnographic microanalysis of interaction (Erickson, 1992). These approaches share two fundamental assumptions about social interaction. On the one hand, they favour interactional and communicative aspects when it comes to conceptualizing and analyzing the actions/ activities in which individuals take part. On the other hand, both approaches conceive communication as a process of meaning creation by subjects and situated "in context", including institutional and sociocultural aspects. In order to "capture" these meanings and contextual aspects that make up communicative events, they make use of ethnographic methods of analysis and the collection/ production of data.

These theoretical approaches are compatible with other frameworks that allow the incorporation of digital technology into the analysis of situations of interaction between children and their caregivers, such as Goodwin's (2007) proposal for interactive organization communication, and other proposals for multimodal analysis (e.g. Jewitt, 2013). From these models, digital technology can be understood as one of the elements of "contextual settings"

(Goodwin, 2007, p. 60), in which individuals jointly build action, alongside other modes of communication such as language, gestures or body posture or position. As Jewitt (2013) points out, "digital technologies are of particular interest [...] because they make a wide range of modes available, often in new inter-semiotic relationships with one another, and unsettle and re-make genres, in ways that reshapes practices and interaction" (p. 2). Multimodal interactions around digital technology have been analyzed to explore changes in the forms of literacy in specific contexts such as school and family (e.g. Wolfe & Flewitt, 2010), but this multimodal analysis of interaction around digital technology with "pre-literate" children is still scarce.

Methodology

In order to identify and analyze the evolution of the routines and scenarios that make up children's daily lives – drawing attention to the role played by digital technology in the organization of communicative encounters and the configuration of activities between children and their caretakers – a longitudinal study will be conducted with families with children aged 6 to 24 months old (although the final ages may vary in order to explore their routines beginning in earlier stages of life). The sample will consist of four families, two in which the focal child is attending preschool and two in which the beginning of their incorporation into formal education is postponed. This will allow exploring, among other issues, how digital technologies are included in family dynamics and forms of engagement, in response to social circumstances, families' ideologies around childhood and education, and the influence and pedagogical intentions of nursery school when such a context is present in the organization of family life. Families and children from the middle class and living in metropolitan areas in Madrid will be sought.

As noted above, this project draws on ethnographic and interpretative approaches to human interaction and communication. In order to examine the interactional events that occur between children and their caretakers, we will use video recordings as the primary technique for the collection/ production of data. This will allow us to construct a fine-grained record and systematically explore the resources and practices through which young children and their caretakers construct their interactions and activities, examining the ways in which their talk, gaze, gestures, body position etc. elaborate each other. Part of the analysis will focus on exploring the interactions and combination of resources around digital technologies. We will also employ other procedures for data collection in order to contextualize and get a deeper understanding of these issues; these procedures include participant observation, field notes, interviews and the collection of documentary material.

The main body of the data will be generated by tracking an entire day of the focal children who take part in the study (either in school or inside/ outside the

home). The documentation – by video records – of children's activities across an entire day was originally developed in a previous research project, 'Day in the Life', as result of an interest in developing a reflexive methodological apparatus to allow us to reflect on cultural constructions, values and experiences regarding children's care and opportunities for development, and this was used one day with two-year-old children to reflect on these issues in diverse cultural contexts (Gillen et. al, 2007; Hancock & Gillen, 2007). In the research plan presented in this communication, we will follow children's entire daily routines every month (this means a total of 18 major moments while collecting data during a total of 18 months' fieldwork). The researchers will monitor children's routines and interactions with their caretakers, making combined use of some data collection tools as follows. The first day of the visit will be dedicated to participant observation and taking field notes which, methodologically, will allow to identify key events for subsequent recording and make some decisions regarding their production if needed (although we will follow the recommendations formulated by Erickson (1992)). The second visit will be devoted to making further video recordings, and in subsequent sessions we will continue by alternating between participant observation, taking field notes (odd sessions) and video-recording (even sessions). This combination will be utilised in order to refine the data collection (specifically, video recordings), which will be supported by constant cycles of their analysis. The ethical aspects of the participation of children and their caregivers will be handled carefully (Flewitt, 2005).

The analysis of the data collected will be done by following two approaches: (1) a general examination of qualitative data, and (2) a specific examination of the interactions that occur between children and their caregivers in the course of their daily activities.

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'Turkish children' and media in Germany: A culturally sensitive study of media-use practices in early education

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Abstract

Children from immigrant families and a non-academic environment find themselves disadvantaged even before entering school (Baumert et al., 2001; Valtin, 2008; Neumann & Schneider, 2011; Ramsauer, 2011). Within the migrant community in Germany, both 'Turkish pupils' and pupils from ex-recruitment countries have significantly lower education-participation rates (Bundesministerium für Bildung und Forschung, 2012, pp.7, 40; Diefenbach, 2010). These affect and strongly influence their development throughout their education, starting in kindergarten. In fact, educational institutions do not succeed in compensating for these educational deficits. These results can also found in the development of media literacy (Six & Gimmler, 2007; Marci-Boehncke & Rath, 2013). In order to reduce unequal conditions and educational opportunities, including in the context of media education, it is important to research children's living and media environment vis-à-vis their culture-specific media use in early education (Marci-Boehncke & Rath, 2014).

Introduction

Since the publication of the first PISA studies in 2001 (Baumert et al., 2001), the aspects of educational inequality and fairness of chances have been discussed more intensively by the society with regard to education policies in Germany. The code number 100-77-23 refers to the topic equality of opportunity in Germany. This is often associated with unequal conditions and opportunities (Maurer, 2015; WEST ART Talk, 2015). In fact, the code makes the constitution of opportunities visible and equality appears as an illusion, as Bourdieu and Passeron (1971) mentioned with regard to the education system in France.

Looking at international comparative studies, it can be pointed out that

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educational opportunities in Germany are determined by the phenomenon of migration and one's social background (Neumann & Schneider, 2011; Ramsauer, 2011). The risk of failing for boys and girls with an immigrant background is higher than those without in the education system in Germany (Bundesministerium für Bildung und Forschung, 2008, 11f., 70, 90; Segeritz et al., 2010; Siegert & Roth, 2013). The risk of repeating a school year in primary school is four times higher for children with an immigrant background (Bellenberg, 2005, 3f.).

The results of a German study about computer and information-related competences of pupils the 8th grade in an international comparison (called ICILS) show that there is indeed a significantly higher percentage of pupils with an immigrant background who have a lower level in computer and information-related competences. For instance, it has been detected that almost every tenth teenager with an immigrant background only acquires very simple skills in using digital media in a competent way (which is competence level number one). More than 40 per cent of these pupils do not reach competence level number two (Eickelmann et al., 2013, p.323). Certainly, to define unequal educational opportunities, it is not enough to focus on immigrant background as the central characteristic of inequality. Nevertheless, in the opinion of Rauschenbach (2013), without the characteristic of migration some social disparities cannot be explained (Rauschenbach 2013, p.10).

As a result, the focus has been put on early education in Germany. In no other era of social development have daycare facilities for children had such high importance in Germany as they have had in recent years (Diller et al., 2004, p.7 cit. a. Fried, 2013). In this sense, many questions concerning the education system have arisen, especially from the 2000s onwards (Fried & Roux, 2013, p.17). Childhood has been rediscovered as an independent stage of life (Baacke 1999, p.400). This stage in education is now recognized by society so that children's educational biography starts in kindergarten (Fried, 2010, p.935f).

There is a consensus that childhood can no longer be viewed without considering the influences of globalization, individualization and mediatization (Krotz, 2001; Neuß, 2013). These factors are also relevant in the living environment of children (Marci-Boehncke & Weise 2013). Media devices and content play an essential role in children's primary experiences. For this reason, children need to be accompanied and supported from the beginning – in familial as well as institutional contexts – by including in their living and media environment culture-specific media use in early education.

Until now there has been little empirical research in Germany and German-speaking countries. German studies of media use have collected data on teenagers, aged 12 to 19 (FIM Survey). They have also collected data on children aged 6 to 13 (KIM Survey), but not much in the field of early education (miniKIM Survey). And in

this work they do not even consider the cultural context or the context of the origin of culture (Marci-Boehncke & Rath ,2014). Consequently, children's living and media environments have not been researched with regard to their culture-specific use of media in Germany, and both educators and teachers have knowledge gaps concerning children's living and media environments regarding their culture-specific media use in early education. There is insufficient information for educators and teachers. This is because educators and teachers seem to be scarcely sensitized to multicultural media socialization (ibid.; Theunert, 2008; Goetz et al., 2015).

The research interest of this research paper is located exactly at this point: The author wants to make a contribution to the following aspects:

- Equal educational resources right from the beginning
- Improvements in starting conditions, also with regard to media education (especially to overcome sociocultural barriers)
- Recognizing cultural differences and heterogeneity with regard to the socialization of media
- Promoting and developing potential
- Establishment of (intercultural) media education within early education

In this context he is examining:

- Expectations of parents
- Pedagogical attitudes
- Educational action in families
- Evaluation of parents (also single parents) regarding children's media-use practices at home

- Evaluation of educators regarding children's media-use practices in kindergarten

Finally, the author wants to address the research question: What kinds of patterns of media use can be detected by preschoolers with and without a multicultural background (with a special focus on 'Turkish' and 'non-Turkish children') – referring to their culture of origin and mediatised social context. What kind of educational and social relevance does the topic have in connection with the education system in Germany?

In this context he is also interested in the following questions: What should a survey of early media education consider in order to pursue equal of educational resources and participation opportunities from the beginning, also to overcome sociocultural barriers? Moreover, how can a survey of early education, including media education, push against the effects of social inequality right from the start?

Theoretical framework

The research is part of KidSmart – Media competence in school transition, an intervention-based study in the field of early-media education (Marci-Boehncke & Rath 2013). The research draws on Bourdieu's theory of habitus and forms of capital (Bourdieu, 1983, 1986). The focus is on the habitus of media education of different agents which directly or indirectly socialize children and hence their participation and access to participation.

The concept of educational governance (Heimbach-Steins & Kruip 2011) is applied in order to distribute the responsibility broadly so that access to education is not dependent on a single agent. The process of media education is designed as a meta-cognitive process for students and teachers (Lai, 2011). The actual acquisition of competence is conceived from the principle of media apprenticeship as an interactive process for all participants. Children's media-usage habits are observed in a natural space by participant observation during the intervention (Krainer et al., 2012). In order to reduce unequal educational conditions, the institutions were located in socially disadvantaged areas in Dortmund. In this way, it was possible to connect with such institutions that needed support.

Methodology

The main goal of this research paper is to capture the media habits of four- to six-year-olds from a culture-sensitive perspective empirically both qualitatively and quantitatively (in order to connect with existing studies). Based on the principles of heuristic social studies, a complex triangulated research design (Flick 2004) was employed on the level of methods and data. The project models itself after Lewin's action research (Lück 1996). With a variety of methods, different perspectives were worked out and contextualized. Data were gathered with semi-standardized questionnaires, qualitative (puppet) interviews and observation. These data will be evaluated with grounded theory (Glaser & Strauss 1998; Strübing, 2004).

Results

About 70 per cent of children in the kindergartens of KidSmart have an immigrant background ('Turkish children' and 'other children'). The majority of them (29.9 %) are growing up in a 'Turkish' cultural context. Children with an 'Arabic' background should be mentioned too (14.3 %). Russian (6.8 %) and African children (5.5 %) also belong to larger groups. In contrast to this finding, the cultural background of the educators is primarily German (81.8 %). Less than one out of ten of them describe themselves as multicultural (9.7 %). More or less the same percentage (9.1 %) do not specify their identity. They prefer a plural affiliation or a hybrid identity (Bonz & Struve, 2006; Foroutan, 2013).

This cultural imbalance seems to influence the communication between children and educators with regard to children's media-use practices. Despite the good to very good German language skills of the children (evaluation by the educators) more than half (52.8 %) of educators do not discuss with 'Turkish children' their living and media environment. About ten per cent of the educators do not know anything about their medial use. In the 'non-Turkish' context, quite the opposite is the case: more than half (54.4 %) of educators do discuss 'non-Turkish children's' media-use practices. With 'Other children' ('non-Turkish children' and 'non-German children') the interaction

is the highest (55.1 %). This begs the question of the reasons for the weak interaction between the educators and, especially, 'Turkish children', as well as the repercussions of the weak knowledge about the media everyday life of these children. Moreover, the question 'What does this portend regarding educational opportunities, as well as in the context of media education?' arises.

Furthermore, evaluation of the quantitative data shows differences in the educational measures for media between 'Turkish families' and 'non-Turkish families'. In contrast to other parents, 'non-Turkish parents', especially 'German parents', seem not to leave the media education of their children to chance. About 60 per cent of 'German parents' and more than half of 'Other parents' look after the media education of their children. Limitations and prohibitions are often used as educational methods in these families. Opposed to this, just a third (35.6 %) of 'Turkish parents' give their children support in media-use practices at home. Prohibitions are the exception rather than the rule. Just under ten per cent of them prefer prohibiting the media use of their children. Talking about media seems not to be relevant in the 'Turkish' context. In addition to these results, it can be pointed out that in more than 30 per cent of 'Turkish families' laissez-faire behaviour is observable. This means that, in the 'Turkish context', nearly every third child is allowed to use any media whenever they feel like it. This should be a reason why, in 'Turkish families', higher media use is observable. Less than a fifth

(18.2 %) of 'Other parents' and just a tenth (10.6 %) of 'German parents' are relaxed vis-à-vis their children's media-use practices.

In the first place, 'German parents' want their children to learn critical-reflexive, selective, creative and sober usage of media. The critical-reflexive usage of media is only observed in rare cases in 'Turkish' households. According to about one in two 'Turkish parents' (49.1%), their children should be able to differentiate between useful and less useful offerings. The majority of 'Turkish parents' (52.6 %), as well as a majority of 'Other families' (62.9 %), tend to familiarize their children with content that could be helpful for school, presumably educational software in particular.

By looking at the media skills of children it seems that there are differences in the perceptions of parents and educators depending on sociocultural, familial and gender-related factors. With regard to these discriminatory factors, in the sense of "intersectionality" (Collins 1998) their interdependence is of interest in the context of educational policy (Goetz et al., 2015). In general, parents seem to evaluate increments in the media skills of their children less than educators do. 'German parents' seem to perceive fewer increments in the media skills of their children than educators do. 'Parents with an immigrant background' seem to uprate the media skills of their children more than 'German parents' do. Overall, parents seem to perceive more favourable changes by girls

rather than boys as regards media skills (the opposite of educators). 'German parents' foreground the progress of their daughters and 'parents with an immigrant background' the progress of their sons. Educators mostly seem to observe progress by 'German boys' (ibid., p.86f.).

The main objective of this research paper is not at first to contrast 'Turkish' and 'non-Turkish' living and media environments. Moreover, it is not to be understood as an evaluation of the stances of parents and educators relating to their view of early media education and the usage of media devices in general. Primarily, it is about representing, describing and shedding light on the living and media environments of children, especially of professionals, whilst taking into account their culture-specific, familial contexts with respect to multicultural media socialization. At the same time, the existing situation in the field of early education in the domain of cultural diversity should be figured out. Against the backdrop of this approach, unequal educational opportunities including in the context of media education should be reduced or even removed right from the beginning, especially to overcome sociocultural barriers.

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Children's play with digital media in a Danish pre-primary school: Media literacy between a play-cultural child perspective and a school-cultural adult perspective

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Abstract

Danish schools are obliged to work 'in a playful way' with digital media according to the demands in the descriptions of the curricula for pre-primary education (Undervisningsministeriet, 2015). Much money has been spent on digital infrastructure, but still professionals in pre-primary education say that they are short of time, experience and knowledge when it comes to actual implementation of new media in everyday school life. On the other hand, most children come from media-rich homes. This article addresses the gap between in and out of school from a child's perspective. The key concepts are play and media literacy, and the project's take on play is inspired by the paradigmatic change towards a participatory and child-oriented scientific position. The understanding of media literacy is narrowed down to a trichotomy that implies having access to media, understanding media and creating/ expressing oneself using media. A qualitative study within the sociocultural scientific field was carried out in order to gain a fuller understanding of a child's perspective of media literacy.

Keywords: Play, media literacy, participation, Spielraum, pre-primary education

Introduction

As I began my fieldwork February 2014, the professionals made it clear that technology, digital media and the like did not have first priority. On the other hand, pre-primary children from media-rich homes know about the 'Net', YouTube and Skype, use different devices, mainly for gaming, and are aware of specific apps, films and television. Recent research supports my findings (Chaudron, 2015; Johansen & Larsen, 2016). Certainly, children do have some skills, knowledge and know-how

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concerning digital media when they enter school. In other words, I have noticed a (digital) gap between 'in and out of school' that corresponds to a gap that is also theoretically addressed (Drotner & Erstad, 2012; Erstad & Amdam, 2013; Gee, 2010; Sefton-Green, 2012). The possible connections between children's play culture and media literacy need therefore to be investigated in order to rethink the pre-primary school setting. Much research and policymaking that deal with media literacy have focused on parents and professionals (Buckingham, 2003; Jenkins, 2009; Livingstone, 2009). We need to gain a fuller understanding of a perspective whereby children's play culture is investigated in order to make that perspective work in media education.

The central question of the article is: How can knowledge about children's play with digital media inform our understanding of media literacy and be part of a school's formal work with media literacy?

Theoretical framework

Play and media literacy are key concepts in my investigation. The project's take on play is inspired by the paradigmatic change towards a participatory and child-oriented scientific position. Play depends on participation (being in, being part of), activity (doing something) and skills (know-how), according to play studies (Karoff, 2013; Mouritsen, 1996; Sutton-Smith, 1997). Speaking of play in a school context it is very often understood as 'play as

progress' or 'play as learning' rhetoric (Sutton-Smith, 1997). If looked upon from a child's perspective, children do not play in order to learn (or educate/ develop) themselves, but they might need to learn something in order to master a special part of play (Mouritsen, 1996). Moreover, play is a framed activity that differs from 'not play' (Bateson, 1972).

There is a variety of understandings and definitions of media literacy (Erstad & Amdam, 2013), but it is often narrowed down to a trichotomy that implies having access to media, understanding media and creating/ expressing oneself using media (Carlsson, 2013; Erstad & Amdam, 2013; UNESCO, 2013). In order to find out how children's cultural play 'doings' and 'know-how' can inform media literacy, I have looked into three levels of both play and media literacy. Important dimensions are therefore: access, understanding and create/ express, but also participation, activity/ performance and skills. Access to media must be a precondition for participating in play with media. At the same time, children do something with media (act, perform, create, communicate) and demonstrate some skills while playing with media (understanding, levels of reflection). Though it seems that the understandings of media literacy and of play correspond, there is a need for further investigation.

Methodological framing

This article is based on long-term fieldwork

among children in two different schools. The children were all part of pre-primary education (5–6 years old). Approximately 120 children were involved, and a qualitative study was conducted by using participatory methods including fieldwork, participatory observations, interviews and interventions (Andrew Burn, 2014; Clark, Flewitt, Hammersley & Robb, 2014; Gulløv & Højlund, 2006; Marsh, 2012).

Practice theory frames the paper (Couldry, 2004; Reckwitz, 2002; Schatzki, 2001; Swidler, 2001), because the main focus is directed towards what children do when using digital media in various ways while being engaged in playful activities. It includes both discursive and interactive practices in play. The analytic strategies are based on grounded theory methods (Charmaz, 2014; Guvå & Hyllander, 2003).

Analysis and results

Grounded on my initial fieldwork's interest in 'what's going on' in school vis-à-vis children and digital media, I found that three defining levels of media literacy were addressed by practitioners. The access level was practised as regulation, and the youngest children most often had no access to digital media. The level of understanding was expressed as a concern, whether young children were able to 'see through the media'. Levels of creating and expressing were vaguely present. Since my issue concerns what is going on when children play with digital media in pre-primary classes, I have

focused on the playful 'interaction, creative and communicative' dimension of media literacy, and with children as central informants.

I want to demonstrate children's 'playful approach' to digital media with two interviews: One about the game Hayday (one of twenty 'short' interviews about 'digital media: two children outside during a break), another about inventing a game (one of three final 'in-depth' interviews: two children in a classroom).

The examples are situated as interviews, given how I ask some questions the children are supposed to answer. But, as we shall see, the interviews are indeed 'active' in the sense that all participants in them (and others) are implicated in meaning-making (Holstein & Gubrium, 1995). The interviews are semi-structured, but at the same time spontaneous. The situation hinges on the interaction between interview participants, and it processes and produces narratives structured by both experience and artfulness (Holstein & Gubrium, 1995, p. 18). It is framed as an interview, but artfulness, spontaneity and interaction reframe it as a playful event for children. Artfulness is interesting because it conveys or mediates children's media literacy in a way that involves play. Play is "fundamentally dependent on the children's participation and activity and is predicated on their acquisition of skills in terms of expressive forms, aesthetic techniques, forms of organization, mise en scène and performance" (Mouritsen, 2002, p. 23). In other words, the interview creates room for

play (Spielraum) and tells us something about children's media literacy. Both interview and play are situational and organized as social communities of cooperation by participants. The interview is framed by an adult researcher. In a grounded approach, the first and most important question is: 'What's going on?'. This is not play, and it is play. It is not an interview, and it is an interview. There is a double framing to take into consideration when analyzing the data. I will leave the methodological frame for a while and continue within the theoretical frame of play and media literacy.

A play analysis of a framed activity, interview about Hayday

The interview is conducted outside, during a break. Other children come and go and gather around the interview situation. Many comments are given from 'outside' children. The two interviewed girls have just told me they play Hayday on iPads. They say it is important to feed the animals:

Ego: *What happens if you don't?*

Girl: *Then ermm… . (a boy interrupts)*

Boy: *Me and N has tried not to feed an animal, then it died! (shouts)*

Ego: *Oh, what kind of game was that?*

B: *It was the world's greatest animal. (speaks slower and changes his voice)*

Ego: *Was it also in Hayday?*

Boy: *It was a rhino. (the intonation is dramatic)*

(03.43–4.05)

The two girls have agreed on their roles as informants. The situation is a framed activity (Bateson, 1972; Goffman, 1974). The positions are clear, I am the adult who is in charge of the situation, and they are children. Moreover, we have implicitly agreed on our roles in this specific situation. I ask the questions and they answer them (Goffman, 1959). We present ourselves, respectively, as interviewer and informants.

But then the boy breaks into a framed activity, a well-established interview. In order to succeed, and to become part of the situation, he needs to reframe it. He uses two basic principles of play, a formula (implicitly he makes it clear: this is play) and improvisation (make-believe, mise en scène, performance) (Mouritsen, 2002). He changes his voice to a dramatic intonation, speaks nonsense (there has never been a Rhino in Hayday, and the animals cannot die) and uses the symbolic and metaphorical power of language in order to convince the listener to listen to his story, and implicitly he reflects on the fact that 'this is play'. He uses the rhetoric of exaggeration, and 'the world's greatest animal' is suddenly the main figure in Hayday. We are convinced; he takes over the scene, and sets a new order. The dramatic and situational character of the interruption works to subvert the order of both the interview and the game. He knows the code of play, and since he is familiar with the game he knows how to improvise in order to become a participant of the interview situation, so he reframes it as play. He has play skills in term of expressions, aesthetic techniques, how to

perform and set the scene (Mouritsen, 2002).

The instant he 'enters', he crosses a threshold between in and out of the framed activity. Moreover, he subverts the order by turning the normativeness of Hayday upside down. Hayday is about keeping the animals alive, but he declares their death! He knows the formula of the game, and therefore he is able to transgress the formula of a beloved 'construction game' and turn it into a 'destruction game', and his skills are acknowledged/ applauded by the girls' giggling. Because of his game knowledge and his knowledge of the game's mechanics, he plays with norms and rules. He knows right from wrong and understands the morals of the game. He demonstrates that by parodying Hayday. His shift of intonation, use of nonsense and conscious change of animal categories signify levels of reflexivity and an ability to activate the play formula and improvise. His aesthetic skills (subverting language) evoke the Bakhtinian chronotope, the threshold (Bakhtin, 1981, p. 248). Time and place are important in the framing of the situation. It happens in a moment, time is here and now. Place is the schoolyard, on the stairs to the building with the classrooms, a physical threshold between in and out; and mentally the children are 'out' of school for a moment. The chronotope evokes both centripetal end centrifugal forces. All kinds of language and text are potentially involved in the dynamics of play culture, including media texts, of course, if they are useful. They are set in motion in activities, remixed and transformed for the purpose of play.

In other words, play is the main thing, it embeds digital media culture both as references and as possibilities for enriching interactions. The boy is well aware of the framed interview activity, and he knows what it takes to reframe it. The interview is artfully interrupted, and the interviewer's role is subverted and replaced by the 'world's greatest animal'. It takes some force to replace adult power, but aesthetic techniques and implicit knowledge-sharing do the trick.

But what has this to do with media literacy? First, the level of understanding media seems quite advanced here. The boy uses his knowledge of the game Hayday to demonstrate the Batesonian meta-communcative paradox of play: this is about both animals dying and animals not dying. The theme of the 'play' (the lustful: 'then it died') differs 'from the practice' of the play which is to participate, keep it going, have fun, impress the audience, perform, create new games, experiment etc. Second, no moral panic is needed. He understands the levels of representation in both play and the game. Third, he obviously brings his play culture to school. His reservoir of knowledge, skills and actions is part of his practice in school as well as out of school.

In the other interview example, one of the questions was meant to inform the creating/ expressing dimension of media literacy: "What if you were supposed to invent a game, what would it be like, if it should be really good, in your opinion?" The

question was not answered by talking about it, but by showing/ acting out 'the game'.

One girl (A) was interviewed together with a boy (J). When I asked a question she immediately set up a scene with two chairs and a table and initiated the artful plot of a game she called 'Restaurant'. The boy (J) seated himself without being asked to do so. The set-up implicitly invited J to play the part of guest in the 'game'. A's action, the set-up of the chairs and a table, was followed by Jonas's reaction. A social community of co-operation (and communication) was established. Through chains of associations, A moved in and out of two dimensions, inventing the game and playing the game, and J co-operated and co-created.

The collective aspect of the communication was obvious. The children needed to co-operate with and without words in order to keep the 'game' going. They demonstrated a solid understanding of 'the game' by referring to levels, rewards, actions, conflicts, monsters and killing. Moreover, narrative aesthetic techniques were demonstrated, scenes set and performed. In this Spielraum, digital and physical rooms intervened and new ideas, modes, sounds and words came up. It was both an experimenting room and a room for innovation.

Results: What then is the gap about?

It seems that there is no gap between media literacy practices and play practices in an approach constructed from a child's

perspective. One practice is embedded in the other, and it seems learning is acted out.

My empirical data point to the importance of looking into contexts of play, self-expression and communication in order to understand the engagement of 'media practices' among children in pre-primary education. Moreover, the data suggest quite advanced skills, knowledge and know-how, and complex levels of reflexivity that are exchanged in 'knowledge-sharing communities' and involve both play and learning (Jenkins, 2006). Creating 'Spielraum' (Ackerberg, 2013) seems to be important, and there is a double understanding of the word. It is literally understood as room for play, both physically and temporally in school, and metaphorically as elbow room or room for manoeuvre, in order to mentally create room for playful ways with digital media. The concept of 'Spielraum' needs to be elaborated as a key to transformation, remixing, co-operation, co-creation, innovation etc.

Both empirical examples demonstrate levels of spontaneous creativity and innovation, but also levels of 'understanding media', room for meaning-making and learning, and the potential for developing competencies.

Media literacy is already embedded in children's digital play practices. In other words, media literacy is 'out of school' as a part of children's non-formal play practices. But it does not seem as if children's digital play practices are embedded in a schooled

understanding of media literacy. How to embed play in a more formal understanding of media literacy involves more knowledge about what 'playful' means from the perspective of children.

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Creative and playful learning with Biophilia in preschool, after-school classes and primary schools in Iceland

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Abstract

In this research the activities of students and teachers participating in the *Biophilia Educational Program* in schools in Reykjavík are studied. Empirical data were collected at Dalskóli within a preschool/primary school setting in the context of the national core curriculum guide and developing multimodal digital literacy within Icelandic schools and the global ecology of learning resources. The study is grounded in sociocultural theories of learning that stress children's active role in their development and participation in the adult world. It applies a theory of multimodal mediation to study the learning processes and learning outcomes of students. The results shed light on how digital literacy can develop in an interdisciplinary and playful learning context and on the potential of *Biophilia* as a learning resource.

Keywords: Biophilia, digital learning resources (DLR), digital literacy, creativity, peer learning and meaning-making

Introduction to Biophilia

The multidisciplinary multimedia project *Biophilia* (björk, 2016) was published in 2011 by the internationally known artist Björk Guðmundsdóttir, and it was received as the birth of a new music format (Dibben, 2013), being the world's first app album (Webby Awards, 2012). It consists of ten songs and apps with which children can interact. It defies traditional definitions, as it sits amidst various phenomena: app, album, song, music video, instrument, video game and even academic writing (Korsgaard, 2013). All the apps have a similar structure, having a menu with five selections: "Play", "Animation", "Score", "Lyrics" and "Credits". Each app is accompanied by a musicological essay and the in-app experiences explore the relationship between musical structures and natural phenomena through new technologies. The topics range from a micro-world of viruses and symbiotic relationships (biology) to a macro-world of cosmology and Big Bang theory, with opportunities to explore elements in music,

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such as generative music, notation or arpeggios. Teaching guidelines offer suggestions for learning topics on music, nature, relevant sciences and human aspects for each of the ten songs (*Biophilia Educational Program*, 2016).

The precursors to *Biophilia* were the introduction of the iPad in 2010, Björk's fascination with touch-screen musical instruments and her desire to celebrate natural phenomena (Dibben, 2011). It has been stated that Biophilia's use of touch-pad devices activates the sense of touch in a way that ordinary music videos do not, as both the images and sounds of "music video" apps can be touched and altered (Korsgaard, 2013), allowing for a more tactile way of experiencing music and images. Dibben (2013) points out that the relationship between images and sound is a key point in the project's conception, relating directly to musical structures and processes, and that Björk's idea was to use touch screens as intuitive tools for music-making and as a means for interactive, educational experiences.

In offering *Biophilia* Björk was laying the foundations of a digital-learning resource (DLR) for children that would foster a creative, interdisciplinary approach in learning about nature, art, science and technology in an interdisciplinary fashion. She also invited all-inclusive participation by students. In an interview, Björk stated that her intentions for *Biophilia* were for it to be:

> *...an open, intuitive musical environment, where creativity is invited for the purpose of learning and personal development. Each child should be able to take home their own musical creations/ compositions.* (Víðsjá, 2011)

Biophilia was introduced by Björk on a world tour, with educational workshops for children through Web tutorials for the apps (Snibbe, 2012), some presented by Björk herself on YouTube. The *Biophilia Educational Program (2015) was established through an interagency collaboration (Warmington et al., 2004), like the one set up between the University of Iceland, the City of Reykjavík and Björk. Pedagogical ideas were co-developed by scientists and teachers in Iceland and those participating in the world tour and are available at the project's website and forum. Through the site, teachers can participate, collaborate and contribute ideas about learning. It has been suggested that Björk, by embracing the Web and its democratic nature, has changed the way fans and Internet users experience music (Webby Awards, 2012). It is suggested here that Björk also created a bridge, from music to education and learners, by gathering teachers' experiences from *Biophilia* residencies and encouraging the creation of a programme for learning about nature, art, science and technology (björk volumen, 2014). *Biophilia* has a broad scope with a variety of resources, perspectives and levels of complexity. Its implementation was supported by the Nordic Council of Ministers and carried out in all the Scandinavian countries during 2014–2016. The data collected in this research provide a rich source for exploring many different aspects of education with *Biophilia*, such as

children's understanding of nature and natural phenomena, teachers' collaboration and communities of practice, interaction in the classroom, peer-learning, interdisciplinary learning, playful and game-based learning, learning through the arts, mobile and connected learning, digital literacy and creative meaning-making. A discussion of these aspects of *Biophilia* is beyond this short article. Here, the aim is to present the first results concerning perceived digital literacy, playful learning and creative practices observed in students' meaning-making while studying with Biophilia.

Background and theoretical framework

The scientific term *biophilia* refers to research that suggests an instinctive biological bond between humans and other living systems (Kellert, 1996; Wilson, 1984). The title gives Björk's *Biophilia* an entrance level that, coupled with her activism to protect Icelandic nature (Náttúra campaign) and the Icelandic nation's ownership of natural resources, can have relevance to critical education concerning our relationship with nature. It can therefore contribute to a curriculum that encourages reflection and critical discussions in learning across disciplines.

The Icelandic core curriculum guide invites such an approach. It rests on six fundamental pillars: *literacy, sustainability, health and welfare, democracy and human rights, equality and creativity*. They are considered to be an intrinsic part of school activities of all curriculum guides developed at all school levels and are to be reflected and evident in all educational activities and in the content of school subjects (Ministry of Education, 2014). The fundamental pillars "are based on the idea that active democracy is unobtainable without literacy of the diverse symbolism and communication systems of society" and that democracy "can only flourish if simultaneously every form of equality between individuals and groups is supported" (2014, p. 15). The main objective of literacy is for students to become "active participants in transforming and rewriting the world by creating their own meaning and responding in a personal and creative manner to what they read with the aid of the media and technology that is available" (2014, p. 17). The core curriculum refers to media literacy and digital literacy as: "knowledge that people have to acquire to be able to use computer and web technology for various forms of communication and creation of material. It involves photographs, printed text as well as music, and relates to the whole spectrum of material management, that is, resources, processing and communication" (2014, p. 17).

The Icelandic core curriculum guide reflects, to a degree, evolving ideas on multimodal literacy, creates a context for teachers who wish to use new mobile technologies and encourages students' exploration with digital media. This shows the need to look beyond language in a rapidly changing social and technical landscape.

The multimodal facilities of digital technologies enable images, sound and movement to enter learning in new and significant ways. Locating *Biophilia* in the educational landscape can be useful in this context. Applying Kirriemuir & McFarlane's reference frame on learning theories (2004), *Biophilia* can be positioned on the humanist, social and situational side of its spectrum (see Table 1).

Biophilia invites pedagogies that emphasise the personalization of learning. It suggests working with students' experiences and feelings and using teaching methods that promote their creativity and agency. It also encourages peer-learning.

Theories such as Kress and Jewitt's theory of multimodal mediation (Jewitt & Kress, 2003) are useful for analyzing digital literacy, the different modes of multimodality and different sides to the interpretation of meaning (Jewitt, 2009). Multimodality is defined as "the use of several semiotic modes in the design of a semiotic product

Table 1: Kirriemuir and McFarlane's reference frame on learning theories (2004), adapted from Smith (1999).

Aspect	Behaviourist	Cognitivist	Humanist	Social and situational
View of the learning process	Changes behaviour	Process entirely in the head of the learner (including insight, information, processing, memory, perception	A development of personal potential	Interaction/ observation in a group context, akin to an apprenticeship
Site of learning	External resources and task are what matters	Making connections in learner's head is what really matters	Emotion, attitude and thinking are important	Learning needs a relationship between people and environment
Purpose in education	Produce behavioural change in desired direction	Develop capacity and skills to learn better	Become self-reliant, autonomous	Full participation in communities of practice, i.e. you graduate from apprentice to craftsman

or event" (Kress and Van Leeuwen as cited in Jewitt, 2009, p. 1). Mode is used to refer to a "regularized organized set of resources for meaning-making, including, image, gaze, gesture, movement, music, speech and sound-effect" (Jewitt & Kress, 2003, p. 1). Other instances of commonly used modes are writing, the moving image, 3D models, action and colour. Mode is meaningful and a socially and culturally shaped resource (Kress, 2010). Modes are shaped by both the intrinsic characteristics and potentialities of the medium and by the requirements, histories and values of societies and their cultures (Kress & Leeuwen, 1996). The medium is the substance through which meaning is realized and mediated to others. Every mode also has a different modal resource, which is historically and culturally situated. Context shapes the resources available for making meaning, as well as how these are selected and designed (Jewitt, 2013). Modes are often used together in modal assemblages, like in films (Kress, 2010). These assemblages are based on design, selections or arrangements of semiotic resources which convey the message, meaning or signs that the designer chooses to deliver. Production is the implementation of design with the resources available; it has, simultaneously, semiotic, conceptual and affective features. The agency of the sign maker impacts on knowledge production, which is a part of social semiotic processes and the organization of participation. Kress emphasizes that knowledge is always produced, rather than acquired. This is of central importance for

multimodal learning. Assuming that all modes are equal for creating meaning, rather than starting from language, is another important aspect to be considered. In Before writing (1997), Kress describes young children's engagement with texts and how they interpret, transform and redesign the semiotic resources and signs available to them. Jewitt and Kress (2003) introduced four aspects to the representation of meaning: materiality, framing, design and production, which offer ways to research and analyse the different stages of meaning-making (Albers & Sanders, 2010). Furthermore, the mapping of meta-functions (Jewitt, 2006), funds of knowledge or meaning potential (ideational, interpersonal and textual) provides a way to understand and evaluate the construction of knowledge and identity, within multimodal mediation and meaning-making with new media, in the classroom.

This research makes references to sociocultural theories of learning that stress children's active role in their development and participation in the adult world. It is guided by an interpretive reproduction view about children's evolving existence in their cultures, whereby children do not simply imitate or internalize the world around them but strive to interpret and participate in it, thus collectively producing their own peer worlds and cultures (Corsaro, 1985). The research adheres to the view that children act on and can bring about changes in society (Corsaro, 1997). With respect to children's internalization, appropriation and interpretation of culture, tools, such as language, and other tools for meaning-

making, affordances are important (Gibson, 1977), because they both encode culture and are essential for participating in it.

Biophilia can contribute to a curriculum that encourages reflection and critical discussions. It can be positioned on the human, social and situational side of the spectrum of learning theories. It has the potential to encourage the development of multimodal literacy and personal meaning-making.

Methodology

In this research the activities of students and teachers participating in the *Biophilia* Educational Program in schools in Reykjavík during 2016 are investigated. The focus is on the Dalskóli school and collaborative ways of working. The research at Dalskóli forms a case study within a preschool/ primary school setting and is built on a grounded theory approach. Participants were 11 teachers, one manager and around 70 students (28 preschool students, 27 5th graders and 15 students from after-school classes). Participatory research methods (Groundwater-Smith, Dockett & Bottrell, 2015) were employed, encouraging participants to take part in the research, provide their own data and suggest avenues of research. The researcher developed a collaborative approach, supporting participants in efforts aiming for school development and change. This could entail advice on technical matters and discussions of learning processes and

learning outcomes.

Results

In the early stages of the research, the researcher followed in-service teacher training undertaken by all teachers from several different settings: five elementary schools, two preschools and two after-school class centres, all of which were taking part in the City of Reykjavík *Biophilia* project. The training was given by scientists and experienced teachers from an earlier phase of the *Biophilia* project in Reykjavik. This enabled the teachers to learn about the different educational aspects of *Biophilia*, train themselves in app use, discuss pedagogical approaches and organize themselves as a group for the exchange of ideas and planning. Social media (Facebook) were harnessed for communication and organization, for the whole group as well as individual school groups. This proved invaluable for disseminating ideas and coordination of the large group that met only intermittently during the project period, as well as for smaller groups within each school.

Smaller groups of teachers in the schools then started to figure out the relevance of *Biophilia* to the national core curriculum guide and their school curriculum, as well as to develop interdisciplinary aspects of their teaching plans. Some technical affordances needed improving, especially the reliability of wireless connections. The schools did not normally own an iPad for each student, but they could borrow a set

of iPads from the City of Reykjavík, as well as a travelling tool chest for *Biophilia* that contained various resources for scientific experimentation and creative activities.

Figure 1: Biophilia travel chest / iPads – an affordance supplied by the City of Reykjavík School Division.

The shortage of iPads meant that implementing 1:1 pedagogy and highly personalized learning was not possible and so teachers resorted to strategies of collaboration, whereby students shared iPads for study and project work. The school could also invite scientists and

digital artists to give a talk, discuss scientific problems with students and assist with workshops. This possibility brought expertise to the project where needed. Teachers have autonomy to choose learning materials and teaching aids. They used books on science topics, Internet resources, physical objects, models, science equipment (microscopes), art

materials and various learning apps to offer students a wide-ranging learning experiences, along with the *Biophilia* app album.

At Dalskóli, teachers chose to work on different topics with each age group. The preschool teachers decided to concentrate on learning about the body, a popular topic, and to work with the *Biophilia* app Virus. The after-school class teachers chose to target Crystalline, a game-like app, and explored the scientific structure of crystals with their students. The 5th graders were studying the materials, units, sizes, contexts and activities of the body, genetics and the universe, as well as philosophy in the context of man versus universe, creation myths and mythology. For this, the Virus and Cosmogony apps were mainly explored. The *Biophilia* apps generally served as an inspiration for students when starting the workshops, acting as an introduction to scientific and musical topics relating to different apps. They also served to increase digital literacy and learn more about navigation, play and interactivity. Many students had experience of tablets or computers at home, but some students in preschool had little or no experience of using tablets for anything but gaming or Internet-surfing. The older students, in after-school classes and 5th grade, usually had some computer experience, but did not generally use them for specific learning tasks and working with creative applications for design and production.

The preschool children were quite excited about *Biophilia* app use and expressed

enjoyment about their experiences and playful activities if offered. Their teachers and a visiting scientist introduced the main scientific and artistic concepts and initiated projects, which were then developed through discussion, play, hands-on activities, musical performances and visual art production. An exploration of the body included making instruments to enable students to experience heartbeats and other body sounds (see Fig. 2).

Preschoolers did not use the iPads for creative project work and were restricted in using tablets to go on the Internet. The preschool children worked collaboratively on making one big body to which they gradually added internal organs and a vein system (see Fig.3).

Visual artwork included drawings of cells, various internal organs and the skeleton of the body. The children also made musical instruments that were used in music lessons, for practising rhythms and beats (see Figure 4).

The teachers made notes on children's individual learning and noted how learning topics developed in playful activities, in order to stimulate personal development.

The after-school classes were studying crystals. They examined different kinds of rocks, that the teacher brought to class, directly and through a microscope. They grew their own crystals and the group, in collaboration, made a playful video out in nature about their experiences with the crystals (see Fig.5).

The 5th grade students followed a continuous study programme throughout the term, based on *Biophilia*, and managed to do scientific studies with bacteria, discover genetics through play, act out musical performances, experiment with digital technologies and more. They had full Internet access and could search the Web, choose their tools and technologies (see Fig. 6). They collaboratively created sculptures and 2-dimensional artwork, where their thematic studies were interpreted in various ways, with digital or traditional art materials (see Fig.7) 3-D artwork was made collectively on a big scale and used for performance art (see Fig. 8).

Figure 2: Making instruments to listen to the sounds of the body. Testing the instruments.

Figure 3: Collaborative body/ art project, working with colours and textures – reconstructing the body.

Figure 4: Drawings of people and their organs, musical instruments made from balloons and papier mâché. Text on image to the right, a student's comment reads: "This is a cell dividing itself. It is making a little baby. And this is a nerve cell."

Figure 5: Growing crystals and studying their structure – and beauty.

Figure 6: Experimenting with music software, green-screen filming and hologram creations

Figure 7: Body-inspired paintings were printed with stencils. Lunar cycles were interpreted playing with semi-transparent shapes and light – creating digital shorts.

Figure 8: Collaborative creation of a giant heart. Presented at the harvest festival in Reykjavík.
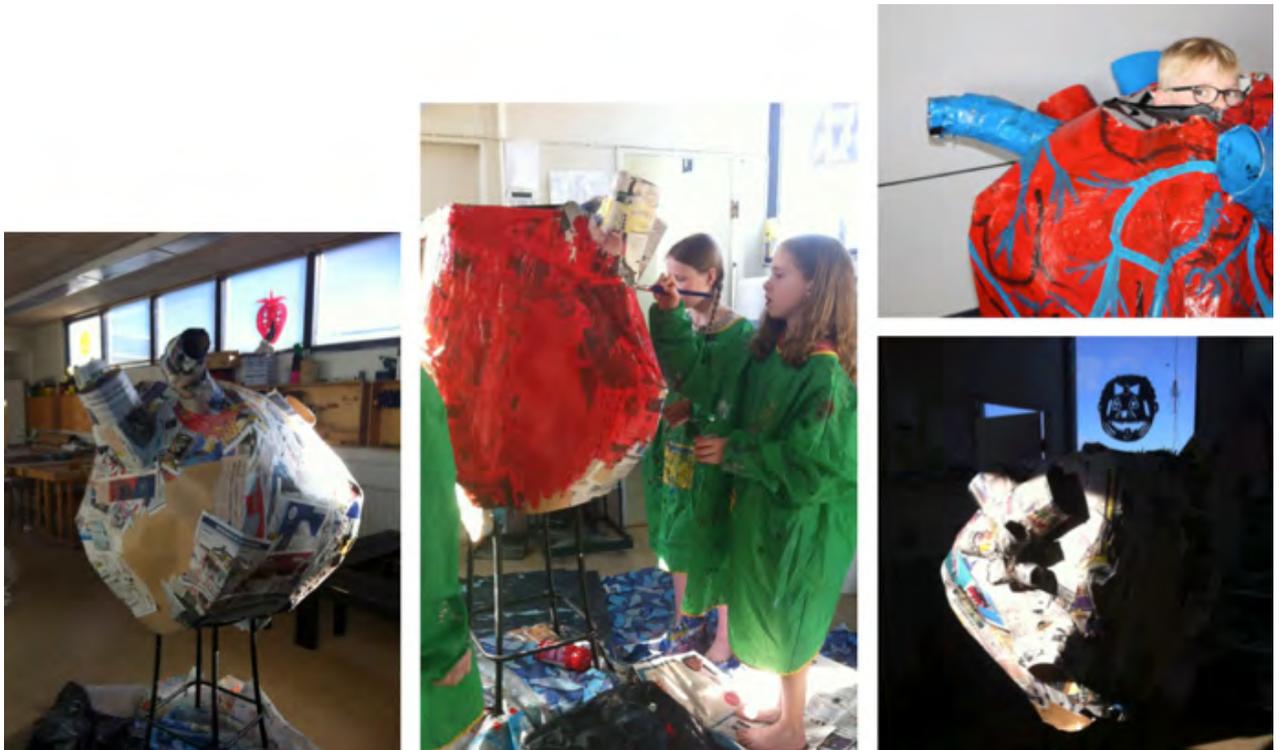
The 5th grade students had to frame their subject matter and plan, design and produce a variety of outcomes of their studies. This work culminated in their own creation myths, written as short stories, designed as storyboards and produced with stop-motion apps or as shorts with iMovie (see Fig.9).

Figure 9: Script, storyboard, prop-making and filming of a creation story – a 5th grade project.

Various scholars have pointed out that education today has become obsessed with a particular type of academic ability, while ignoring or de-emphasising other ways of thinking and acting, even preventing or destroying children´s creative abilities (Robinson, 2001). Our daily existence builds on the use of all our senses and our thinking is affected by all of them too. Much seems to depend on the context, affordances and pedagogies that enable students to connect with their creative potential. In a fast-changing world with rapidly changing demands, the concepts "creativity" and "collaboration" have come into focus as being central, not peripheral, to society at large. Biophilia can be seen as a conscious attempt to address this balance and to pioneer new ways of learning.

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Kids Project: Portuguese children's perceptions and participation in the design of a literacy-learning interface

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Abstract

Digital learning resources intend to be engaging and able to promote effective learning. Still, their final users, learners, feel that there is more to do and further support is needed. Researchers are seeking new opportunities to expand children's learning using new digital contexts and forms, such as multi-literacy practices, multimodal forms and immersive worlds to act on and simultaneously learn, leading to several challenges. This work aims to understand and examine the integration of children's point of view on the design process of digital learning tools for literacy-learning. To this end, a longitudinal and intergenerational co-design study was carried out to develop a literacy-learning interface for primary-school students, aiming to support initial stages of the reading process in a meaning-making and pleasurable way. This investigation seeks to make a contribution to today's discussion of young children's digital literacy practices.

Keywords: Multi-literacies, literacy-learning interface, co-design, children, games.

Introduction

-Technologies are smart and can support learning in classroom. (M., 7-year-old boy)

-Yeah, but still they don't answer all our doubts. They have to be improved! (S., 7-year-old boy) (16/05/13)

The development of technologies and digital media has changed communication and therefore literacy practices have also changed, given that these practices have become digital. This digital turn supported by electronic reading and new text formats, such as e-books, e-mail, websites, podcasts, videos and videogames, has changed ordinary literacy practices [Cope & Kalantzis,2009; Gee, 2007; Mills, 2010; New London Group, 1996].

New Literacies Studies have been showing that reading and writing, as conceived in traditional terms (e.g. decoding and

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understanding words), no longer suffice as literacy skills for meaning-making in the digital era. They argue that literacy practices involve an active and conscious role for the child, or their agency, for the mobilization of a complex set of skills [Cope & Kalantzis,2009]. This involves a daily and broad usage of multimodal sources of meaning (written code, sound, images, movement) that go beyond language [Kress, 2010; 2011], in conscious and critical ways, which have been turning readers and writers into actual designers of meaning [Cope & Kalantzis, 2009; Gee, 2007]. Literacy has been redefined. Literacy is now regarded as multiple literacies with a new learning approach. Learning in the digital age should occur in situated, explicit, transformed and collaborative contexts – this approach is also known as a multi-literacies approach [Cope & Kalantzis,2009; Gee, 2007; Mills, 2010; New London Group, 1996]. Schools have, however, encountered serious difficulties in implementing this approach [Cope & Kalantzis, 2009].

By reviewing strategy games, Gee [2007] found that they have a transferable model for education in order to implement a multi-literacies learning approach. In fact, many argue that the game approach is playful, integrated and has more sense of belonging for children, and it can also bring innovation to learning experiences [Freitas, 2006; Gee, 2007; Prensky, 2001].

In Portugal, where this study is taking place, policies aiming to address the new literacy and technological requirements have included major investments over decades by equipping schools with Information and Communication Technologies (ICT), e.g. the Magalhães laptop (a low-cost computer, part of a Portuguese initiative similar to One Laptop Per Child), reforming the curricula and educating teachers [MoE, 2008]. However, little actual effort has been made in the construction of digital educational resources for hardware (especially learning games to engage children) and teacher training, making its implementation limited and the results far below expectations. Also, after the aforementioned initiatives, new educational policies drastically changed the educational panorama, which became very regulated, focused on evaluation and guided by the metric of good results in maths and the mother tongue, Portuguese. Consequently, ICT practices almost faded away from primary schools.

In this context of transformation and the technological demands of the 21st century fits the Kids Project study. By the time this study began, few digital resources favoured a multi-literacies approach for Portuguese students. In a way, the study sought to deal with frequently asked questions concerning the design process for digital tools for literacy-learning: What does literacy-learning mean in the 21st century? Why do ITC resources, especially games, get children so interested and stuck? What do learners think about current literacy-learning tools? Would they like to redesign them? What do they value? What should they be like and what are the real challenges that

must be considered, in order to design a literacy-learning interface?

Methodology

The investigation was developed based upon interactive and iterative design models, i.e. as user-centred design [Courage and Baxter, 2005], a creative thinking spiral [Resnick, 2007], design thinking [Riverdale & IDEO, 2011], participatory design [Druin,, 2002; Foss, Guha, Papadatos, Clegg, Yip & Walsh, 2012] and cooperative enquiry [Druin, 2002; Foss et al., 2012; Guha, Druin & Fails, 2011]. In cooperative enquiry, children intervene in all iterative cycles of interface design, and they are design partners in an intergenerational research team along with older researchers. All design processes are negotiated from the early stages to the final ones. Ideas Elaboration is a major focus of the research. It is iterative and continuously worked on by all team members, who contribute to the best of their abilities to development of the interface. The youngest produce low-cost prototypes, the oldest high-tech ones, thereby bringing fairness to the process. The literature does not recommend large teams of younger participants, they should not exceed eight elements. Debriefings are also important to perceive all the needs and new orientations for new elaborations of the team [Druin 2002; Foss et al, 2012; Guha et al, 2011; Medeiros, 2013].

Longitudinal data collection involved eight children, four boys and four girls, from a private primary school in Braga, north Portugal, and took place during 2013 and 2015. In 2013, the children were 1st and 2nd graders; and in 2015, the same participants were 3rd and 4th graders (Fig. 1).

Figure 1: Kids project Timeline and Goals

Selection of the children was determined by their ability to express themselves and by parents' availability to take them to the research lab, engagelab, in Guimarães (where the first part of the study took place).

The workshop sessions combined cooperative enquiry with high engagement strategies [Druin, 2002], group animations [Medeiros, 2013], technological immersion [Druin, 2002], wants, needs and prototyping [Courage & Baxter, 2005], game-based learning [Freitas, 2006], game design [Fullerton, 2010] and problem-solving [Jonassen, 2011].

In 2013, during the concept phase, eight design partners participated in workshop

sessions, once a month for four months, in after-school workshop sessions lasting 1h 30m. The goals of Kids Project 1 were assessing priority areas, the motivations and interests of co-designers, interface

features and ideation of a low-cost prototype.

In 2015, the same group restarted its activities at a two-week, morning summer camp at their school, divided into four design partners in each workshop. First, data collection focused on comprehending students' literacy and digital practices in and out of primary school through an initial focus group. Secondly, based on children's insights into ideas elaboration in 2013, a medium-fidelity prototype was made, and a world in MinecraftEdu was used to prototype the game. Children carried out its development via game-designing activities for the prototyped game in creative mode. This solution, within our resource constraints, was allowed, except for audio and voice-recording options. Thirdly, the study's final-assessment focus group was held.

Research data, of a dominant qualitative nature, were collected by direct observation of interactions generated, note-taking by researchers, video and audio recordings, prototype generation and a debriefing documentation process (script, posters, drawings, drafts). All ethical concerns concerning co-design studies with children were addressed; for more details visit the website at: http://www.engagelab.org/ p r o j e c t s / k i d s https:// kidsproject2.wordpress.com/

Results and discussion

The analysis of the set of data collected in 2013 and 2015 has led us to some preliminary results: ideas elaboration (Fig.1) (prototypes and activities to improve literacy-learning); their literacy (and digital) learning experiences (Fig.2).

1. Ideas elaboration:

In 2013, the children started from scratch. They were able to innovate literacy-learning as they intended and most wanted. By the end of Kids Project 1 they had designed a new form of literacy-learning through a micro-world videogame to learn, act in and play (a world, similar to real life, but instead

Figure 2. (Re) design and activities for the school in the middle-fidelity prototype

School building plan with classrooms for specific subjects

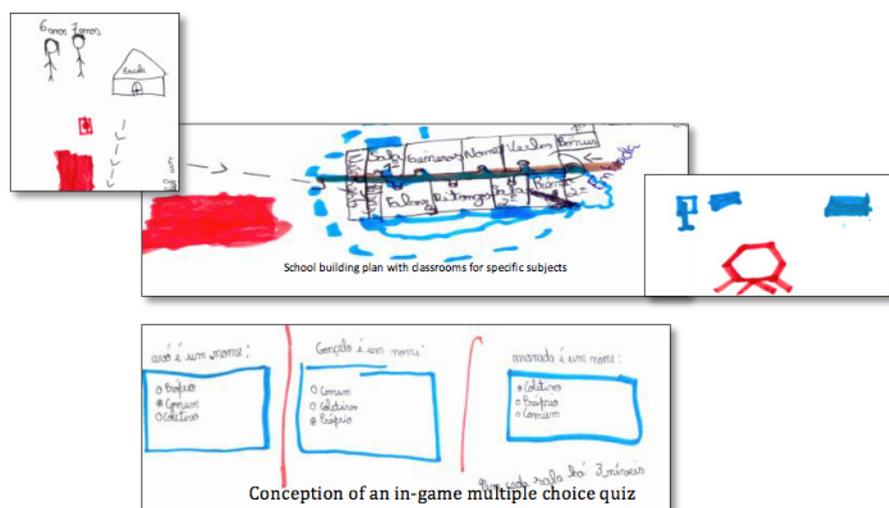Conception of an in-game multiple choice quiz

Figure 3. (Re) design and activities for the library in the middle-fidelity prototype

of humans players were animals, where trivial things that include literacy tasks can be done: go to school, visit a zoo, search for a book in a library, go to a concert hall). It consists of a multimodal representation framed in a multi-literacies learning experience with several new text formats for learning in a situated, explicit, critical and transferable way. They also reflected on some other game features, but differences between the genders started to be noticed early on.

In 2015, the children redesigned literacy-learning activities for the same game with a hands-on game-design experience. As this involved a higher set of skills, creativity and reflection, this was clearly one of the hardest activities for the children to implement.

Here are two examples, school (Fig. 2) and library (Fig. 3). In the first idea, the school itself is a game, and gamers are 6–7-year-old children. In each classroom, there are posters and information blocks, with three

difficulty levels, each corresponding to questions or forms. They had also created books with concepts, definitions and activities to support players – much like their schoolbooks. Players can activate buttons to audio-read texts and ask

questions. In children's conceptions: specialized language is often used, along with learning and training in technical language skills, mostly grammar. In a way, their proposals do not diverge from the standard way they presently learn in school, except for the digital support. In contrast, some elements tend to be disruptive of school redesign, e.g. multimodal guidance (e.g. still images, audio feedback, usage of space in a broader way and a less teacher-oriented way, a teacher being many times not necessarily present).

The second idea is a library (Fig. 3), and it too has continuity elements, such as texts presented in traditional formats and with written representation code (this implementation may have been biased by MinecraftEdu's own features). However, the children mentioned several disruptive elements: constant agency, play and meaning-making features; players increasingly acting out complex roles; the ability to know deeply (being able to consult bookshelf books on their new interests, other authors, different themes, crafting); multimodal guidance (Spatial – e.g. using mini-maps to find everybody's location, location pins, to know who has been in a certain place; Audio – e.g. voice audio help, and ability to record and play; Visual – e.g.

using decorative elements to be able to coherently distinguish different activity areas; Realism and interaction — e.g. in choosing materials, colours and textures, and also to be able to create and manipulate different objects).

2. Their literacy (and digital) learning experiences:

2.1. The literacy tools used in their school are out of (digital) context and unrelated to current literacy practices. They need to be redesigned. the children's feedback on the current "traditional" learning system, methodologies and tools is that it is "repetitive" and "boring", and so learning by playing should occur more often.

2.2. There is a huge contrast between digital experiences in and out of school. Children's literacy learning experience is mostly "traditional-like" and "exam-like", not making use of ICT at school (even with available resources), in contrast with its frequent use after school. In 2013, these children were having full unguided access to ICT at home (e.g. videogames, music and video), but in 2015, their parents limited their access to digital practices, only to support school learning activities, allowing videogames only at weekends (because final exams in primary school were coming soon).

2.3. The analysis revealed that children's opinions about ICT use for literacy learning at school were variable and uncertain, along with its frequency of use at primary school (e.g. regarding the presence of ICT

and videogames in schools for literacy learning: In 2013, the answer was "totally yes"; in 2015, before the intervention plan of hands-on game-design, it was "totally no"; and after the intervention plan, "yes with reservations").

2.4. We should not take for granted that digital natives are always avid technology consumers. Consider the following three examples:

2.4.1. The embodiment and manipulation of traditional writing objects, in the opinion of children, continue to be valued. Consensually, the group says handwriting is an exercise for writing various genres of texts and still widely used.

2.4.2. Do not just simply include digital, new learning materials should not be too educative and look like school, or common educational SW; they must be lots of fun, as entertaining games, if not they "are boring".

2.4.3. Multimodality is important, but not always. It is not a ubiquitous condition. They considered that it is important and facilitates learning, particularly in the first years. However, some experienced students/ readers say that "sometimes book illustrations affect the imagination (and their mental representations)"

This is a limited and circumscribed study, and every participant is conditioned by their past, personal experience. It may not truly portray, in its entirety, the Portuguese educational reality, but it certainly gives

some hints and important leads. Who should pay attention: policy-makers, researchers, schools, teachers, book-editors and SW developers, parents and children.

The highlight was a clear step backwards in the design proposals of these children compared to what they proposed in 2013, especially in terms of digital practices and perceptions. The reason behind these revelations is probably the negative impact on changing educative policies, and also a school very devoted to final results, one that does not favour learning with digital tools nor promote design-meaning, creative and critical thinking and other sets of skills for the 21st century.

The research model is extensive and time-consuming, it is also known as being innovative, challenging and rich, which benefits scientific knowledge, products and children via the co-design experience [Druin, 2002]. Kids Project allowed children agency skills as design partners in the design of literacy (and digital) innovative practices, with new "ways" and "modes" of learning [[Cope & Kalantzis, 2009; Druin, 2002; Freitas, 2006; Gee, 2007; Kress, 2010; 2011]. On a positive note, experiencing hands-on game design has proven to be an effective focal point. It turned out that the chosen methodological process was one that allowed the inclusion of children (and gender) in the design of spaces. The tools and time provided allowed them to engage in opportunities to create, play, build, have hands-on experiences, reflect, share and question

literacy-learning practices by making a determined effort.

Final remarks

In the current context of the redefinition of educational policies and literacy practices, which are a priori more participant-led and critical than in the past, it is fundamental to perceive children's perceptions and participation in the design of a literacy-learning interface. This participatory and hands-on study "voiced" children about their literacy experience and their contribution to innovate in literacy learning in primary schools. The children, within the limits of their experience, skills and maturity, were quite advanced in their representations. The results are a breakthrough in the current educational context but also allow discussion of some interface features, models, and activities in order to implement an innovative approach based on multimodal meanings and multi-literacy practices.

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Beneficial Effects of Digital Early Literacy Interventions in Kindergarten Children Born Late Preterm

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Abstract

Digital interventions can be more stimulating for early literacy skills than business as usual. The current study targeted a vulnerable group, children born late preterm. These children, prone to experiencing increased levels of stress reactivity, benefit strongly from working with 'Living Letters', a digital intervention program stimulating alphabetic knowledge and phonemic awareness. The program is probably so beneficial to these children because it offers contingent verbal input, sequential to and dependent on the child's behaviour. Such programs may have a soothing effect on easily stressed children, enabling them to utilize their full learning potential. It is therefore important that such programs become a solid part of the kindergarten curriculum.

Introduction

Computers may play new roles in assisting and supporting good literacy teaching for emerging readers and writers. But do they do so in current practice? Since it is easier to tailor the format and content of Web-based programs to individual differences and needs than to ensure that classroom instruction meets the needs of each and every pupil, computer programs may be an attractive tool for providing additional home-like experiences with literacy in kindergarten classrooms to advance the early literacy skills of young children, especially those at risk. While there is increasing interest in using computer programs in support of instruction in the early stages of becoming literate, there is a dearth of evidence regarding the efficiency of such computer programs as tools to provide young children with relevant practice. The target program in our study, Living Letters, aims at familiarizing children with the alphabetic principle, i.e. understanding that letters represent sounds in spoken words and can be used to create

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an infinite number of words. Understanding the alphabetic principle is not a natural skill, as is clearly demonstrated by the reaction of a three-year-old boy to a picture storybook entitled "O van Opa [G of granddad]". A recurring theme in this booklet is the first letter /o/ of opa. For instance, the main character in the booklet notices that when granddad smokes his cigar he produces circles like his first letter: the letter O. After having heard the storybook several times, the three-year-old boy wondered what the letter of his opa [granddad] would be now that 'O' had been taken by the granddad of the boy in the booklet.

In this manuscript we present experiences with Living Letters. The program was created for children delayed in acquiring alphabetic and phonetic skills. Do children benefit from this program and improve their basic literacy skills when they have a chance to play with this program in the classroom? Or does the program provide stimulation similar to that already offered in the classroom, thereby not adding anything to an abundance of daily experiences with letters and words.

Living Letters is a digital program for three- to five-year-old children, designed to promote phonological awareness and letter knowledge. The program consists of a range of short games in which children learn to recognize the shape and sound of the first letter of their name. They practise recognizing their own name between a series of scribbles, recognizing the first letter of their own name between other letters, and identifying pictures that start with the same sound as their first name.

The program offers responsive replies to each reaction of the child. The reaction of the computer is not only prompt and dependent on the child's focus of attention, it also has a positive, supportive tone and adds constructive, instructive information. For instance, a first error in an assignment is followed by a repetition of the question, a second error by a hint and a third by a demonstration of the correct solution. Figure 1 flowcharts the questions and replies in solving the assignments in this educational computer program.

Theoretical framework

From a previous experiment in which delayed five-year-olds played with the program Living Letters, it appeared that not all children benefit from the program. The research so far reveals results in line with the idea that only a minority of kindergartners benefit from the program (Van der Kooy-Hofland, Van der Kooy, Bus, Van IJzendoorn & Bonsel, 2012).

Exploring the effects of Living Letters we found evidence supporting the theory that groups at risk benefited most from the program (e.g. Gutbord, Wolke, Soehne, Ohrt & Riegel, 1999;Van Baar, Vermaas, Knots, De Kleine & Soons, 2009). In particular children with mild perinatal adversities, i.e children who are small for their gestational age at birth or children born late preterm (between the 34th and 38th weeks of pregnancy) were found to

Figure 1: Feedback circle for Living Letters
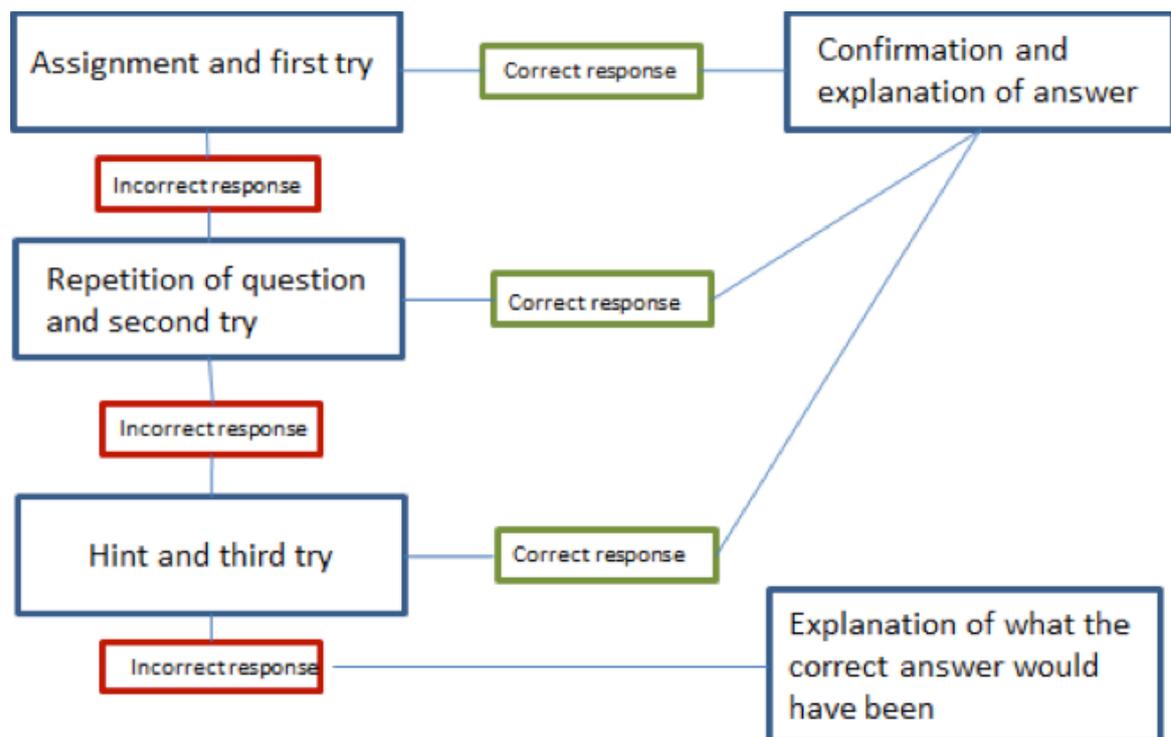
benefit from Living Letters, while their peers without these adversities did not benefit from working with the program (Van der Kooy-Hofland et al., 2012). We designed new experiments to test this finding in other samples and to come to understand why, especially, children with perinatal adversities benefited.

We argued that, in particular children in need of sensitive, contingent verbal input, i.e. responses that are sequential to, and dependent on, children's behaviour, may benefit from Living Letters. From the literature comes evidence that late preterm children may have such needs. These children typically show increased levels of stress reactivity. In those cases intra-uterine changes (e.g. fewer nutrients, high levels of cortisol) can, via early programming, induce a hyper-reactive HPA (hypothalamic pituitary adrenal) axis – a major part of the neuroendocrine system – resulting in lifelong vulnerability to stress (Buske-Kirschbaum, Krieger, Wilkes, Rauh, Weiss & Hellhammer, 2009; Matthews, 2002). The HPA axis is central in coping with stress (Aisa, Tordera, Lasheras, Del Río& Ramírez, 2006), since it controls the secretion of cortisol – the most important human-stress hormone (Kolb & Whishaw, 2009). Dysfunctionality along the HPA axis can result in increased stress reactivity, and thus in increased levels of stress in daily life situations. These elevated stress levels can cause children to cut themselves off from learning experiences (Gotlib, Joormann, Minor, & Hallmayer, 2008). Consequently, these children may not optimally benefit from their regular learning environment and may therefore be at increased risk of falling behind when compared to their full-term-born peers.

Figure 2: An exemplary assignment in the CLT for Kindergarten Pupils. Question: 'In which picture do you see picking up? Underline picking up.' (Cito, 1996)

A learning environment like Living Letters might be helpful for these stress-reactive pupils. Living Letters offers sensitive, contingent verbal input sequential to, and dependent on, the child's behaviour. These features might have a reassuring and soothing effect on children who experience high levels of stress, enabling them to open up to the learning environment and utilize their full potential.

Methodology

Design

Our study took place in a large number of Dutch kindergarten classrooms, spread across the entire country. Participating schools showed particular interest in utilizing digital material to support pupils with early literacy delays. Thanks to the computerized treatment, it was possible to randomly assign children from the same classrooms to different treatment conditions, since the actions the teachers had to take were the same for children in both conditions: by clicking on the name of the child, the teachers automatically started the intervention, or the control program, for the participating child. The post-test was a digital literacy test designed by the researchers. This test was administered individually by the teacher. Reliable perinatal information was collected from a nationwide register(Stichting Perinatale Registratie Nederland, 2011).

Participants

The final sample, for which complete data on predictive variables and on the post-test directly after completing the intervention were available, consisted of 423 children with a mean age of 67 months. The final sample included data from 144 different schools. A small majority of participants were male (54.9%).

Procedure From August to February schools were recruited by sending out flyers and letters containing information about the content and purpose of the study via both email and the post (http://www.watwerktvoorwie.nl). We offered

participating schools three months of free access to educational computer programs, this normally requires a paid subscription (http://www.bereslim.nl). When teachers agreed to participate they were asked to select pupils from their classroom achieving poorly in literacy. Those eligible were, for instance, pupils who were not yet able to write their name properly, to rhyme, to name a few letters or to identify sounds in words. Preferably, these children scored in the lowest ranges (below the 40th percentile) on the standardized literacy test CLT administered in January (Lansink & Hemker, 2010). If there were not enough eligible children scoring below the 40th percentile, teachers also included other children who they believed were in need of additional guidance in the field of early literacy. Parents were asked to provide informed written consent.

We focused on the contrast between Living Letters and a digital control condition that did not stimulate alphabetic knowledge or phonemic awareness. Per classroom, slightly less than two children participated in this study (Mean = 1.65 children per classroom, SD = .89). Children were randomly assigned to conditions by one of the researchers. The sessions took place once a week over the course of 15 weeks. Except for logging in, which had to be done by the teacher, children worked on their own, without adult assistance. During playtime, children wore headphones in order to prevent disturbing other children. Children worked with a mouse and did not have to use a keyboard.

Target program

In the target program, Living Letters, designed to promote alphabetic knowledge and phonemic awareness in young children, an online tutor provided the children with adaptive feedback, as is common practice in Intelligent Tutoring Systems (ITSs). In the first 22 games of Living Letter,s children practised recognizing their own written name (or 'mamma' when their own name was not available in the program) between other symbol strings or scribbles, or they had to recognize the first letter of their own name between other letters. The next six games focused on the sound of the first letter of the child's name. In the last twelve games, children had to select pictures of words starting or ending with the first letter of their own name. The digital tutor, a teddy bear, provided responses sequential to, and dependent on, the child's behaviour. The bear not only provided feedback as to the accuracy of the answers but also offered hints and explanations, which were intended to focus the student on target problems and aid them in solving them. Control children worked with a storybook reading program for the same period of time. This program included eight digital, animated, age-appropriate stories based on popular children's books. Books were read to the children by a computerized voice while children watched animations and listened to background sounds and music. Text was not presented as print on screen, only orally.

Pre- and post-test

As a pretest, the Cito Literacy Test (CLT) for Kindergarten Pupils in January/ February was used. The CLT is a group-administered test applied in January/ February and May/ June of each school year that tracks children's progress in different learning domains. The literacy test administered in kindergarten consisted of 60 paper-pencil, multiple-choice questions measuring a range of language and literacy skills, e.g. vocabulary, rhyming, hearing the first or last word in a sentence, sound-blending, writing conventions and listening comprehension (Lansink & Hemker, 2010). See Figure 2 for an example of an item. The pretest was coded as either below average (0, score of 59 or below) or average and above (1, score of 59 and beyond).

After children finished working with the program, teachers administered three tests individually: a Phonemic Awareness Task which included five items in which children had to identify the first sound of five different words (e.g. 'What sound do you hear at the beginning of 'bike'?'), a Letter

Knowledge Task in which children identified letters (e.g. 'What is the name of the letter you see here?) and a Word Picture Task in which children were asked to match the correct printed word with a picture (e.g. 'Where do you see the word that spells 'roof'?' – Fig 3). Scores were, with the use of principal component analysis (PCA), combined into an aggregate measure of alphabetic knowledge and phonemic awareness, explaining 67.33% of the variance.

Figure 3: Example of items used in the Word Picture Task in the post-test measuring early literacy

Raaf   Ruup   Roof   Faak
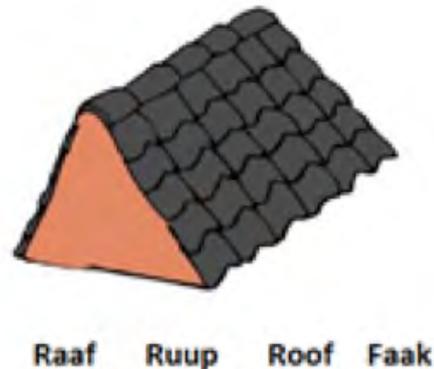
Perinatal data

The coverage of the PRN is about 96 per cent of all deliveries in the Netherlands. The data are annually sent to the national registry office, where a number of range and consistency checks are conducted. The perinatal register can be accessed by researchers, provided that they have written permission from the mother.

Results

We carried out a multilevel analysis, regressing alphabetic knowledge and phonemic awareness on gender, age, educational level of the father (assessed on a 7-point scale), condition (Living Letters vs control condition), small for gestational age, being born late preterm and the two two-way interactions between conditions and mild perinatal adversities. There were no main effects for condition ($t(368.42)=-1.05$ $p=.294$), being small for gestational age ($t(404.176)= -.59$, $p=.556$) or being born late preterm ($t(406.48)= -1.35$, $p=.156$). An

interaction between being born late preterm and condition was, however, found (t(398.40)= 1.98, p=.048). This interaction is depicted in Figure 4.

Children born late preterm fell behind when assigned to the control program, but outperformed their peers born full term when assigned to the target program Living Letters. This program with sensitive contingent verbal input thus seems to be highly effective for children born late preterm, while the group as a whole and children born full term did not benefit. The interaction between small for gestational age and condition was not significant (t(407.19) =.36, p = .720).

The results corroborate the theory that Living Letters is especially effective for children born late preterm, while these children fall behind when assigned to a control program. Their full-term born peers did not benefit from Living Letters and did not outperform children who did not receive the program. The efficacy of Living Letters for children born late preterm might be explained by the theory that these children, who are prone to experiencing higher levels of stress reactivity, are soothed by the central features of the program, thus allowing them to benefit optimally from their learning environment.

Children who experience high levels of tension or stress in daily life situations, such as in the classroom, can benefit from programs that offer sensitive, contingent verbal input sequential to, and dependent on, the child's behaviour. These programs, which probably have a soothing effect on stressed children, can help them to develop their full potential. Such programs may be an important contribution to kindergarten since they give a unique stand-alone boost to the literacy performance of a subgroup of children who have problems with benefiting from the common curriculum. Digital programs should not therefore be

Figure 4: Late preterm children (dark bars) benefited from Living Letters but lagged behind with the control program. The non-preterm group did not benefit more from Living Letters than from the control program.
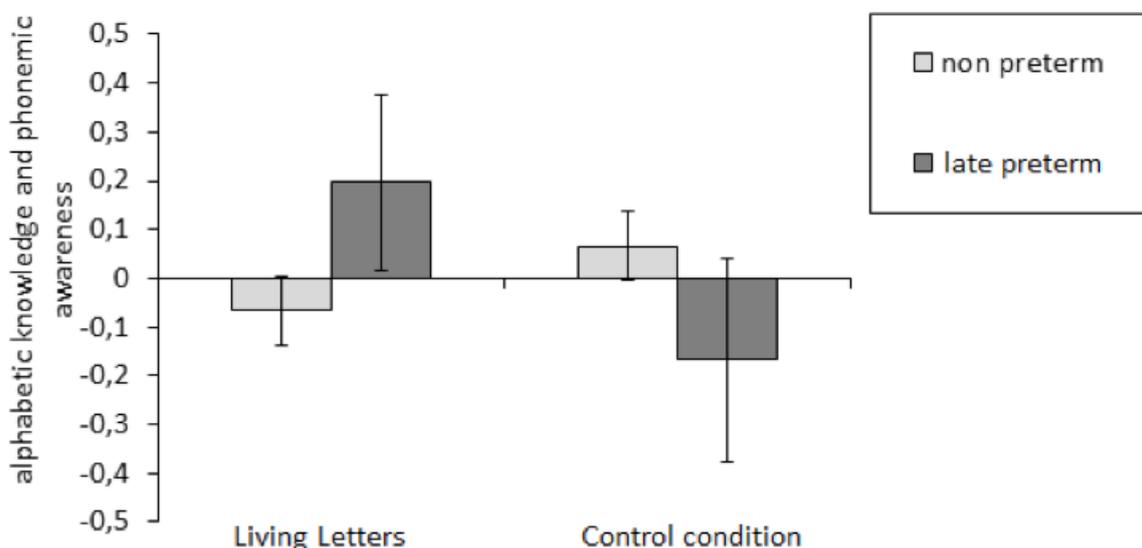
regarded as a nice 'bonus', but should rather become a solid part of the kindergarten curriculum.

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Unicorn in Rainbow Park: A glance at young children's game design ideas

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Abstract

In this study, 5-to7-year-old Finnish children were asked to show, by drawing a design, what would be "the best game in the world" for them. Data were analyzed through a framework of game design elements. Children were found to be keen to modify existing games by adding new things to them. Often these additions had their roots in other meaningful media texts. Thus, children's game ideas became collage-like representations of their lifeworld, which highlights the importance of the aesthetic element of game design (i.e. the emotional aspects of a gaming experience).

Keywords: Digital games, game literacy, game design, preschool, drawing

Introduction

Due the fast-paced digitization of (Western) societies, the question of how to integrate digital media into early childhood education (ECE) has become a topical subject in academic and practical discussions. Based on previous research (e.g. Blackwell, Lauricella & Wartella, 2016; Falloon, 2013; Kjällander & Moinian, 2014; Vangsnes, Økland & Krumsvik, 2012), playing educational games to support different curriculum areas, i.e. literacy and mathematics, appears to be the most common scenario. Nonetheless, their successful integration is a tricky business. Kjällander and Moinian (2014) observed that when children do not find a game design interesting enough, they may rapidly discard the didactic designs of the game-maker and teacher and transform the game into a more playful and exploratory form of action. In a study by Falloon (2013), only four out of 18 children were able to largely ignore potentially distracting content (such as responsive animations) and keep their focus on learning goals. It also seems that teacher mediation is not always enough to overcome these obstacles. In their study, Vangsnes et al. (2012) found that when a teacher tries to start a dialogue by asking questions in order to make children go more thoroughly into a matter, the children are concentrating too much on gameplay to pay attention to a teacher's meta-didactic

intentions. The authors' conclusion was that children and teacher in a gaming situation have different agendas: the playing child has a perspective of playing the game, while the teacher has an educational perspective.

To sum up, in my interpretation, these examples reveal a mismatch between how children experience games and how games are integrated into ECE. The teachers in the aforementioned studies understood games as a medium to teach children something. However, for the children, the gameplay was meaningful for its own sake and according to their own rules; thus, they were not committed to the didactic designs of teachers or games. This disparity becomes more evident when attention is paid to the games children play at home: most games played by Finnish 0- to 8-year-old children in 2013 were Angry Birds and the games at LEGO.com (Suoninen, 2014). None of these games (there are dozens of games on Lego.com) are 'just a game', as they also exist as cartoons and movies. Besides playing games, children often talk about games and engage in game-related role plays (Aarsand, 2010). From this perspective, the idea of using games merely to deliver information is an insufficient starting point for pedagogical planning, and Buckingham and Burn (2007) have argued that teaching children about games as a cultural form is a necessary prerequisite for using games in order to teach other curriculum areas.

Theoretical framework

According to Buckingham and Burn (2007), learning about games can be understood as a development of functional and critical game literacy. Functional literacy includes basic hardware skills (i.e. the ability to load and save a game) and software skills (i.e. the ability to navigate around a game space). Critical literacy, in turn, refers to the ability to reflect critically on games, gameplay and game culture. One potential framework for (critical) game literacy education is to analyze their design elements which, based on Zichermann and Cunningham's (2011) description, consist of mechanics, dynamics and aesthetics. Mechanics is the functioning components of a game and these are controlled by the designer. The primary elements of mechanics are points, levels, leader boards, badges, challenges/ quests, on-boarding and engagement loops. Dynamics is the interaction between player and mechanisms, and aesthetics is the quality of the experiences and feelings the interaction creates (2011, 35–76). Buckingham and Burn (2007) emphasize the importance of also exploring games and gaming as a social phenomenon. According to Aarsand (2010), digital games that are good and cool have become objects of negotiation and, on the basis of their knowledge, children are sorted into different categories by their peers.

Mertala and Salomaa (2016) have suggested that these aspects could be addressed in ECE by asking children why they like certain games and when playing

games is fun and when it is not via visual mediums, i.e. drawing and crafting. In this way, early childhood teachers can help children begin to recognize the connection between game structure (mechanics and dynamics) and its effect on children's emotions during and after gameplay (aesthetics). Grounding in the principles of contemporary childhood studies, visual methods, such as drawing, are understood to be both a form of narration and a supportive medium for spoken narration (Einarsdottir, Dockett & Perry, 2009).

Methodology

Data for this study were collected from "The Best Game in the World" project carried out in collaboration with one preschool class consisting of 26 5- to 7-year-old children (17 boys, nine girls) in spring 2016. Teachers of the class had noticed that digital games were a frequent theme in what the children play, discuss and draw (see Aarsand, 2010) and had begun to think how they could take games (as a cultural form) into account within their teaching. I, as an "honorary preschooler" (I have regular collaborated with the teachers since 2013 and was familiar with the children as well), was invited to take part in the planning and implementation of the project.

As a first step, we thought it would be important to find out what things children find meaningful in games. To get this information, the children were asked, via drawing to design, what would be "the best

game in the world" (see Mertala & Salomaa, 2016). During and after drawing, the children were asked about the games they had designed (what the rules are, what needs to be done to play it, why it is a good game etc.). Questions about the games they play at home, and if they engage in role-plays with game-related themes, were asked in order to gather information about what types of gaming and game-related activities children find important and meaningful. Also, to get more information about the social nature of games, the children were asked if they could think of some other children who would like playing such games. These informal interviews were done by either the teacher or me. Children's narration and the spontaneous comments they made while drawing were written down on observation sheets containing interview themes (see Einarsdottir et al., 2009). The data consist of 27 drawings (one of the girls made two) and 26 interview sheets. Two (research) questions were asked regarding the data:

1. How are game design elements represented in the children's game-design ideas?

2. Why are these elements meaningful for the children?

The analysis process consists of two stages: first, theory-driven analysis was used to examine how different design elements – mechanics, dynamics and aesthetics (Zichermann & Cunningham, 2011) – were represented in the pictures and narratives. Second, applying a more data-driven approach, the author tried to

understand the origins of and motives for the children's game-design ideas. Extracts from the data are presented in the "Results" section to improve the reliability and clarity of the research.

Results

In order to represent the complexity of the narratives and ideas of individual children, the results section concentrates on the data produced by one of the girls, 6-year-old Alina[2]. She is what Patton (2002) describes as an informant-rich case: she was not only talkative, but her narration (both drawn and spoken) was rich in detail and included many of the themes and phenomena expressed by the other children too.

> *"This is called the Rainbow Park. One must find ice cream cones to keep moving. When they eat the cone, they can run really fast. They are like a kind of power stones. The girl is called Alexandra. She runs with a cat and a dog. The cat is called Miisa and the dog Mikko. The cat has the same name as my cat, because it looks a bit like her. If they find a rainbow, they can use it as a slide if they want. The unicorn is a fast runner, and if they want, they can ride with it. When they have reached the goal, they get ice cream cones. After they have eaten it, they fall asleep."*

In these words, Alina described her "best game in the world", also in a drawing (Fig. 1). During the discussion, it became apparent that, while Alina plays digital games at home (i.e. Singstar with her father), Alina's game idea was inspired by a children's TV show, 'The Game Challenge', aired by the Finnish national broadcasting company, YLE. In Game Challenge, primary school-aged children design and programme games in small groups. During the discussion, Alina said that:

> *"I have watched the Game Challenge*

Figure 1. Alina's drawing and a screenshot from Game Challenge.

2 Alina is a pseudonym used to protect the identity of the participant. The name of the character, Alexandra, is also changed to correspond to the phonetics of real names. The cat's name has also been changed.

many times. The one in which they collect the rainbow stones is a nice Nonetheless, the similarities between the game ideas of Alina and Team Creepers were not straight reproductions but rather selected influences. Alina expressed being aware of this, as she found her own game idea to be "bit funnier" than the (at the time unfinished) game by Team Creepers. Alina gave the girl character a name (Alexandra), which had some resemblance to her own name. She also drew the girl as having blond hair, like hers. She also gave the cat the same name as her own cat, and she gave a name to the dog, too. The quest in Alina's game was to collect ice cream instead of rainbows. A rainbow was included in the game as an artefact that Alexandra and her cat and dog could use as a slide. The most significant difference, however, is the unicorn. It was not present in Team Creepers' game, but in Alina's drawing it is the largest figure. The reason for this became clear when Alina said:

> *"Unicorns are just my favourite things in the world! Sometimes, we play them with lina [sister] [for] so long that lina says, 'This is boring.' We have one unicorn, which has diamonds on it, and when it is pressed, its horn starts to glow."*

Alina's interest in and affection for unicorns seems to have (at least partially) cultural media origins, as the toy unicorn she told me about is probably a unicorn called Rarity from My Little Pony.

Examples of mechanics in Alina's game were characters, challenges and rewards. In order to keep moving, Alexandra had to

game. This is a bit funnier."

look for ice cream cones, which also helped her to move faster. Alina referred to them as 'kind of power stones'. Power-ups, which give players extra strength and power, are common elements in several games, e.g. in Super Mario game players can make Mario bigger and get extra lives by collecting magical mushrooms. Analysis of the dynamics represented in Alina's game idea revealed them to be quite open; while the ice cream cones were needed to stay in motion, nothing in Alina's narration implies that riding the unicorn or sliding down the rainbow would require, for example, that the player collect a certain amount of ice cream. In other words, in Alina's game idea, all the appealing elements were not only responsive but also easily accessible. Further, the mechanics Alina designed in Rainbow Park give the player a high degree of freedom. One could argue that, rather than an intentional choice, the openness of the dynamics is due to lack of competence in designing mechanics. I find this argument overly simplistic for two reasons: First, it is not that Alina's game idea had no mechanics, as there were, among others, rules (the need to collect cones to stay in motion) and rewards (the ability to move faster after eating a cone). Second, I understand Alina's comment 'This is a bit funnier' as referring to intentional modification.

Nonetheless, the importance of open dynamics in Rainbow Park is best explained when its meaning explored through the lens of aesthetics. The

similarities between Alina's and Alexandra's names and hair colour imply that she identifies herself with the character (Mertala, Karikoski, Tähtinen & Sarenius, 2016) and, as discussed earlier, Alina enjoys unicorns, which are a common theme in her plays. As one of the most important aspects of games for children is the imaginary worlds that allow children to do things that are not convincing in their everyday lives (Ermi & Mäyrä, 2007), from an aesthetic perspective, the key element in Alina's game idea is that it allows her to do things she would otherwise not be able to do: riding a unicorn is not possible when playing with a small plastic figure, but the game is built around her (i.e. her physical appearance) and her favourite things; and the dynamics are designed in a way that causes no frustration. In other words, by understanding the engaging nature of digital games (Vangsnes et al., 2012), the aesthetic experience reflected in the game idea can be understood as pleasurable. Alina also named her sister and three friends (one was from preschool) as the ones who would like such a game, which implies that Alina would not be the only one.

Conclusion

While not generalizable, this small-scale study suggests that when young children are given a supportive and good-spirited forum to discuss digital games, they have a lot to say. All the participating children were willing to draw and design games as well as talk about them and (their own) game

culture (i.e. game-related role plays). For example one of the boys had been sick on the first three data-collection days. When I researcher arrived on the fourth day, the first thing the boy did was to make sure that that day it would be his turn. This study focused on the data produced by a 6-year-old girl called Alina. Her game idea was a fascinating and complex tapestry of old and new, everyday life and fantasy, experiences and dreams. Also, the convergent nature of contemporary media culture, as discussed in the introduction, was apparent in Alina's game design: the idea was influenced by another game, yet Alina had not played that game, she had only seen it (and its design process) on television. And the appearance of the unicorn had at least, in part, cultural media roots, as Alina noted that she likes to play with a My Little Pony unicorn. It is evident that the complexity of games as a cultural form cannot be covered by the prevailing practice of using educational games as boosters for children's learning in other curriculum areas (e.g. Blackwell et al., 2016; Falloon, 2013; Kjällander & Moinian, 2014).

From the perspective of game-design elements (Zichermann & Cunningham, 2011), Alina's case suggests that, in terms of research and pedagogy, more could be done to consider the relationship between young children and the aesthetic dimension of games, gameplay and game culture. Even though Alina played commercial digital games, she was most impressed by an unfinished game made by children not much older than herself. This notion raises several questions for future studies to

consider, including: what does it mean for children to observe how games are made, and what is added by the fact that the game designers observed are children? Nonetheless, if children's (own) culture and meaning-making with games (Aarsand, 2010) are taken as the viewpoint, the most interesting question (in my opinion) is if there are children who would find Alina's game as appealing as Alina found the one by Team Creepers. Alina herself thought so, and she named four other children that she believes would like to play such a game. As a father of a 4-year-old girl, who is really into unicorns (and definitely not against ice cream and rainbows, either), I could add one more to the list.

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Collaborative learning through film production on iPad: Touch creates conflicts

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Abstract

This paper considers how new media technology and its affordances challenge young children's collaborative learning through film production in school. By conducting a multimodal interactional analysis of children's interaction when making film, this paper sheds light on children's acting and meaning-making together in a multimodal composing practice. I will highlight this with one illustrative example from one group's filming to show how the communicative mode of touch is essential for collaboration in the group and for their final film, and how the mode of touch can create conflict in a group.

Keywords: Collaboration, film production, affordances, embodied interaction, touch.

Introduction

Unlike other mobile devices, iPads have been widely admitted into educational settings in Denmark (Meyer, 2015) and today media literacy is seen as a cross-cutting issue in Danish schools (www.emu.dk). When it concerns multimodality, it plays a central role in the curriculum in Danish state schools and film production has its own section located under multimodality (www.emu.dk). Today, it is possible to film, edit and export material within the same device when producing audio-visual material, which means we do not need a separate camera, cable and computer. What does this technological development mean for children's collaborative learning when working on film production in schools? Research into this can contribute to our understanding of the affordances of touch-pad technologies in a collaborative multimodal composing practice in schools and to our understanding of children's film literacy, including their digital literacy. This paper only presents findings that contribute to the first notion.

Theoretical framework

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My theoretical framework is a multimodal one and positions itself among research studies that combine new literacy studies and multimodality. I am inspired by other studies that draw on this theoretical framework. To mention a few, these are studies investigating children's literacy practices and text-making (Moss, 2003; Kenner, 2004; Gilje, 2010; Gilje, 2009; Frølunde, 2009). The bringing together of multimodality and new literacy studies was first achieved through a number of edited collections, whereby researchers explored intersection in their work (Street et al., 2009). Jewitt and Kress place literacy within the wider field of multimodality (Jewitt and Kress, 2003). Kress argues in his book, Literacy in the new media age (2003), that it is no longer possible to think about literacy in isolation from a vast array of social, technological and economic factors. Kress further elaborates on what literacy means today. He sees a broad move from the dominance of writing and the medium of the book to a new dominance of the image and the medium of the screen (Kress, 2003). In new literacy studies, new media play an important role because they make it easy to apply a multiplicity of modes, such as images (still or moving), music and sound effects. What Kress stresses is that no single linguistic theory can provide a full account of what literacy actually is (Kress, 2003). To do this we need to adopt a multimodal approach to understand texts and communication. Also, studies on touch technologies and literacy with young children are beginning to be conducted even though this is still in its infancy.

Simpson, Maureen and Rowsell (2013: 123) examined the integration of tablet technologies such as iPad into literacy lessons to see how reading and meaning-making occur within this digital medium in primary and secondary school classrooms. Their findings show that the affordances of touch technologies allow for multimodal, multidirectional reading paths (Simpson, Maureen and Rowsell, 2013: 123). They suggest that the current awareness of the mode of gesture needs to be expanded.

In my study I draw on Norris's approach to multimodality, which operates with the concepts of communicative mode, mediated action, higher-level action, lower-level action, frozen action and modal density (Norris, 2014). In contrast to Kress and Van Leuwen (2001), for example, Norris does not distinguish between mode (gesture for example) and media (hand for example), but uses communicative mode as a term that encompasses both aspects (Norris, 2014:88). Norris is interested in investigating social interaction and she calls her unit of analysis mediated action (Norris, 20014: 88). "When using the mediated action as our unit of analysis, the action can neither be analysed without analysing the social actor(s) who is(are) performing the action, nor can it be analysed without the meditational means that the social actor(s) draw(s) on when performing the action" (Norris, 2014: 89). Norris uses the terms higher-level action, lower-level action and frozen action to structure her mediated actions (unit of analysis). A higher-level action has a beginning and an ending. She uses the example of a family dinner as a

higher-level action (Norris, 2014: 89). In this higher-level action are embedded other higher-level actions, e.g. a starter, a main course and a dessert. But a conversation during dinner is also a higher-level action. These higher-level actions are constructed via many chains of lower-level actions, such as spoken language, gestures and posture. But as Norris writes "meaning is not only constructed through actions, but also through objects in the world" (Norris, 2014: 90). These are represented by buildings, furniture and paintings, for example, and are described as frozen actions, since objects also entail actions (Norris, 2014: 90). I am also inspired by Norris's concept of modal density. Using this concept she tries to make visible the communicative modes that play a central role in an action and which are relevant in a specific action. In addition, these concepts help us to understand the interaction between various communicative modes, as they are located in relation to each other within the specific action that social actors perform (Norris, 2014: 92). Modal density consists of what Norris calls either modal intensity or modal complexity (Norris, 2014: 90). Modal intensity is a term for what happens when a specific mode plays a central role in an action, such as spoken language when making a telephone call. Modal complexity is a term relating to using many different communicative modes of action (Norris, 2014: 90).

Methodology

This study is placed within visual ethnography where video is used as an ethnographic method. I did video observation of five 4th grade classes (10–11 years old) working with film production for a period of three weeks in each class. In all I have 66 hours of video data, field notes and informal interviews with pupils and teachers. I draw on the approach of multimodal interactional analysis, which places considerable emphasis on the notion of context and situated interaction. "Social actors always co-construct their actions with the environment and/or with other social actors so that we can never extricate a social actor's actions from the environment and/or from the other social actors involved" (Norris, 2014: 88). By applying this approach to the case of my unit, I seek to understand how pupils act and make meaning together in a group when working with film production on iPads. As Jewitt writes about this approach: "This serves to shift the emphasis from mapping the modal resources used in a general sense to understanding modes in action, and the hierarchical and non-hierarchical structures that can be found among the modes used in specific social interaction" (Jewitt, 2014: 38). Talk is not sufficient when these young children are learning through film production because they are not familiar with film terms or film grammar. Therefore, the often use body language to express new ideas to other group members. Embodied interaction is central to children's collaborative learning through film production, which is why we need the

approach of multimodal interactional analysis to understand this multimodal composing practice.

I have done multimodal transcription using the program ELAN. First, I transcribed their talk and then I transcribed each child's lower-level actions, focusing on the communicative modes of head movement, gaze and gesture with a focus on arm movement and hand movement. This approach is quite comprehensive and is even more complete in this study because there are multiple people in the video data, which are collected with a handheld video camera. This was necessary because the children were moving around in a big area.

Results

Modal intensity: Touch

It became obvious when viewing my video data that there is a common movement pattern when the children are making films on iPads. Immediately after a group has completed one recording, the entire group moves behind the screen to watch the footage, reflect on the scene and possibly do some editing. Their eyes are on the screen and, when the recording stops, the children look up and discuss whether or not they will keep the recording or make a new one. They touch the screen to tap and drag in the app iMovie, and sometimes they get into a fight about who will hold the iPad. We see children pulling on the iPad and turning their backs to other group members in order to gain control of the iPad themselves. Through micro-analyses based

on the approach of multimodal interactional analyses it became clear that the children's filmmaking is a collaborative composing practice, where the communicative mode of touch is essential to collaborative learning practice and the final film product. Modal density is represented by modal intensity, which consists of touch. This tells us that touching is an indispensable part of children's collaborative learning through film production when it concerns new media technology. Gesture and touch must be considered as important communicative tools for students working with digital technology (Walsh and Simpson, 2014:96). Now let us look closer at lower-level actions through multimodal transcription to see how touch is represented in a chain of actions in the group's collaboration to reflect on a scene.

Multimodal transcription

This mediated action is chosen because it represents a general way of making a film when it concerns this specific group. This example consists of a higher-level action in which the group is reflecting on a scene they just have recorded and watched. The scene they have recorded challenges them and they have tried several times to record it without being satisfied. Figure 1 illustrates key frames from the multimodal transcription as highlighted below.

(1) 00:23:01.950   (2) 00:23:03.050

Figure 1: Excerpts from the multimodal transcription

(3) 00:23:09.000   (4) 00:23:09.041

This higher-level action begins with a comment from girl 1: "It's impossible to hear it and it's really bad. We cut it off" (00:22:57.062). This comment starts a chain of actions. Boy 1 moves backwards and out of the frame. This can be interpreted as a response to girl 1's comment. He accepts that she finds the filming bad and wants to edit it, which is why he gets ready to film the next scene. Girl 2 turns her head to the left and looks at girl 1 as she makes her comment, then she looks back at the iPad again. Maintaining his gaze at the iPad, boy 2 stretches his right arm forward to touch the screen with his forefinger, as he says: "One more time" (00:23:00.560). His right forefinger just reaches to touch the screen in the lower-left corner on which there is written: "Record again"[2]. Girl 2 reacts to this action by saying out loud "NO" (00:23:01.672), and with her left hand she grabs his right wrist and pulls his hand away from the screen (Fig. 1, picture 1). Meanwhile she stretches her right arm forward to touch the lower-right corner of the screen on which is written: "Use video"[3] (Fig 1, picture 2). Her attempt to keep the footage does not succeed. In the meantime, girl 1 steps into the picture again from the right and rushes

to the iPad. She leans forward to look at the screen and says: "No just cut it off" (00:23:02.090). The other girl, girl 2, takes back her right arm and says "No" again, adding the boy's name in a resigned tone. Also, girl 1 tries to save the footage by tapping "Use video", but realises it is too late because the boy has deleted it (Fig 1, picture 3). Boy 2 reacts to the girls' discontent by bowing his head and staring down at a piece of a toy he is playing with on the table. He says: "What! It's much better" (00:23:03.920). Then he looks up at the screen, but quickly turn his gaze down again. Meanwhile, girl 2 says: "No we don't want to film the same scene all the time, all these 'food scenes'" (00:23:05.507), while turning her head away from the boy. Girl 1 also turns away from the boy, waving her right hand making a statement of irritation (Fig. 1, picture 4). She walks away, out of the frame (00:23:06.880). Now it is only boy 2 whom we can see in this picture. He looks at the iPad and says: "Let's just take it one more time" (00:23:09.041) and moves both arms toward the iPad to keep hold of it. Out of shot we hear girl 2 make a comment in a stressed tone: "We have 40 minutes" (00:23:11.680), which boy 2 reacts to by saying "No" and looking at her

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[2] Translated from the Danish version of iMovie on which there is written "Tag igen".

[3] Translated from the Danish version of iMovie on which there is written "Brug video".

(00:23:14.681). There seems to be an intense atmosphere and girl 1 (out of the picture) says: "Come on. Fine" (00:23:14.684), which is overlapped by girl 2's response to the boy: "Yes we have", referring to their discussion about the time they have left. Straight away, boy 2 turns his head to the iPad again and starts counting: " OKAY. THREE, TWO, ONE." This last comment marks the end of this higher-level action.

Conclusion: One single touch creates a conflict

This higher-level action shows that touch as a communicative mode is essential for the children's collaborative learning through film production. A single touch creates a conflict in the group and tapping on the screen makes it possible to make radical changes to the film, which has big consequences for the film's outcome. By not arriving at a consensus within the group to delete the filming, it also has big consequences for the group's collaboration. These findings indicate that the affordances of iMovie and iPad make available new or newly configured multimodal resources, which affect how pupils collaborate and produce meaning in film-production practice. Today, it is possible, through the collaborative mode of touch, to film, watch and edit a film on the same device. The timeline in iMovie whereby film clips are imported gives children the opportunity to see their film clips stored as one long film. This is I believe essential for a child's way of thinking about film production. By touching (tapping and dragging) the screen they experiment with editing (in this example deleting) the film in-between filming scenes. For teachers, this knowledge is of great importance as a basis for planning their teaching with and about film production using new media technologies. In the bigger picture, it is useful knowledge when planning multimodal teaching of new media technologies.

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Digital childhood, risks and opportunities: Why is it so important to listen to children?

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Abstract

This article explores how children construct their own cultures through the use of digital technologies and, based on these specific sociocultural codes, how they reflect and position themselves with respect to risk and opportunity discourses. It addresses the crucial challenge of listening to children's voices and understanding their interests and needs, with regard to the apparent problems and benefits associated with digital practices. This approach exposes the limits and paradoxes these discourses may hold for children, thus highlighting the need for them to be actively involved in research and decision-making. In contrast to the narrow focus on essentialist, sensationalist and adult-driven perspectives, this work offers a broader and more contextualised approach. This analysis is based on an ethnographic study with fourteen girls and eight boys. They were aged between nine and fourteen years and were engaged in three different settings: after-school centres, family homes and digital inclusion centres. Data were submitted to thematic analysis.

Keywords: Digital cultures, children's perspectives, children's voices, risks, opportunities

Introduction

Thunder is a 12-year-old girl who loves socialising and is constantly communicating with her friends. After school, tools such as Facebook, Messenger, Skype and a mobile phone enable her to keep in touch with her friends. Each of these tools serves different purposes: Messenger is 'small and cozy', ideal for a private conversations with close girlfriends; 'anyone can listen to a Skype call', making it suitable for group hang-outs; with Facebook's sharing features come chatting, small talk and peeking at friends' lives; text messages permit constant interaction with her closest friends. Despite the enthusiasm surrounding these possibilities, they are not referenced without certain worries. Thunder likes checking and commenting on her friends' photos, as well as sharing her own; she also savours the popularity and social acceptance underpinning these

interactions. But she does not want her life to be exposed, her time absorbed or her safety compromised. Thus, she endeavours to follow safety rules and she reassures her parents that she continues to focus on school duties and relevant leisure activities, such as reading.

Drawing on the voices of young girls and boys like Thunder, this paper argues that children, in this case 9 to 14-year-olds, construct their own cultures through the use of digital technologies and reinterpret discourses of risk and opportunity in accordance with their knowledge, values and perception of norms developed within peer groups. This work explores these specific sociocultural codes and how they are constructed in the context of children's digital practices. It further considers how children reflect and position themselves with respect to the risk and opportunity discourses surrounding these experiences. This analysis points to the need to reconsider the dichotomy between 'risk' and 'opportunity' that has come to dominate many of the debate and awareness approaches. It concludes by arguing that these concepts are not very helpful if we want to understand children's own perspectives and how they choose to deal with the many challenges of being active online.

Based on sociological approaches to childhood studies (Prout, 2005, 2011), as well as social constructionist perspectives on technological development (Lievrouw & Livingstone, 2006), this study offers an alternative perspective to the narrow emphasis arising from sensationalist accounts of risk and opportunity. Adopting a broader, less adult-driven perspective, it focuses on how digital practices operate in children's everyday lives, where specific sociocultural codes, demands and meanings emerge. The results of this analysis express a more nuanced and contextualised approach, emphasising the need to respect children's own perceptions of the apparent problems and opportunities brought about by digital technologies, and the need for children to be more involved in the decision-making process.

Research context

Research about children's digital media uses has greatly increased in recent years, generally portraying them as highly motivated cybernauts who rely on technology at ever younger ages and for a significant if not major part of their play, learning and social connections (Holloway, Green & Livingstone, 2013; Ito et al., 2010; Livingstone, Haddon & Gorzig, 2012; Livingstone & Haddon, 2009). Moreover, children's own perspectives gain visibility, through approaches considering them as active, competent social agents and media audiences (Buckingham, 1993b, 2007a; Livingstone, 2002). Notwithstanding, in the case of opportunity and risk agendas, research focusing on how these uses operate on the ground, in specific sociocultural settings and circumstances (Buckingham, 2008a; Ito et al., 2010), is still relatively scarce. Growing around discourses that proclaim digital

technologies' wonders and pitfalls (Postman, 1994; Tapscott, 1999), research more or less disregards how these top-down, dichotomised perspectives are at odds with children's everyday practices and challenges (Davies, Bhullar & Dowty, 2011; Withers & Sheldon, 2008). As child-centred approaches to these issues suggest (Barra, 2004; Bragg, Buckingham, Russell & Willett, 2011; Buckingham & Bragg, 2004; Buckingham & Sefton-Green, 2003; Buckingham, 1993a; Burn & Willett, 2004; Sefton-Green & Willett, 2003), children's experiences hardly convene such structured approaches.

Against this background, this article focuses on children's lived experiences of using digital media and the reinterpretations of opportunity, risk and safety that emerge within specific sociocultural contexts. Drawing on a cultural-sociological perspective, it looks beyond the binary opposition between opportunity and risk as well as the sensationalist and over-generalised views of children's digital practices. It considers how extending our knowledge of how digital experiences operate in specific contexts and cultural backgrounds demystifies the deterministic and generalised notions of a digital generation or a corrupted childhood (Buckingham, 2000), as well as the dualistic representations of opportunity and risk, portraying them as independent concepts and practices. Hence, it offers a more nuanced and deeper understanding of children's digital cultures and the challenges that emerge from this alternative research perspective, namely, in relation to what

might be considered positive and risky.

This approach further considers the emergence of a bedroom culture and the role new media play in this context (Bovill & Livingstone, 2001; Livingstone, 2007b). As outside spaces are perceived as risky and media are becoming cheaper and more portable, are children's leisure and social activities retreating to the home, especially the bedroom, by means of the private and connected adoption of digital spaces? Boyd's notion of networked public spaces, to which common practices such as chatting, gossiping or flirting are transferred, reflects this connectivity from within the bedroom. Authors further highlight the opportunities, as well as risks, afforded by networked publics, considering, among other characteristics, their persistence, search ability, replicability, invisible audiences (Boyd, 2007) and global reach (Livingstone & Haddon, 2009), among others.

This research also reflects on how childhood has come to be recognised as a social construct and children as active social actors, who construct their own cultures. Notwithstanding, it echoes the calls for an interdisciplinary (Prout, 2005, 2011) and relational (Tisdall & Punch, 2012) approach to the study of children and childhood. Like Prout (2005, 2011), this study highlights childhood, and adulthood or society for that matter, as a complex hybrid of nature and culture. It also explores theories of the social construction of technology to reflect on how technology and social practices co-construct each

other (Lievrouw & Livingstone, 2006). Recognising technologies as socially meaningful phenomena, research must explore the complex relationship between agency and structure, avoiding essentialist pitfalls. As Hutchby (2001) proposes, recalling Gibson's (1979) concept of affordances, understanding technologies as artefacts evidences how they both shape and are shaped by social practices. This approach refutes the media effects model (Livingstone, 1996, 2007a), focusing rather on the social, cultural and historic circumstances in which a medium is adopted in a particular way.

Considering these approaches, both childhood and technology are considered complex and hybrid concepts and phenomena, rather than fixed entities, despite their structural dimensions. This explains why media and technology were used within this research without clear conceptual distinctions. While one more often pertains to media studies, the other appears more in educational research, these are two academic areas that mingle when studying the subject of children's digital cultures. Nonetheless, as applied here, both generally refer to the media children use or the technological environments they inhabit, emphasising that what matters most, in this type of analysis, is how children represent and adopt them. A similar premise applies to the concept of child, it is used even though some participants are up to 14 years of age. Considering the length of the study, childhood and youth, understood as specific age intervals and developmental

stages, intersected each other throughout its course. The concept of child prevailed, taking into account the project's academic field, Childhood Studies, as well as the ages of the majority of participants. Notwithstanding, in considering how identities are built in or through media uses, this is also a study of how children or young people come to consider themselves as such through their digital practices.

Methods

This research involved 14 girls and eight boys, from nine to 14 years old. Fieldwork took place in three phases, each in a distinct setting. Held in two after-school centres, the first phase (February to November, 2009) comprised group sessions, games, debates around graphic and audio-visual materials, role-playing exercises and participant observation. These were used to debate and participate in children's digital uses and considerations about opportunity and risk. Considering how much easier it was for participants to express points of view and to describe their experiences during unstructured online sessions, used mainly to play games and to access the avatar-based chatroom Habbo Hotel, the second phase (February to November, 2011) relied almost exclusively on participant observation. The same children participated in individual and group encounters, these taking place in family homes and one of the after-school centres. These were complemented by three open-ended interviews. The third phase (October, 2011 to March, 2012) focused on children

involved in social and digital inclusion projects, based in three digital inclusion centres. Six new participants joined the project, being involved in participant observation sessions, four multimedia projects and two open-ended interviews.

This methodological approach was informed by what is described in the literature as working with children (Alderson, 1995; Christensen & James, 2000; Lewis & Lindsay, 2000; Lobe, Simões & Zaman, 2009). Developed within the theoretical framework of new sociology of childhood (James & Prout, 1997), it aims to include children in the research design. This works as a means to access and understand their own social and cultural worlds, as well as offering opportunities for their active participation in research and policy that affect their lives. Its basic premises can be defined as follows: children's capability to perform and share their own cultural expression requires a child-friendly methodological approach which, taking into account their singularities as a social group with specific backgrounds and living conditions, is only definable by children themselves; children's active participation brings their own agendas and concerns through to research, thus including them in how their lives are represented and dealt with institutionally (Kirby, 2004). In spite of the inevitable differences between them, one of the main goals is for the researcher to find a way or a place to experience children's cultures. In this respect, notwithstanding the centrality of ethnographic methods (James & Prout, 1997), participative methodologies have

gained wide visibility (Alderson, 1995).

Registered in field notes and fully transcribed audio and video recordings, data were submitted to thematic analysis. Following Braun and Clarke's (2006) understanding, this was considered to be a method in its own right, rather than a mere tool, despite its similarities to other approaches, such as grounded theory and discourse analysis. Using qualitative analysis software, NVivo, data were reduced and organised as three main themes: contexts, uses/ objectives and problems, 13 categories and 15 sub-codes. Nevertheless, as Eglington (2013) mentions, coding remained open, as analysis continued through representation, i.e while writing up the research. Hence, meanings were explored mostly at the writing stage, with new connections and 'interpretative possibilities' (ibid., 202) emerging, mirroring Wolcott's understanding of interpretation as both the start and end point of ethnographic research. Therefore, this project offers a situated and relational perspective of children's use of new technologies and processes for constructing meaning. This emphasises the socially constructed nature of identities, relationships and beliefs and how these are performed in relation to the specific cultural, social and linguistic backgrounds in which they are lived.

This methodological design is also motivated by strong ethical concerns. It aims to promote children's participation in knowledge production and use, thus counterbalancing the tendency to

underestimate their capacity to reflect, decide and contribute to society, as well as the importance of their involvement. In this sense, it explores the idea that participation issues are 'keystones' for the promotion of children's rights, namely with regard to the process of interpreting and putting them into practice (Willow, 2002). This perspective steers clear of adult-centric, decontextualised principles, in order to concentrate on children's own cultural expressions and concurrent ethical reinterpretations. In practice, this entails going beyond predefined protocols to reflect continuously on how methods do in fact address children's concerns and perspectives, with regard to the topic under study, specific ethical issues emerging and how they intertwine with each other. This reflexivity posture further assumes that social research, particularly with children, is a shifting process, subject to a vast array of contextual contingencies. When established a priori, ethical commitments may fall short of contending with the ever-changing nature of social-research sets.

Results

Identity and sociability

From a sociological perspective, this study seeks to understand how children build their own sociocultural worlds through the use of digital technologies. In this sense, technologies are not only entertainment tools but also social spaces in which identity and a sense of belonging develop. Among other aspects, the research notes how children and youths represent themselves through their use of new media, generate and manage relationships, establish social hierarchies, negotiate norms and social expectations (Almeida, Delicado & Alves, 2010; Almeida, Delicado, Alves & Carvalho, 2011; Boyd, 2014; Buckingham, 2008b; S. Holloway & Valentine, 2003; Ito et al., 2010). These techno-social arenas become what Ito and Bittanti (2010), referring to games, describe as a lingua franca for digital participation. Lollipop (girl, aged 14) conveys this when, understanding that one of the younger girls does not have a Facebook account, says: 'Oh, you poor thing.'

In this study, these dimensions emerged in gaming, social networking and text messaging. Despite its important role as a leisure activity, gaming is also a social practice through which identity, reputation and social status are defined within the peer group. This is akin to a high level of competitiveness, achieved not only in terms of winning but also through the competences and strategic choices one is able to use and make. On the other hand, competitiveness does not stand for rivalry, it overlaps with co-operation. It is important to win but only if there is fair play. These uses were typical in groups of boys and their use of the social games that Facebook hosts, but not exclusively so. Some of the girls participating in this study entered into this type of competition. On the other hand, this was also performed through games that do not have social features. The following excerpt exemplifies these meanings:

Researcher: *When we talked last year I heard you say that you like games because they cheer you up.*

Frize (boy, aged 12): *Ah!*

Researcher: *Ah, now I think you enjoy competing, seeing who is the best player or who wins!*

Xerife (boy, aged 12): *I only play for distraction. Sometimes.*

Researcher: *Is it? I heard you say, for several times, I have this monster and you don't!*

Frize: *Right Xerife?*

Researcher [similing]: *Or, let's make a race to see who wins.*

Xerife: I did [won].

The majority of girls preferred using Facebook, investing a lot of time in sharing photos and 'talking' through online comments. Posting a photo often initiates what some participants referred to as 'talk', meaning the continuous exchange of comments about what a photo portrays, made through Facebook's comment button. A person's physical attributes or personality traits, peer relations and recollections of past events are the main themes. These interactions underpin a series of social norms and commitments, through which social relationships and hierarchies emerge. Having a great number of comments and compliments represents a competitive edge. As one of the girls mentioned:

Lol (girl, aged 12): *Whenever I open Hi5*

I always have something, even if it is only one comment (…) I like Hi5 because I like to know what people think about me.

Debating the idea that it is safer to have pictures from celebrities or animals in your online profile, she continues:

Lol: Imagine I have a photo from a famous singer in my profile and someone says you are beautiful. It means nothing! It has to be about me, with images and statements that say something about me.

Boys take part in these interactions but mostly by posting comments, not photos.

Considering the specific norms created, participants highlight, with regard to social networking, the importance of: i) having an updated profile, not necessarily containing a great number of portraits but recent ones, where the person is easily identifiable; ii) making positive comments about friends' pictures; iii) thanking others and replying to those left about one's own portraits. Different expressions allude to these rules:

Thunder (girl, aged 12): *I hate it when someone sends you a friend request with no picture.*

Lol (girl, aged 12): *We have to reply. If someone leaves you a comment you have to comment back.*

In the gaming context, collaboration and fair play prevail. It could also be deemed transgressive to share and comment on photos. As one of the boys asserts:

Xerife (boy, aged 12): *Comments! Are*

you kidding me? I have more important things to do.

Digital participation also requires intense use of digital media. If one is to remain competitive in games or participate in Facebook talk, time spent online is of the essence. Moreover, more time represents a competitive edge, standing for training in games and prompt responses on Facebook. In this regard, it is important to join in a conversation but also to do so while it remains up-to-date. Although little explored in this study, the use of mobile phones fits this type of interaction, allowing the continuous sharing of experiences or novelties about what is going on with each other and in the group. Text messaging about new photos published on Facebook exemplifies this practice:

> Thunder (girl, aged 12): *They keep telling [texting] me, you have to leave me a comment! But I keep forgetting.*

The interactions described so far sustain children's close social relationships. Children relish how communication technologies allow them to meet new people who share common interests. These were, in this study, related to specific games. Nevertheless, it is in the context of their close social connections, established together with the school culture, that media use becomes more intense and significant. These social ties are defined, weakened or strengthened by interactions mediated by new technologies. Lol exemplifies this as she recalls sharing a password with a friend in order for her to update her profile's visual appearance. Later, after a quarrel, she

decided to change the password, qualifying this as a close-friend privilege. Types and levels of friendship are expressed and co-constructed online:

> Lol (girl, aged 12): *You can't say that [friendly nickname], that's just something we use between each other.*

The link between digital and school culture reflects how digital participation is actually closely related to offline experiences, and vice versa. Children's experiences are continuously and mutually reconstructed from face-to-face and online interactions. Although occurring offline, events such as a sports championship, a quarrel between friends or a field trip continue to be matters for discussion relating to photographs and comments shared through social networks. On the other hand, a new music clip appearing on YouTube, a game strategy, a profile picture or comment are topics of conversation during school breaks, as Lol describes:

> Lol (girls, aged 12): *They [boys] talk about it all the time. They leave the classroom and immediately start discussing Facebook, Friville, Farmville or whatever.*

In this sense, concepts such as digital and online do not express the interrelationship between virtual and non-virtual contexts, thus these frequently appear, in this project, in parentheses.

Online problems

In its attempt to understand the problems

children encounter through their digital practices, this study identifies three thematic areas: identity and sociability; risk and safety; access and use conditions. Of these, issues related to social belonging, reputation and relationships are of greater concern. Given the social commitments and norms established in the context of digital participation, children worry about meeting social expectations, namely, what it entails in terms of time spent online. As mentioned, actual participation requires intense use, a sine qua non condition for those who wish to succeed in games or build a solid Facebook presence. This is not always easy to manage or, when not accessible, to justify, as Astérix debates:

Astérix (boy, aged 11): *I can't pass to the next level.*

Frize (boy, aged 11): *So weak.*

Astérix: *It's not my fault that my hands are small.*

Frize: *Come on, you're weak.*

Astérix: I*t's not my fault that you're older than me.*

Moreover, age and gender comprise specific social expectations. Participants expressed how older boys and girls are expected to prefer social networking and younger boys gaming:

Thunder (girl, aged 12): *They [boys] like gaming as well as social networking, but dedicate more time to games.*

Xerife (boy, aged 12) [after one of the boys disclosed having played Stardoll, a

fashion game]: *Don't tell anyone I'm your friend.*

Tip (boy, 14): *They [younger boys] don't do anything else besides gaming. I don't use computers to play games.*

On a distinct level, adults' expectations are redirected to formal education, health and safety issues. In effect, children specifically try to distance themselves from a pathological representation of the Internet addict, seen as someone who neglects school work, friendships and meals to spend time online. Participants endeavoured to ensure they were using or would start to use the computer for less and less time and for school work exclusively. This was also the case for children whose commitment and enthusiasm towards online social and entertainment experiences were visible and corroborated by peers and educators. Contacting strangers and sexting were also considered typical addict practices and equally denied. In short, children resent this Internet addict stereotype:

Thunder (girl, aged 12): *My parents' and sister's theory is that there were no computers when they were young, they did nothing of this sort, as I do nothing else. But that's not true, sometimes I just don't feel like going out, it's not because of the computer itself.*

Regarding new time restrictions being imposed, she warned her peers:

Thunder: *I already told my friends I won't be 'skyping' so often. I will start to go*

out more.

Therefore, peer and family arenas conflict with each other, as one demands intense participation and the other detachment. Furthermore, peer culture is exercised through social networks and gaming platforms, tools that, from an adult-centric perspective, lack educational value. In this context, identity performance (Buckingham, 2008b) emerges as a coping strategy, making it possible to adhere to both standards. Notwithstanding, being one the most enthusiastic Facebook users of this group, Thunder stresses:

> Thunder (girl, aged 12): *All you do in Facebook is pry into other people's lives. I normally say, I just want Facebook to be in touch with distant family. Well, also because I like it, although it's boring sometimes and I prefer doing something else.*

Mirroring the distinct identities and cultural values assumed, specific concepts take on distinct meanings. Children frequently mentioned being addicted to specific digital technologies, referring to their preferred activities, in a cultural, non-pathologic conceptualisation:

> Bubbles (girl, aged 12): *I was addicted to that game. When I had to stop I stopped, but I enjoyed it very much.*

A similar approach is adopted to the concept of a stranger, which does not include one's 'friends' friends' or one's partners in social games:

> Keys (girl, aged 12): *He is not my friend, he is my friend in the game.*

Xerife (boy, aged 12): *I just ask for game stuff, I don't talk with him. In fact, he only speaks English.*

Finally, personal data refers to name, address and mobile number, rather than the living experiences shared through social networks.

Risk and opportunity

Children worry about safety issues but awareness strategies are challenged by the conceptual ambiguity referred to, specifically who is considered a stranger or what is deemed addictive behaviour. On the other hand, stereotyped images of risk and online-offline interconnectedness prevail. 'Stranger danger' specifically relates to girls who accept older men as friends, engaging in dangerous relationships and, eventually, arranging face-to-face encounters. Deceived by a friend about the identity of an alleged cousin that she was supposed to introduce, Thunder demonstrates how this representation differs from children's daily experiences:

> Thunder (girl, aged 12): *We didn't know if it was true [really a cousin], we believed her, we thought we could trust him because he was her friend.*

Risk was also considered a boring concept that children would rather not talk about. For example, when I raised this theme, Bubbles grumbled:

> Bubbles (girl, aged 12): *What can I say about risk, the same all over again?*

Based on this stereotypical representation, children see themselves as informed and competent with regard to online risk. For example, when debating the hypothesis of being at risk, participants replied:

> Keys (girl, aged 12): *Only if I accept strangers as friends and start talking to them.*

> Sir X (boy, aged 14): *Well, you only go there [porn websites] if you want.* Thunder (girl, aged 12): *You choose who to add as a friend.*

Thus, engaging in risky experiences becomes a matter of free and moral will, with consequences for which one has only oneself to blame. Despite encouraging a sense of responsibility, this also creates barriers for support and learning, emphasising a culture of blame and stigmatisation of children involved in experiences of risk. Furthermore, specific uses have to be concealed, as Safira demonstrates when discussing a chat she had, in the presence of the researcher, with an older man through Facebook:

> Safira (girl, 10): *I know all my Facebook friends. Well, almost all. But I don´t talk to strangers that much, I'm not one of those [girls]. Look, this here is my cousin.*

In short, moral judgements about risk experiences block children from generalised access to support and learning networks.

Finally, in stressing issues related to relationships, social commitments and entertainment, children consider their digital practices as modes of participation in peer

cultures (or just living), rather than opportunities. In fact, this stands as a meaningless concept, on the one hand considering how it never comes about spontaneously in children's discourses, on the other the way in which it is superimposed by the concept of risk. Stressing educational benefits rather than children´s rights to leisure and identity (Buckingham, 2007b, 2008b), opportunity might more properly be considered an adult-centric construct, distant from children's agendas and status as social actors in their own right. Thus, opportunity relates best to the tendency to consider children as 'becomings', i.e. immature beings who exist with the purpose of preparing themselves for a better future. In contrast, conceiving children as 'beings' emphasises their present lives as part of the family, school or, more widely, the world they inhabit (Prout, 2011).

Discussion and recommendations

Based on children's accounts and daily digital practices, this project deepens our understanding of the central role new technologies play in their lives. Adding to other child-based approaches, it depicts technological spaces as important social arenas, where peer group integration takes place (Boyd, 2014; Ito et al., 2010). It further illustrates specific personal and social identity negotiations, exposing how these relate to the amount of time children dedicate to the use of technologies. This study also witnesses how 'real' and 'virtual' mingle in the course of social interactions

and friendship-building, hence corroborating the idea that online and offline interconnect in complex and even undistinguishable ways. Against this background, it is to be expected that we might identify problems related to identity and sociability as children's greatest concerns. The examples this study provides show the extent to which children worry about responding to specific social commitments and expectations that emerge within their own 'digital' cultures, including gendered and maturity related standards.

With regard to perspectives of risk, the findings raise concerns at several levels. Risk-related experiences and concepts assumed polysemic meanings, with semantic adaptations emerging with the purpose of maintaining harmony between the family's and peers' conflictive agendas. With one praising detachment from practices not related to formal education and the other pushing towards intensive online presence, striking a balance is difficult, with children often resorting to identity-performance strategies. Simultaneously, an overall simplified and even stereotyped image of risk prevailed in participants' discourses, based primarily on sensationalist stories. In light of moral judgements addressed towards children involved in experiences such as arranging encounters with strangers, sexting, addiction and accessing pornography, participants' restricted danger to a set of particular scenarios. The concept of opportunity seems similarly at odds with children's cultures and perspectives. It was

not part of the participants' 'digital' lexicon, rather it corresponded to parents' concerns about cognitive development and school-related achievements.

It is important to highlight how this creates artificial conditions for children to consider themselves informed and competent with regard to their digital practices. Indeed, despite polysemic meanings, participants' projected a self-image of capability, worthy of adults' trust. Adopting this viewpoint allowed participants to feel both safeguarded from potential parental punitive measures as well as more able to meet their peers' demands. Nonetheless, in addition to diminishing awareness of other, more complex and subtle experiences, this viewpoint stimulates a culture of blame and stigmatisation of children involved in experiences of risk. If one knows what danger looks like and what to do to avoid it, engaging in such experiences becomes a matter of free and moral will. While possibly encouraging a sense of responsibility, this also inhibits children's access to support.

Overall, these results provide insightful examples of what goes on in children's worlds, from the point of view of contexts of practice that only they know. In spite of the inevitable epistemological and methodological challenges of trying to participate in and understand children's worlds from the inside (Christensen & James, 2000), these constitute an extensive and thoughtful depiction of the knowledge and awareness that may result from listening to children and empathetically trying to comprehend their 'side of the

story'. As such, this study highlights the importance of recognizing the validity and significance of children's differentiated ways of seeing, interpreting and co-creating the everyday worlds they inhabit, namely their cultures, expectations and compromises. Moreover, this research illustrates and discusses what a child-centred research approach may look like, through a naturalistic and interpretative lens. In short, this constitutes an important contribution towards integrating this differentiated approach in the way we deal with these issues.

In light of these results, it seems to be urgent to highlight and reflect on the myriad forms and meanings that digital practices assume, from the point of view of children and the everyday settings, possibilities and contingencies they live and grow up in. This analytical angle is crucial if we are to comprehend and address these issues in a manner that makes sense to children and considers their own concerns. It is, furthermore, essential to provide children with space, time and personalised support to freely explore, make sense of and take decisions regarding the specific technologies present in their day-to-day lives and how this connects with peer cultures and wider sociocultural backgrounds. As such, it emphasises the need to and advantages of considering children's own perceptions and involving them in the decision-making process.

In brief, this project gives some in-depth details and consistency about the following central ideas: i) it is of utmost importance to accept that, although not exclusively, children live and grow up through digital practices, thus needing space, time and support to learn how to perform them; ii) technology plays a key role in personal and social-identity building, namely through friendship relationships, with relevant commitments established between peers depending on the use of technology to be fulfilled; in practice, this points to the relevance of allowing children to participate in the definition of access and use rules, in family and school environments, thus promoting balance between peer and family agendas; iii) a division between 'real' and 'virtual' is artificial, as they continuously interweave and reframe each other – 'virtual' is 'real', and vice versa; iv) assuming that opportunities go beyond formal education brings us closer to children's worlds and to acknowledging the merit of their digital practices; vi) universal restrictions are not effective (Livingstone et al., 2012); vii) it is preferable and more effective to take an interest in and eventually set rules with regard to what children do and like rather than the time they dedicate to technology, in terms of safety, seizing potential benefits and diminishing conflicts.

Conclusion

The child-centred approach this project adopted offers challenging insights into the participation and safety issues children face when online. By not considering children´s digital cultures, measures aiming to benefit and protect them are at risk of being over-

prescriptive and stigmatising. These demand responses that may contradict children´s agendas and how digital practices occur in their daily lives, where specific sociocultural codes, demands and meanings emerge. Overall, awareness of these limits constitutes a warning about the dangers and ineffectiveness of impersonal and decontextualised strategies, supported by adult-driven agendas. Thus, this research calls for more contextualised approaches that are respectful of children's viewpoints and everyday lives, social and cultural contexts. The challenge is to uphold research and practice strategies capable of actually including children, their view and social and digital participation modes, as well as social and cultural contexts in which digital experiences gain meaning. Future research should explore how such a contextualised focus could be manageable, namely, how to promote children´s active participation in decisions affecting their digital environments, as well as parents' and caregivers' understanding and capacity to provide support when necessary.

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New literacy practices and teacher agency

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Introduction

This research in its entirety is reported in a doctoral thesis dissertation: Räisänen, S. (2015). Changing Literacy Practices: A Becoming of a New Teacher Agency. Acta Universitatis Ouluensis, E, 153. Oulu, Finland: University of Oulu. The aim of the research was to clarify what kind of a process 'doing things differently' in the context of new literacies (Leu et al., 2004) is from the perspective of teacher agency. The affordances (Gibson, 1977) of new literacies to learning have been topical in many literacy studies (e.g. Marsh, 2004, 2007; Merchant, 2005, 2008, 2012). These affordances should influence the development of learning opportunities and practices for pupils in schools (Kress, 2003; Marsh, 2007; Selander & Kress, 2010; see also Hakkarainen et al., 2004; New London Group, 1996). That is, educators should strive for change concerning not only the modes or contents of literacies, but also the structures of education in classroom communities. It seems though, that the change from traditional practices focusing on paper/ pencil activities and teacher-directed instruction to new kinds of social spaces is hard (Kist, 2005) and requires

Abstract

The research in its entirety is reported in a doctoral thesis: Räisänen, S. (2015). Changing Literacy Practices: A Becoming of a New Teacher Agency. The aim of the research was to clarify what kind of a process 'doing things differently' in the context of new literacies is from the perspective of teacher agency. It seems that the change from traditional practices focusing on paper/ pencil activities and teacher-directed instruction to new kinds of social spaces is hard and requires investment in the professional learning of teachers. The research offers such an example of a professional learning experience. The findings of the research show that the change in literacy practices was based on the choices the teacher-researcher made, creating in this way 'a style' for it. There were three main elements which characterized the change process: relativity, becoming and need for support.

Keywords: Literacy practices, new literacies, change, teacher agency, professional learning

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investment in the professional learning of teachers (Merchant, 2010). Thus, the teacher-agency perspective is essential in clarifying change. Educational changes, as well as the values according to which pupils work, much depend on teachers' actions (Fullan, 2007; Grenfell, 1998).

This research offers an example of a professional learning experience from a teacher-agency perspective. I, as a teacher-researcher, conducted development work on literacy practices in a Finnish first-grade classroom during one school year. The period involved new literacies-based practices with diversified texts and collaborative learning. My purpose was not only to challenge practices content and mode wise, but also to change the social structures of the classroom community towards more pupil-centred practices. These practices are highlighted in the Finnish Core Curriculums (National Board of Education, 2004, 2016). During the research process I learned though that my actions as a teacher considered not only change to practices in the classroom community, but also my inner, subjective experiences as a teacher. In the research I asked: What kinds of elements are embedded in the change process of literacy practices a) in the classroom community and b) in being a teacher?

Theoretical Framework

In a poststructural manner the theoretical concepts of the research were, in a way, 'thinking companions', which I discuss and have discussed within the context of and in different phases of or throughout the research. The concepts offered the tools needed for understanding the development process. The most important tool was Pierre Bourdieu's (1930–2002) concept of habitus as a 'structured and structuring structure' of principles generating and organizing practices, which constitute expectations for social practices, for individuals and their actions in a particular society (Bourdieu, 1977, 1990). When traditional, expected practices and new ones meet, tension and confusion are likely to occur. Therefore, making changes to practices, e.g. to a classroom community, involves tension and is hard for a teacher. Change may even drift and turn into the confusion of not knowing how to be or act (Hardy, 2012). Thus tension affects not only the practical level of teaching, because changes to practices always also influence the subjective level of personal processes (Lanas & Kiilakoski, 2013).

This research focused on studying the habitus of literacy practices in the social structures of a Finnish classroom community, where I as a teacher had the essential agency for change. The expectations, values, actions and beliefs produced by traditional Finnish school culture and society were expected to shape my agency and influence the way the development work progressed in the classroom community and in my own being. Everything that a teacher does or experiences speaks about teacher agency and positioning in that particular society. It was therefore important in this research to

investigate how I responded to 'doing things differently' within the social structure, both in classroom social actions and at my subjective level of being a teacher. Without processing both these levels, change to practices would not be completed (Kitchenham, 2008; Lanas & Kiilakoski, 2013; Larrivee, 2000; Mezirow, 1991).

Methodology

In the research I used Nexus Analysis (NA) (Scollon, 2001; Scollon & Scollon, 2004), an ethnographic methodological strategy, to study social actions in the classroom community from a teacher-agency perspective. NA aims to find ways to influence and change the nexus of practice – in the group being studied (Norris & Jones, 2005; Scollon & Scollon, 2004). That is, in this research, the nexus involved the community of a first-grade classroom with 18 pupils (ten boys and eight girls) and me as their teacher. The pupils and I produced the data. During development work in the classroom, I video-recorded literacy events throughout the school year, targeting different kinds of literacy activities in different places in the classroom (total 26 h 18 m). I also kept a diary, which consists of my notes about my experiences and observations of pupils' learning, activities and expressions (74 handwritten pages and a 45-page Word document). The video recordings and diary are the main data for investigating the research question at the level of the classroom community. Those instances, which involved tension between traditional practices and new ones,

constituted the units of analysis.

The data production and the development work did not, however, end simultaneously. The analysis of literacy practices in the classroom influenced my subjective experiences. When my doctoral-thesis supervisor and I were viewing the video data, I experienced the situation emotionally and became confused about my thoughts on literacy practices and being a teacher. The tension between new and the old practices became clearer. Thus, to make sense of my inner experience, I wrote a self-reflective text. This text works as data to answer the research question at the level of being a teacher. But the self-reflection does not only reach the subjective level of my emotions and thoughts, it also links the social structures, actions and relationships of the classroom community, and therefore mirrors the macro-level of the society. This self-reflection reflected even further in academic collaboration, by focusing on text units, which mirror my habitus as well as units which reflect literacy practices, and the interrelations between these two units. Two different ways of being a teacher, produced either by old or new practices, became the nexus (Scollon & Scollon, 2004) of the analysis at that point.

Findings

The process of 'doing things differently' became a reflective learning process for me. The teacher-dominated instruction was not changeable overnight to a pupil-centred learning space. My teacher agency during

the process was a balancing act between traditional practices and more creative learning. The research findings show that change to literacy practices was based on the choices I made as a teacher during this process, creating in this way 'a style' (Bourdieu, 1977) for it. I found my own way during the process, and therefore it is not possible to describe fully how to take a turn away from traditional literacy practices towards new ones (see Lankshear & Knobel, 2012). However, there are three main elements, which characterized the process: relativity, becoming and need for support.

The change process related to actions and relationships in the classroom community, connected to resources, to the field in question, to the pupils, to learning processes, to 'beings'. One cannot really separate the subjective and the objective from each other; for example, my actions cannot be understood without the classroom community and the classroom community cannot be understood without understanding my agency. The relation between the transformation in that agency and positioning can also be understood as a limitation. I acted according to the habitus of the moment and one cannot ever know what one's actions might lead to in the future. Thus, there is no point in asking whether my style is right or wrong, as one cannot really know about the reproduction of habitus. That is, changing practices is filled with uncertainty about actions and their influence, thus causing tension within teacher agency. This tension should, however, not be understood negatively but

rather as a passionate possibility, a chance to make decisions for better education. Enduring passion, an element of teacher agency, comprises forces for creating emancipatory possibilities in learning and teaching. Passion is always heading for something better – 'becoming' something that was not before.

Indeed, the 'becoming' characterized the whole change process. Fitting new practices into the habitus of a classroom community and being a teacher is a long, multi-layered and continuous process of 'becoming' (e.g. Kelchtermans & Hamilton, 2004). I was, during the research, in a state of continuous 'becoming' (Kelchtermans & Hamilton, 2004), both at the classroom community level and being a teacher aiming passionately for change. This process moved between 'inside and outside'. Change started on the inside, from my own interest in investing in change, and it continued on the outside, in organizing the classroom environment and implementing new practices. Then, the process returned to inside, to my subjective experiences of being a teacher. This learning process does not reach its end. 'Becoming' will always be part of educational change. And it is not only teacher agency which is 'becoming' and in a state of change –literacy concepts and practices develop perpetually. New evidence is produced for literacy practices and ways of working involving new possibilities for education. Thus practices transform and change shape, not to mention that literacies are not only in a process of transformation but also

transformative (e.g. Martin & Grudziecki, 2006). Literacies definitely transform us and create new choices for 'becoming'.

But it has to be understood that seeing passionate 'becoming' within a tension-filled change process is not easy. To challenge oneself as a teacher and to see change as a possibility for both professional and subjective learning is thus essential. A research-based approach to teaching supported me in reflecting on my learning process. Without support the change process could have been different from what it was. Indeed, teachers should be provided with support and safe spaces to learn from their experiences. Educational decision-makers should be aware of the struggle that teachers go through in changing practices to form new ones. This support should be offered at the professional-classroom community level, in teachers' own working places and as more personal support by offering teachers chances to reflect on their own being as a teacher. In addition, support has to be long-term, because the change process takes time. It perpetually raises questions about teacher-agency and the influence of actions. I have even questioned my motivation in implementing new practices and giving up my dominant position within the classroom community. Perhaps dividing up one's power in one field strengthens one's (dis)position in another? I may have had a double interest in the field of literacy education (Bourdieu, 1998). Did giving up my power in the classroom community improve my position as an academic and a literacy researcher, someone who tries to

achieve success in that field? Perhaps as a teacher I had the illusion of struggling for important things in that field, but as a researcher I wanted to see improvements in the area of literacy education. Or perhaps I simply reached a different kind of power position in the classroom.

It is therefore important to understand that change and implementing new literacy practices can only be a step towards a new kind of dominative relations. It may divide pupils (see Kist, 2005; Leu et al., 2009). New literacies may contribute to strengthening social inequality and increasing the gap between rich and poor. There is no equality in economic, cultural or social factors and these factors are embedded in people's practices (Marsh, 2005). Not all people have access to technologies or to (any kind of) education – some struggle with basic needs and the rights of a human being.

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Aspects of educational consciousness in early childhood media education

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Abstract

Various media are part of children's everyday lives in Finland. However, media education promoting media literacy has not been systematically included in early childhood education and care (ECEC). The need to enhance ECEC professionals' media education competencies has been acknowledged both nationally and internationally. This paper discusses media education from the viewpoint of ECEC goals and pedagogy. Educational consciousness is often considered to be an important variable steering educators' professional actions. Hence, this article scrutinises media education, drawing from aspects of educational consciousness constructed by Finnish educationist Hirsjärvi (1981). I present a model for media educational consciousness in institutional ECEC that has been constructed from research in the fields of media education and ECEC and complements Hirsjärvi's general model of educational consciousness. The underlying idea for the model is that early years media education should respect ECEC's elemental nature as a combination of education, pedagogy and care and follow the principles of ECEC pedagogies. The model presented should be further examined in empirical studies. It could be utilised, for example, to explore how ECEC professionals express their educational consciousness regarding media education or how professional texts, such as training materials or curricular guidance documents, promote media educational consciousness.

Introduction

Various media are part of children's everyday lives in the mediatised culture in which we live (Chaudron, 2015). In Finland, the need to promote media education (i.e. the pedagogical promotion of media literacy) has been brought up in the early childhood education and care (ECEC) context for more than ten years and has been supported by a variety of projects,

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publications and in-service training (Rantala, 2011; Ministry of Education and Culture [MoEC], 2013). Regardless of these efforts, surveys suggest that media education has not been systematically integrated into daily work in ECEC (MoEC, 2013). Also, the Finnish Higher Education Evaluation Council (Karila et al., 2013) has suggested that more research-based teaching of media education is necessary in university-level early childhood education degree programmes.

My PhD research aims to study what the gateways and barriers are for systematic media education in ECEC and how professionals' competencies are built in degree programmes, in-service training and everyday, practical work. Research on early childhood professionals' media education competencies is especially intriguing at present, with the Finnish core curriculum for pre-primary education being renewed and introduced in August 2016. For the first time, the core curriculum is normative in nature, and pre-primary education has only been mandatory for all six-years-olds since 2015, which means that all Finnish six year olds will be served by this curriculum and all pre-primary educational communities must have sufficient competencies to provide the education described in the curricular texts. The curriculum for pre-primary education includes transversal competency areas of 'multi-literacy' and 'information and communications technology' (ICT), clearly connected to media competencies and literacy. Producing and analysing media texts is also mentioned several times as a methodology for more general educational

goals, such as in ethical and arts education (Finnish National Board of Education [FNBE], 2014). Currently, the FNBE is also forming the first normative core curriculum for early childhood education (for 0 to 6 year-olds), which will be introduced in August 2017. Based on the latest drafts, this document will be closely linked to the pre-primary education curriculum, and 'multi-literacy' will also be included in the core curriculum of ECEC as a competence area that should be promoted through all pedagogical activities. Media literacy and ICT are included in multi-literacy. This guideline will be a major challenge for early childhood education providers, since only 8 per cent of leading municipal ECEC officers estimate that a majority (>80%) of their personnel are 'familiar' with media education (MoEC, 2013).

Now, it is essential to ask whether ECEC professionals' competencies in media education have kept pace with society's development in this area. Little academic research has been conducted regarding Finnish ECEC professionals' media educational competency development (Suoninen, 2008; Karila, et al., 2013). Thus, such knowledge is vital in meaningfully promoting early-years media literacy.

Theoretical framework

Defining 'media' has long been difficult, and accelerating media convergence is making it harder still (Masterman, 1987; Seppänen & Väliverronen, 2012). In this research study, media are discussed in a broad

sense, not only covering concrete equipment and content but also mediatised environments of communication (Meyrowizt, 1999; Seppänen & Väliverronen, 2012). All of these different aspects of media form media culture, the lifeworld of today's citizens.

Media education can be defined as 'goal-oriented interaction [...] involving the educator, the learner and media culture', as stated by Kupiainen and Sintonen (2009, 31). The goal of this interactive process is media literacy. While the extent and definitions of media literacy are ambiguous and continuously under debate (Palsa & Ruokamo, 2015; Potter, 2013; Martens, 2010), here the term covers not only the abilities to access, analyse, evaluate and communicate messages, but also participation, social abilities, self-expression and ethics (Kupiainen & Sintonen, 2009; Buckingham, 2007). Media literacy subsequently becomes a vast concept, but as Palsa and Ruokamo (2015) remind, the definition of media literacy should relate both to relevant theoretical discussion and the context in which research takes place, including its social and cultural characteristics. Contextualisation allows media literacy to be utilised in practice by clarifying its meaning. Hence, Kupiainen and Sintonen's (2009, 31) definition can be further contextualised for ECEC as follows: 'media education in institutional ECEC is goal-oriented interaction involving educators, learners and media culture. The aim is to promote ECEC's general educational goals by enhancing media literacy' (Mertala & Salomaa, 2016).

Media education can be carried out in various ways. No special skills are required by professionals in order to master media education. In our rapidly changing media culture, media education does not have, or even need to have, established pedagogical or didactic traditions or status as an independent subject. Thus, professionals' reasoning appears to be the key element affecting whether media education is included in ECEC pedagogies. Previous Finnish (school context) research (Vesterinen, 2011) implies that teachers' reasoning regarding media education does not fall easily into the common categories of (teacher) professionalism (e.g. subject or pedagogical knowledge). ECEC also differs notably from school pedagogies; it is a holistic combination of care, education and pedagogy. Additionally, only about one-third of Finnish ECEC professionals are teachers (Karila 2008). Therefore, this paper utilises the concept of 'media educational consciousness'.

The concept of educational consciousness, as examined by Finnish educationist Hirsjärvi (1981), and followed by e.g. Poikolainen (2002) and Tahvanainen (2002), refers to educators' awareness of playing the role of an educator and the rights and responsibilities involved in that role. In the field of media education, previous research and projects imply that confusion about the concept of media education and its highly technical connotations have been barriers to successfully including it in pedagogies (Kupiainen, Niinistö, Pohjola & Kotilainen, 2006; Mertala & Salomaa, 2016).

Methodology

This suggestion for a model of educational consciousness in early childhood media education (Salomaa, 2016) comprises studies in educational consciousness (Hirsjärvi, 1981), media education (e.g. Buckingham, 2007; Kupiainen & Sintonen, 2009), and media culture (Meyrowizt, 1999; Seppänen & Väliverronen, 2012). These theoretical cornerstones are scrutinised from the viewpoints of ECEC's values and general educational goals and based on both ECEC research (Broström 2006, Karila 2008) and the normative guidelines framing Finnish ECEC (FNBoE 2014, Varhaiskasvatuslaki, 2015). The methodology and theoretical framework are intertwined, since the suggested model builds the theoretical core for my PhD research and will later be tested with empirical data.

Preliminary findings and the next phase of the research

The underlying idea of the model is that early-years media education should respect ECEC's elemental nature as a combination of education, pedagogy and care and follow the principles of ECEC pedagogies. This would presumably make it easier to include media education in goal-oriented everyday ECEC pedagogies and practices and clarify the meaning of the concept within the field of early-years education. Hence, Hirsjärvi's (1981) general model of educational consciousness has evolved by contextualising it to (Finnish) ECEC and to the promotion of media literacy within a mediatised culture. The model suggests that media educational consciousness in ECEC includes four categories of conceptions, framed as follows (Table 1).

This model for media educational consciousness has multiple implications, not only for future research but also for practical educators and professionals working with ECEC degree programmes, in-service training and policies. It could be utilised, for example, to explore how ECEC professionals express their educational consciousness regarding media education or how professional texts, such as training materials or curricular guidance documents, promote media educational consciousness.

The next phase in the research is to study university-level kindergarten teacher-training programmes' curricula in order to learn how they are constructing pre-service teachers' media educational consciousness. What topics are covered in the courses and literature that should be enhancing pre-service early childhood education teachers' competencies in media education? Second, data will also be collected from practical educators, pre-service and in-service ECEC professionals, during the spring of 2017. This data set will include interviews and learning diaries from media education courses.

Table 1. Model for Media Educational Consciousness in ECEC (drawn from Hirsjärvi, 1981)

1. **Conceptions of ECEC goals and values in relation to media literacy**
   a. that are personal
   b. that are shared or at least negotiated with colleagues
   c. that are shared or at least negotiated with parents
   d. within the normative framework of professional ECEC

2. **Conceptions of adults' and children's growth and development**
   a. of individuals attending ECEC
      i. including the groups they form
   b. of the basic principles of human growth, development and learning
      i. as individuals and members of communities
   c. of human beings, especially children

3. **Conceptions of media**
   a. as a vessel
   b. as language
   c. as environment

   as media culture, a combination of all of the above; a lifeworld

4. **Conceptions of oneself as a media educator and the importance of ECEC for human growth in media culture**
   a. of oneself as a media educator and potential for development
   b. of the importance of educators' and children's interaction in the media cultural context: negotiation, control techniques, emotional aspects
   c. of the quality and importance of environmental factors and the interaction between different environments (material, social and cultural media environments)
      This area includes conceptions of how different environments, actions, situations, contents and materials affect growth and development

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Using Electronic Storybooks to Foster Word learning in Turkish Children[1]

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Abstract

A growing body of electronic storybooks, with different multimedia additions such as animation, background music and sound effects, has become available in online stores for an international community. The current study was designed to disentangle the effects of multimedia features that are rather common: animation on the one hand, music and sound effects on the other. Furthermore, we aimed to assess whether multimedia-enhanced stories that have been shown to facilitate word learning in other samples (Takacs, Swart & Bus, 2015) are similarly effective for Turkish children. A sample of 99 4- and 5-year-old kindergarten children were randomly assigned to one of five conditions: (1) animated stories with background music and sounds, (2) animated stories without background music and sounds, (3) stories with static illustrations and background music and sounds, (4) stories with static illustrations without background music and sounds and (5) a control group who did not listen to the stories. In the intervention conditions, two electronic storybooks were each presented twice. Preliminary results show cognitive overload from the electronic books. In contrast to previous studies, animated illustrations were not helpful in acquiring new word meanings and children gained more vocabulary in the conditions without music or sound. In particular, background music and sounds seem to interfere with Turkish children's learning. Possible explanations are discussed.

Keywords: Electronic storybooks, multimedia learning, vocabulary development, language development, cognitive overload

Introduction

Storybook reading is an important incentive for the cognitive development of young children. Each time children are exposed to a new storybook, they come across complex vocabulary and sentence structures which enhance their language ability and foster their vocabulary knowledge (Mol & Bus, 2011). Since we entered a new era of technology, storybooks have been going digital and online stores offer electronic storybooks. Just as in some Western European countries, such as Denmark, Sweden, the Netherlands and Belgium, which are defined as the most advanced digital economies in the EU (96% of households have Internet access; EU, 2015), there is a high proportion of households (70%) with Internet access in Turkey as well (TÜİK, 2015). We conducted a study to test the potential of digital storybooks for young Turkish children. While too much time on devices might mean problems for children (Christakis, Zimmerman, DiGiuseppe & McCarty, 2004), especially for those in countries like Turkey where parents are less aware of the benefits of early literacy activities such as shared storybook reading (Park, 2008) and reading performance is below the OECD average (OECD, 2012), electronic storybook exposure may become the most important mechanism for supporting emergent literacy skills. It is. however, unknown whether books available on the Internet are appropriately designed for children's comprehension and vocabulary development. In my dissertation project, I am experimenting with the role of music and sound effects on the one hand, and animated illustrations on the other, which are common features in electronic storybooks. I hypothesize that storybooks, including animations, background music and sounds effects as additional information sources in electronic books, may enhance young Turkish children's learning from them, just as these features help Dutch children (Verhallen et al., 2006). More specifically, music and sound effects were expected to help children understand emotions in stories, such as happiness, excitement and sadness, and thus support story comprehension. Preliminary results of the experiment regarding receptive word-learning are reported in the present study.

Theoretical framework

Based on the 'Cognitive Theory of Multimedia Learning' (Mayer, 2001) stories presented with additional visual and aural information that matches the story text may facilitate learning by providing nonverbal information about it, in addition to the language. Multimedia learning is based on Paivio's Dual Coding Theory (1986). Paivio (1986) found that it is easier to memorize words when they are matched with a nonverbal representation. The multimedia features in the present experiment were designed to support Dual Coding as they provide animations, music and sound effects simultaneously and corresponding to verbal narration.

In a review, Bus, Takacs and Kegel (2015) found positive effects for animated books

with background music and sounds when compared to static books on language development and story recall. This finding was confirmed in a meta-analysis (Takacs, Swart & Bus, 2015). In the same vein, we expected that music and sound effects might highlight and concretize emotions and thus facilitate emotional word learning from animated storybooks. For example, in the story "Little Kangaroo", Mother Kangaroo is too tired to carry her baby all day long and when she stops to sit down the background music stops, and a sound effect is added to show that Mother Kangaroo is exhausted parallel to the narration. We hypothesized that children would learn more words when listening to animated storybooks with background music as compared to animated storybooks without music. Additionally, the same was expected for stories presenting static illustrations instead of animation, i.e. music would enhance the learning of emotional words.

Methodology

Ninety-nine typically developing children (41 boys and 58 girls) aged 4 to 6 years (before starting formal schooling) from middle socio-economic status families in Bursa, Turkey, participated in the research. A between-subject design was applied in which children were matched based on gender (boy or girl) and age (4, 5 or 6 years old) before being randomly assigned to one of five conditions: a) static illustrations without background music or sound, b) static illustrations with background music and sound, c) animated illustrations without background music or sound, d) animated illustrations with background music and sound, and e) a control group in which children only participated in pre- and post-test sessions. About 20 children were assigned to each of the five conditions in which, apart from the control group, they encountered the two stories, twice, in the format corresponding to the condition. Only when parents had given informed written consent for their child's participation were they included in the present study. Children were taken from the classroom to a quiet place in the school for testing and the story sessions. First, children's general vocabulary and Theory of Mind skills were assessed in individual sessions. Following the pre-testing phase, readings were done in small groups of two or three children. The order in which the target books were presented was counterbalanced, meaning that half of the children started with the story "Bear is in Love with Butterfly", while the other half started with the story "Little Kangaroo". Thus, an order effect was avoided. After the intervention sessions, the children's story comprehension was assessed by asking them to retell the story in individual sessions. In further sessions, the children's word learning skills were assessed. The present study reports the results for word learning.

Materials

Storybooks: Two storybooks (Little Kangaroo and Bear is in Love with Butterfly) with a strong focus on emotions were

chosen as target books. The story of Little Kangaroo concerns a little kangaroo learning to be independent from her mother. The story of Bear is in Love with Butterfly focuses on their feelings of love for and loving each other, despite their differences and consequent huge misunderstandings.

Target vocabulary: Twelve less common words were chosen from each story. Six of them were emotional words and well illustrated in the background music (e.g. proud, in love, broken); the other six were neutral words that were not highlighted in the music (e.g. wide, bitter, firm).

Measurement instrument

Two vocabulary tests were developed by the researchers, to assess receptive and expressive knowledge of the 12 target words. The results regarding the receptive test are reported here. Children completed the receptive test in which they were shown four different pictures from the story and they were asked to select the one that corresponded to the target word that the experimenter spoke. Total scores were calculated for the six emotional and six neutral words for each child.

Results

Because two children were missing from the kindergarten, they could not complete the vocabulary tests, hence analyses were done on the data of 97 children. For all the variables, the distribution of the scores were normal (standardized skewness and kurtosis did not exceed +/- 3.29 in all cases). A one-way ANOVA was conducted on target vocabulary knowledge with condition as a between-subject factor. The effects of different features in the electronic books were examined by testing three a priori contrasts: (1) intervention conditions versus control, (2) conditions with music versus conditions with no music, and (3) conditions with static versus conditions with animated illustrations.

Animated storybooks with music and sounds were expected to facilitate children's word-learning more than the animated storybook condition without music or sound. In the same vein, the static condition with music and sounds was expected to outperform the static condition without music. In addition, it was expected that music and sound effects would play a specific role in illustrating emotions in stories, hence animated storybooks enriched with music and sound effects that emphasize emotions such as happiness, excitement and sadness would be particularly supportive of understanding emotional state words when compared to animated stories with no music or sound effects.

The experimental groups outperformed the control group on word learning ($F_{(1, 92)} = 7.41$ p < .001). This indicates that children learned new words due to the book readings. There were no significant differences between the animated and static versions of the electronic storybooks

(F (1, 92) = 0.00, p = .972), indicating that animations were not helpful than static illustrations in acquiring new word meanings. When books included music, children learned significantly fewer words as compared to conditions with no music (F (1, 92) = 11.78, p < .001, d = .80, 95% CI = .35 – 1.25).

There were no differences between emotional and neutral words or any interaction between word type and condition. Background music and sounds were expected to be helpful, especially for understanding and learning emotional words. The findings did not, however, corroborate this hypothesis. On the contrary, the results show that music and sounds interfered with learning new words. To explain this there are two possibilities within the theory of Multimedia Learning (Mayer, 2001) The first is that children physically might not be able to hear the narration because of the loud music. Due to background sounds and music, children may be unable to create a verbal representation of the text, and if such a representation is lacking it is not possible to connect a verbal representation to nonverbal information (images, music and sounds). It is also possible that it is difficult for children to interpret music and how it represents emotions, thus contributing to the nonverbal representation of events. As a result of that, children may not be able to figure out the meaning of unknown words in the text.

This is the first study, to our knowledge, to separate the effects of different multimedia elements, such as background music and sound effects, in electronic stories for typically developing children. The present study's results suggest that animation does not facilitate word learning. This finding is in contrast to previous results showing the benefits of such multimedia elements for children's story comprehension and word-learning (Bus et al., 2015; Takacs et al., 2015). Even more surprising, music had a negative effect on learning new vocabulary. This result is in line with the results of a

Figure 1. Children's word learning in conditions with music and sound effects and in conditions without music and sounds" Note: Maximum score is equaled 24
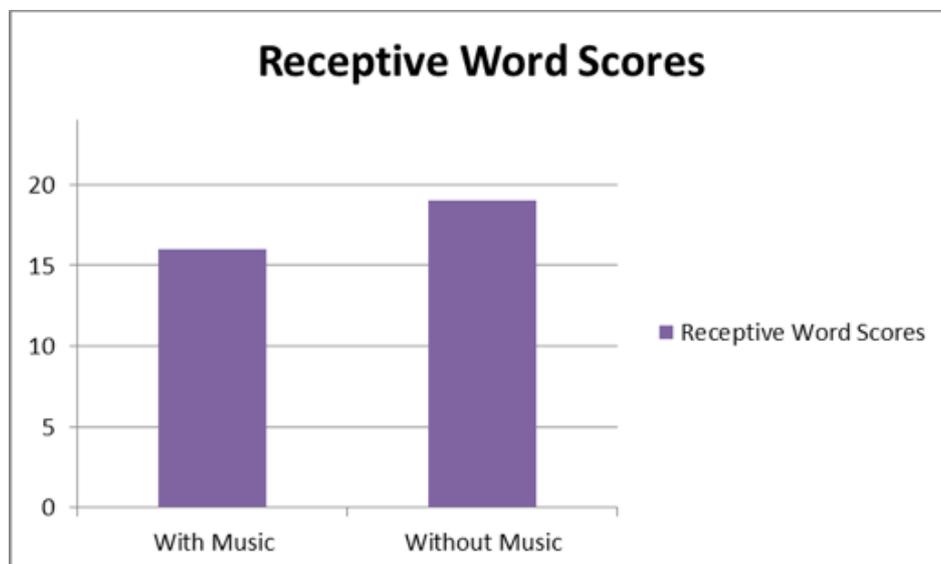
previous experiment with children with severe language Impairments (Smeets, Van Dijken & Bus, 2014). Children with language impairments have difficulties in understanding new vocabulary when there is music and sound effects and the presentation of music and sounds interferes with learning new vocabulary (Smeets et al, 2014). In the same vein, the present study demonstrates the negative effects of music on vocabulary gain, at least in this sample.

The aim of the current study was to differentiate between the effects of animated pictures on the one hand, and of background music and sound effects on the other. Storybooks with multimedia additions, such as animation, background music and sound effects, have positive effects on children's story comprehension and word learning (Bus et al., 2015; Takacs et al., 2015; Verllen, Bus & de Jong, 2006). The most surprising finding is that music was distracting and interfered with the comprehension of narration. Music might have interfered because the language was rather complicated for the participants in the current study who were not familiar with storybook reading (Park, 2008).

These findings provide evidence for cognitive overload from multimedia stories for a sample of Turkish children. Thus there is compelling evidence that, with the addition of music and sound effects, Turkish children find it difficult to learn new vocabulary from electronic book reading experiences. This illustrates that the internalization of apps, including electronic books, is not helpful for all children. It may be that in countries where reading performance is below average (OECD, 2012) parents are less aware of the benefits of sharing storybooks with children and might read to them less (Park, 2008). If that is true, Turkish children might be less familiar with the storybook reading paradigm and might find the situation of listening to multimedia storybooks confusing. According to this explanation, what works in countries with a rich literacy tradition does not necessarily work in countries where book reading is not an obvious element of early childhood education.

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Young children's digital literacy practices at home: social, physical and classed

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Abstract

This paper presents some initial findings from a mixed methods study looking at preschool children's home practices with television and related media in the United Kingdom. In contrast with many existing studies, the study suggests that preschool children in particular are likely to engage with television and related media at home in physical and social ways. Whilst every family is unique, the examples presented in this study suggest that digital practices are broadly different in households mapping onto different social classes.

Keywords: Television; home; social class; multimodality; child development

Introduction

It is often taken for granted that children's home practices with television and related media are both solitary and sedentary. Given the inattention paid to the social, it is perhaps unsurprising that existing studies examining very young children's relationships with television tend to be quantitative, light-touch and arguably rather reductive in relation to social class (with a focus on what and how much children watch). Social class is most often inserted as 'another variable' into existing debates about the negative aspects of television and related media.

This study investigates preschool children's home practices with television and related media by paying close attention to the totality of their physical, emotional and literate responses, as well as the social context of the family and wider community. It consciously engages with a socio-economically diverse range of participants. Drawing on a broad range of social and physical practices around television and related media in a diverse range of UK homes, it asks the question: 'How is social class implicated in these practices?'

Theoretical framework

In this study, the topic of preschool children's engagement with television and

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related media in the home is explored in relation to three interrelated theoretical resources:

(1) Critical developmental psychology: This study adopts a critical developmental lens that both incorporates and moves beyond the biological. It draws on Vygotskian (1978) notions of scaffolding, imagination and mediation as central to understanding young children's early explorative learning, whilst arguing that new materialism (Miller, 1987; Miller, 2008; Miller, 2009) and Deleuze & Guattari's notion of assemblages (1988) can help us to understand the child in relation to the broader material and social, bringing together entities that are organic and non-organic, material and abstract, technological and 'natural'.

(2) Multimodal meaning-making: The study is situated within an understanding that communication is multimodal. It draws its definition of 'multimodal' from related but distinct approaches, including the multimodal aspects of human communication (e.g. Kress, 2009) and its usage by cultural and media scholars (e.g. Hodge & Tripp, 1986; Messenger-Davies, 2013) who point to children's abilities to interpret the formal features and codes of specifically on-screen communication and make 'modal judgements' based on something more than language. The relevance and application of multimodality is complicated within this study, as very young children switch almost interchangeably between on-screen and

human cues to make judgements about meaning in everyday life.

(3) Social class: Finally, and perhaps most importantly of all, the study foregrounds social class, drawing on Bourdieu's notions of habitus (1990) and social capital (1992) and Gonzalez, Moll & Amanti's Funds of Knowledge approach (2006). The Bourdieusian notion of 'habitus' sees power as culturally and symbolically created and constantly re-legitimised through the interplay of both practice and structure. This notion is useful in understanding how family and community norms around television and related media might work – both in terms of channel and programme choices and the nature of the activities that take place around them. The Funds of Knowledge approach, meanwhile, helps with understanding the possible gulf between routine practices at home and school. Though Gonzalez, Moll & Amanti's original work focused on non-digital Funds of Knowledge, the approach creates a space to value a wide range of home practices (including the digital) and defend the need for these practices to be recognised as potentially valuable.

Methodology

The research adopted a mixed-methods approach informed by a multi-paradigmatic epistemological stance. In the first phase, a large-scale quantitative survey consulted

1,200 UK parents of children aged 0–6 years. The survey was targeted at schools across a range of communities in Sheffield (UK). Additionally, the survey was opened up to national completion via the CBeebies website, meaning that families from both ends of the socioeconomic spectrum were included in the sample. The survey provided an opportunity to identify up-to-date viewing patterns of 3–6-year-olds. Unlike some existing large-scale studies that do include 3- and 4-year-olds (e.g. Ofcom, 2015), this quantitative questionnaire was also designed to account for the social contexts of engagement and active responses to television and other media (whom does the child watch with, what else are they doing?)

The second phase of the project comprised more than 6–9 months of ethnographic fieldwork at home with eight UK families (including a focus child aged 3 or 4). The deliberately flexible methods included: semi-structured interviews with parents; ongoing participant observation; and visual methods including child-led tours of the home, videoing and parent smartphone photo diaries. Participants came from the Sheffield area and were recruited via the earlier questionnaire. Social class and socio-economic status are difficult and problematic to categorise. Families were, however, recruited on the basis of their responses to a modified Hope-Goldthorpe scale included in the original quantitative survey. Five families self-identified their work as 'manual' according to this scale (categories 5, 6 and 7), whilst three identified their work as 'professional' (categories 1 and 2).

Findings

The initial findings contest certain longstanding assumptions about preschool children's engagement with television and related media at home. Analysis of the quantitative and qualitative is currently ongoing, but headline findings from both data sets are reported. The data suggest that preschool children's practices with television and related media at home are: physical, social and classed. The three themes are interrelated. Two brief vignettes from the qualitative data are described below. These three themes are then explored in detail, below.

Vignette One: John, James and Fiona

John (4) and James (7) are brothers. I am visiting them for the fifth time and we have gone upstairs to the boys' shared bedroom. The boys have been telling me about their new favourite videogame, which is called Castle Crashers. Several physical artefacts around the room attest to this new interest. The boys have a Castle Crashers poster on the wall and are showing me cardboard cut-out figures of characters and cardboard masks they have made:

> James: *This one here, is supposed to be orange, but it's pink.*

> Fiona: *How did you know that?*

John: *There are little pieces on the piece of paper, and you had to cut them out and make that.*

Fiona: *Where did you find it?*

John: *The computer. We printed it out.*

Fiona: *Did you guys find it, or did mum and dad?*

John: *I found it with my granddad.*

James: *I wasn't there. I was at school.*

Fiona: *Was it when you were ill?*

John: *Yes. I didn't make it all. My granddad made most of it.*

Fiona: *It's cool.*

John: *You can cut it out and stick it.*

James: *Stick it.*

A member of John and James' family (in this case their granddad) has engaged with, and built on, their interest in playing with a digital game (Castle Crashers) and used it to engage them in other forms of both traditional and digital play. John and his granddad have gone onto the home computer together to find free Castle Crashers character templates, which they have printed out onto card, cut out and stuck together. Granddad has been able to assist in improving John's physical skills in making the characters as well as his ability to search for relevant content online. The boys are now, in their room, together, creating original play with the physical Castle Crashers characters. Both boys are also demonstrating knowledge about the characters in the original digital game, using the poster and cardboard figures to help them identify characters by their colours.

Vignette Two: Harry, Keaton, Johnny and Fiona

Harry (3) and Keaton (5) are brothers. I am visiting them for the fourth time. The boys have been watching television and we are playing in the living room with other members of the extended family, including Johnny (5). Other adults, including Johnny's mum, are in the kitchen. They have been telling me about a television show they like, The Powerpuff Girls. As they tell me about it, the conversation erupts into spontaneous and clearly previously rehearsed role play. The boys have also been playing with bats and balls.

Keaton: *Blue! Green!*

Fiona: *What, are those the different colours of The Powerpuff Girls?*

Johnny: *I'm pink.*

Keaton: *No, I am!*

Johnny: *No, I am!*

Johnny's mum: (shouts from the kitchen) *Stop it, you're showing off now.*

Johnny: *Harry's Bubbles, Keaton's leader…*

Keaton: *Yeahhhh! I get to be the leader! (jumps up onto a chair, dancing as he sings) I lead, you follow, a-ha-ha-ha!*

Johnny: *And I'm, I'm Buttercup.*

Fiona: *So, is this in Powerpuff Girls?*

Keaton: (jumps energetically onto the floor, from the chair)

Harry: (comes running in from the kitchen, role-playing flying as one of The Powerpuff Girls)

Keaton: *You need to follow me. You two need to follow me. I know, 'cos I've got two bats.* (suddenly holds up hands, as if to punch Johnny) *I'm a baddie, you crime!* (runs and jumps onto the sofa)

Harry: (runs and jumps onto the sofa, following Keaton) *I'm a baddie, you crime!*

Keaton: *We. Always. Win this.*

Fiona: *You always win?*

Led by Keaton (the oldest), the three boys are co-constructing a physical play scene based on mutual enjoyment of a television show, The Powerpuff Girls. Their shared knowledge of the characters' names and colours suggest they know the show well. Their discussions about the role each of them will play suggest prior instances of this play being created as a group. The boys' knowledge of the show is demonstrated in a physical, bodily recreation of the characters' movements (running, flying, jumping, fighting).

Preschool children's engagements with television are social

In recent years, researchers have become increasingly interested in the social contexts of preschool children's engagement with technology and digital media at home. Many studies have, however, been limited in the way the 'social' is conceptualized. Historically, many television studies drew on Piagetian (1962) models of social development (e.g. Singer & Singer, 1981, 1983). Such models will often fail to consider broader contextual social factors – the other roles parents may play or the place of peers, other family members and broader communities in situ. At the other end of the spectrum, developments in the study of the material (Miller, 1987; Miller, 2008; Miller, 2009) the post-structural (Deleuze & Guattari, 1988) and the post-human (Barad, 2003) offer new possibilities for conceptualizing physical objects and spaces as playing a social role in children's lives (e.g. Carrington & Dowdall, 2013, Chimirri, 2014).

Figure 1 shows parents' responses to the question: "For how much time per day do you (or another parent or carer) watch children's TV with your child?" The quantitative data in the present study show that parents spend a significant amount of time watching children's television with their children, thus confirming the importance of parents (and carers) in understanding children's relationships with television. Figure 2 shows parents' responses to the question: "Whom does your child normally watch live TV with?"

These data illustrate the complexity of preschool children's social worlds in relation to engagement with television. Half or more of the youngest preschoolers normally watch with an adult (e.g. 2½–3 years = 52%; 3–3½ years = 50%). For older preschoolers, other children start to have more of an influence (e.g. 40% of 4½–5 year olds watch with another child).

The qualitative data offer many examples of this complicated social engagement with television and related media, highlighting the importance of framing this social engagement in the context of the whole family and community. In vignette one, a grandparent is encouraging the brothers' interest in a digital videogame. His role is not confined to straightforward interventionist or mediator – he is using their interest to construct opportunities for other traditional forms of learning. In vignette two, the boys in one family demonstrate complex inter-individual knowledge of, and engagement with, the narrative content of The Powerpuff Girls.

Preschool children's engagements with television are physical

Many existing studies still take it for granted that all children's engagements with television and related media are 'passive' and 'sedentary' activities, both cognitively and physically. The cognitively passive conceptualization of television viewing has its origins in early models of social learning (see Bandura et al., 1961; Bandura et al., 1963). Taking their cues from this imitative model, early studies characterized children's TV viewing as a 'passive' activity (Riley & Ruttiger, 1949), in contrast to the 'active' participation children have in play and its 'consequent development of motor and social skills' (p. 231). Meanwhile, conceptualizations of children's engagement with television as physically inactive have been unquestioningly adopted by many studies up to the present day (Rey-Lopez et al., 2008; Robinson, 2001).

The quantitative data in the present study contest several persistent myths about preschool children's engagement with television, showing that watching television is neither passive nor sedentary. Figure 3 shows parents' responses to the question: "What else does your child do when they watch live television?" Though children aged 0–6 do sit and watch quietly, concentrating on the television sometimes (72%), they also talk to others about what they are watching (82%), dance (76%) and sing (75%). Figure 4 shows parents' responses to the question: "Which of the following does your child do after watching live television?" Activities relating to television extend far beyond viewing times – parents reported that 82 per cent of 0–6-year-olds sing songs from a show after watching, 72 per cent talk about the programme and 68 per cent use dialogue from the programme.

Vignette one complicates what is meant by physical and social play, as inter-generational members of a family team up to build together – physical objects, inspired by a digital game, designed by

someone else and uploaded to the Internet, to be downloaded, printed, cut out and reassembled into physical representations of characters in the game. Vignette two offers an example of members of one family acting out embodied knowledge of television characters in their co-constructed play.

Preschool children's engagements with television are classed

Existing studies examining very young children's relationships with television tend to be quantitative, light-touch and arguably rather reductive in relation to social class. Social class is most often inserted as a variable into existing debates about the negative aspects of television and related media (Dominick & Greenberg, 1970; Lindquist et al., 1999, Tangney & Feshbach, 1988). In other cases, writing about young children, television and social class tends to become reflective, arguably imposing a theoretical framework onto families' lives rather than trying to understand them (e.g. Walkerdine, 1986).

Although each family is unique, the examples presented in this study suggest that digital practices are broadly different in households mapping onto different social classes. These differences relate to: differences in the programmes and other source texts the children are drawing on; their playful and literate responses; and the social contexts in which they take place. In particular, parents (and other family members) interact with and 'frame'

children's home practices with television and related media very differently.

Many of the ingredients of vignettes one and two are similar. In both cases, young boys are drawing on an interest in a popular media text to inform play. In both cases, the youngest boy (aged 3 or 4) is interacting socially with another family member or members to construct this play. In both cases, the children engage in imaginative, literate and useful practices with television and related media at home.

In vignette one, boys from a family who self-identified their class as 'professional' are being encouraged by their grandfather to engage in traditional play, based on their pre-existing interest in a digital game. The grandfather's intervention has enabled the boys to extend their media literacy and physical skills. The younger boy has searched online for an activity based on his interests. He has also physically crafted cardboard figures from templates with his grandfather. In vignette two, boys from a family who self-identified their class as 'manual' are exhibiting their knowledge about the characters in The Powerpuff Girls using their bodies. Their play is very physical and, at times, comes across as loud and argumentative. Both instances of play can be understood as valuable in relation to existing play typologies (e.g. Hughes, 2002). It is, however, important to consider which of these forms of play might be applauded and built upon in a classroom, and which might be considered 'inappropriate'.

Figure 1: Time spent by parents and carers watching children's TV with their child per day
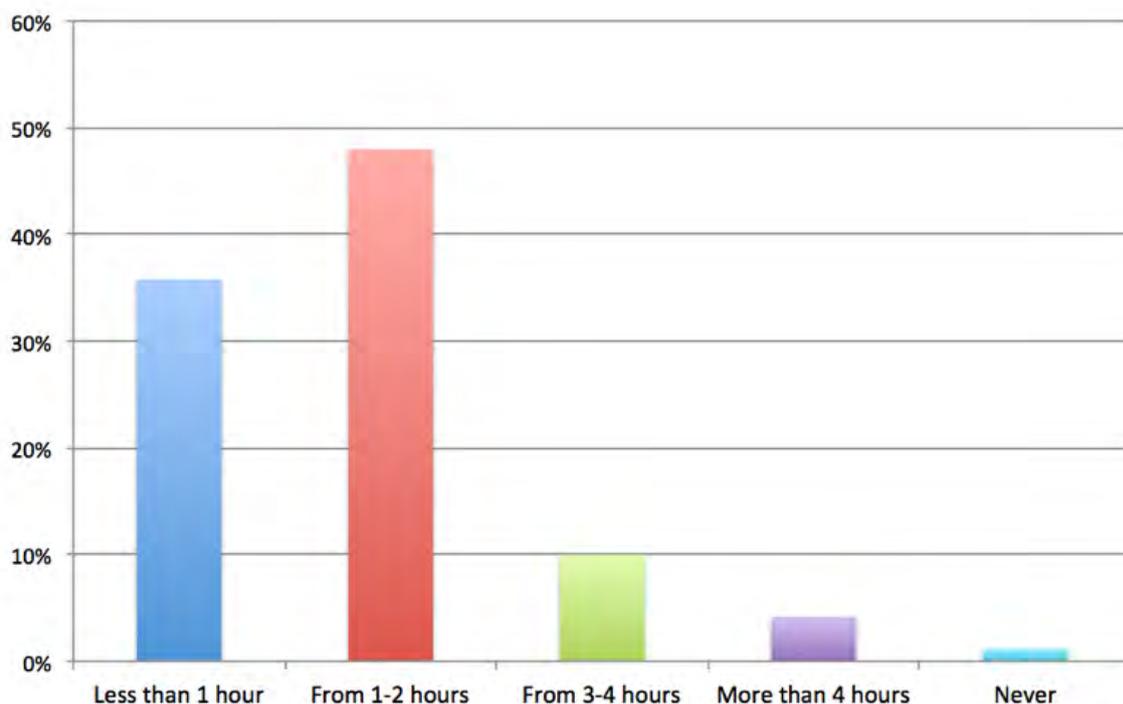
N = 1198

Question: For how much time per day do you (or another parent or carer) watch children's TV with your child? Put a tick in ONE box: Less than 1 hour; 1–2 hours; 3–4 hours: 4+ hours: Never.

Figure 2: Whom are preschool children watching television with?

	On their own	On their own with occasional help	With another child e.g. sibling or friend	With an adult	Rarely or never does this
2½ – 3 years	7%	7%	23%	54%	9%
3 – 3½ years	7%	9%	25%	50%	10%
3½ - 4 years	9%	8%	31%	42%	10%
4 – 4½ years	10%	11%	33%	40%	6%
4½ - 5 years	7%	9%	40%	36%	9%
5 – 5½ years	7%	9%	42%	36%	7%
5½ - 6 years	11%	5%	34%	35%	15%
6 – 6½ years	9%	11%	40%	26%	14%

N = 1115

Question: Whom does your child do the following WITH, most of the time? Put a tick in ONE box. Watching live TV: Usually on own; Usually on own, but has help occasionally; Usually with another child, e.g. sibling or friend; Usually with an adult; Rarely or never does this.

Figure 3: Activities of 0–6-year-olds while watching television
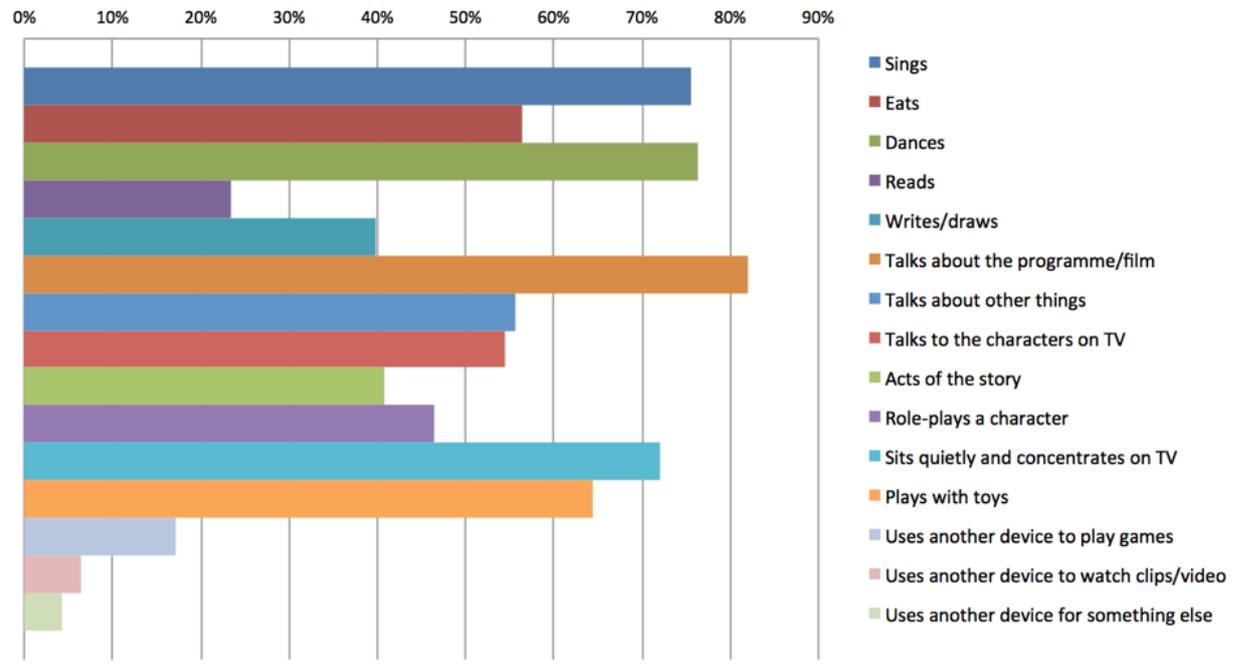
N = 1190

Question: Which of the following does your child do AFTER they watch TV? Tick ALL that apply: Talks about the programme/ film; Uses catchphrase or dialogue; Role-plays a character; Dresses up as a character; Acts out the story; Sings songs from it; Plays with related toys; Searches for related videos; Searches for related games.character; Sits quietly and concentrates on TV; Plays with toys; Uses another device to play games;

Figure 4: Activities of 0–6-year-olds after watching television
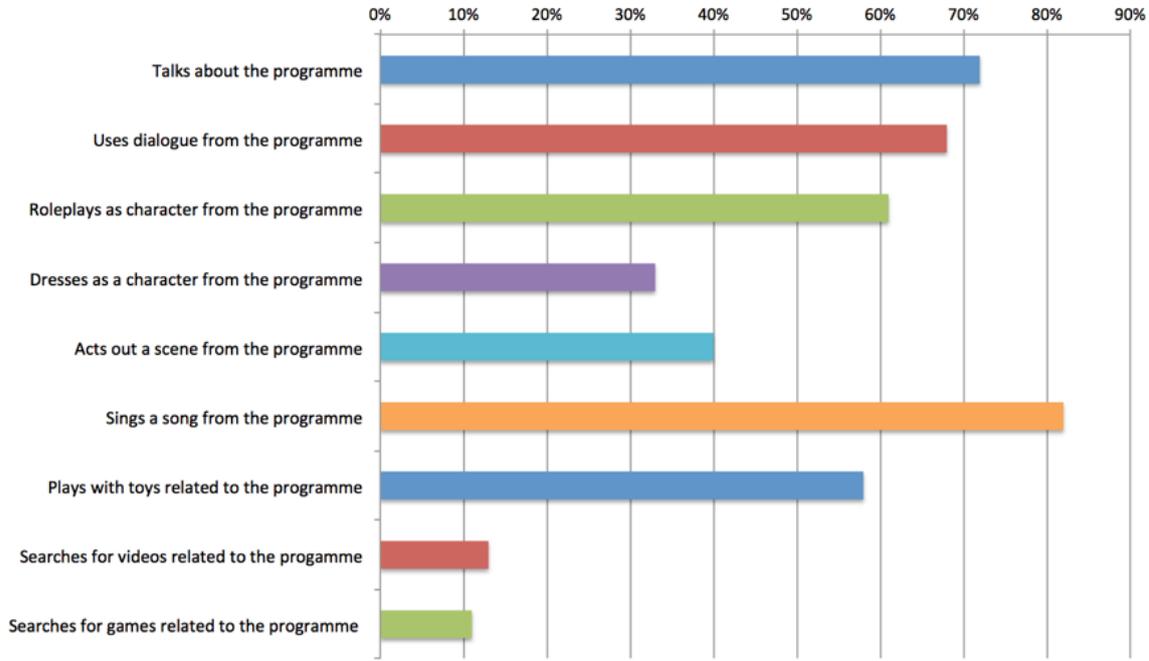
N = 1190

Question: Which of the following does your child do when they watch TV? Tick ALL that apply: Sings; Eats; Dances; Reads; Writes/ draws; Talks about programme/ film; Talks about other things; Talks to the characters on TV; Acts out the story; Role-plays a character; Sits quietly and concentrates on TV; Plays with toys; Uses another device to play games; Uses another device to watch clips/ video; Uses another device for something else.

Summary

The qualitative data suggest that children's home practices with television and related media are both physically embodied and enmeshed within a complex web of co-constructed meaning-making at home. Preschoolers' practices with television and new media take place as part of a complex web of objects, spaces, familial interactions and affect, as well as new and inter-media texts accessed across a growing range of devices. As such, the boundaries between body, media, technology and affectivity are becoming increasingly blurred. However, one of the implications of this study is that the gap between home and school literacies with regard to children's play around television and related media may be more pronounced and significant in the case of children from lower socio-economic status communities, should teachers fail to recognise their everyday practices as potentially valuable (Gonzalez et al., 2006).

Acknowledgements

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Design and evaluation of digital manipulatives for literacy learning in early education

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Abstract

This work investigates how Digital Manipulatives can be introduced and used in pre- and primary school to promote the development of children´s oral language skills and literacy. Oral language plays a major role in the learning of reading and writing in the elementary grades, being crucial for the development of children's personal, social and academic skills. Digital manipulatives employ physical artefacts to manipulate digital content, thus encouraging experimental, participatory and active involvement, and being especially appealing to young users. Moreover, they strongly stimulate collaboration and communication, greatly promoting the development of children's oral language skills. The investigation presented here reports previous work regarding the development and evaluation of a digital manipulative that was used in a preschool for an extended period of time, as well as ongoing and future work, which involves various pre- and primary schools. In addition, we report the creation of a Computer Clubhouse where children can explore this technology on their own.

Keywords: Language development, literacy, storytelling, digital manipulatives, playful learning.

Introduction

Technology that fosters open-ended and active exploration, while offering opportunities for peer collaboration and social interaction, may play an important role in children's learning (Bickhard, 1992; Eagle, 2012). Collaborative rich digital environments have the potential to create meaningful learning contexts that motivate young users, favouring knowledge construction while providing new experiences and interactions (Van Scoter et al., 2001:8; Shamir, 2009). Despite considerable advances, however, technology often fails to 'exploit the affordances of the medium' (Plowman et

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al., 2012: 5), merely transposing traditional content into a digital format.

Given this, and in order to create educationally relevant products that meet children's and teacher's needs, it is important to involve them in the design, development and evaluation of new technology. This is particularly important in pre- and primary school education, as stimulating rich environments plays a central role in the acquisition of early literacy skills (Whitehurst & Lonigan, 1998), while poor opportunities may have a negative impact on children's subsequent learning (MacGregor, 2004). According to Fletcher and Lyon, 'Success in literacy learning during the primary grades is even more indicative of later literacy achievement' (1998: xiv).

Digital manipulatives (Resnick et al., 1998; also called Tangible Interfaces –TUIs (Ishii & Ullmer, 1997)), are particularly interesting interfaces for young users, as they use objects and surfaces to manipulate digital content, thus supporting exploratory and expressive activities (Marshall, 2007). Due to its multiple access points, users can manipulate digital content simultaneously, which in turn promotes communication and negotiation (Hornecker, 2005).

This paper reports on the design and evaluation of two digital manipulatives, TOK (Sylla, 2014; Sylla et al., 2015a) and t-words (Sylla et al., 2012), and presents ongoing and future work.

Literature review

New technological developments in the field of interactive technology and tangible interfaces have resulted in the creation of various systems that address the development of oral language skills and early literacy through storytelling. Some relevant examples include StoryMat (Cassell & Ryokai, 2001), a soft play mat with sewn objects where children can play using stuffed toys. Gestures and the story told by a child on the mat are recorded and then compared with stories from children who have previously played on the mat. A story with a similar pattern is than recalled and played, acting as inspiration for the creation of new stories.

TellTale (Ananny, 2001) is a caterpillar with a body in five pieces and a head, which gives children control over the structure and content of their verbalizations. Children can record audio into each part of the body, and hear it by pressing a button. The pieces are independent of each other, can be randomly sorted and rearranged, and a new story can be created at any time.

Jabberstamp (Raffle et al., 2007) allows children to add sounds and voices to their drawings. Drawings, collages or paintings are created on a layer of paper placed on a Wacom tablet; by pressing a special rubber stamp on the paper, children can record sounds into their drawings. The system promotes the exploration of different discourses, allowing integrating direct speech (the speech of characters), with the presentation of characters and contextual information, done by the narrator.

Make a Riddle and TeleStory (Hunter et al., 2010) are educational language-learning applications developed for the Siftables platform. Make a Riddle teaches children spatial concepts and basic sentence-construction skills; TeleStory teaches vocabulary and reading, through the manipulation and combination of story elements.

Previous work

Within the scope of previous work, we have designed and developed two digital manipulatives – TOK and t-words – that target the development of children's early literacy. t-words (Fig. 1, right) consists of a set of rectangular blocks in which users can record and play audio. The blocks can then be snapped together, to play recorded audio in a sequence; by reordering the blocks in different ways, the audio sequence changes according to the order of the blocks. As the interface does not need a computer, it is flexible for use in various contexts. t-words was introduced in two workshops that took place in Kathmandu, involving children from two schools (Chisik et al., 2014). During the workshops children used the interface playfully, exploring sounds, words and sentences while engaging in collaborative work.

TOK (Touch, Organize, Create) employs physical blocks to manipulate digital content, comprising an electronic platform that connects to a computer or tablet and a set of physical blocks (Fig. 1, left). The blocks were inspired by classical narratives for children and represent characters – heroes and opponents (Propp, 1928/1968) – objects and nature elements. Placing a block on the platform displays corresponding digital content on the screen. The sequence of blocks placed on the TOK platform creates a visual narrative, which unfolds according to the sequence of blocks placed on the platform; as such, there are no predefined stories, leaving space for children's own creativity. When a block is removed from the platform it also disappears from the screen.

Figure 1. TOK platform (left), t-words interface (right)
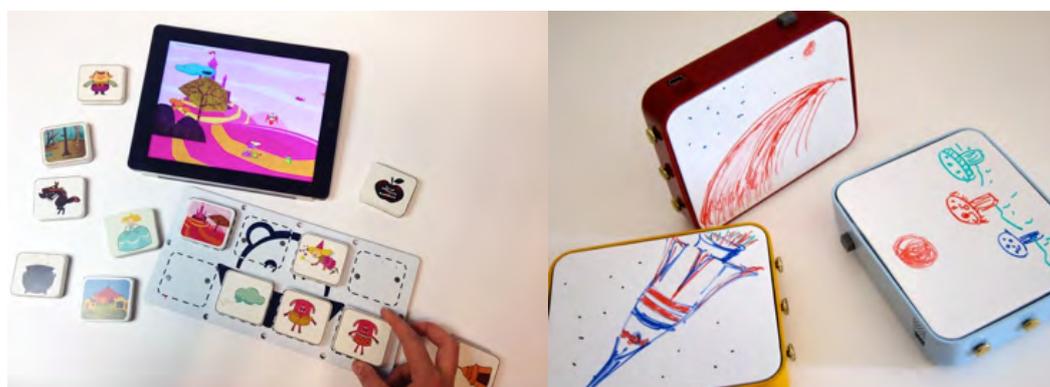
Methodology

The work followed a Design Based Research methodology (Anderson & Shattuck, 2012), a methodology that is practice-driven, pragmatic, flexible and iterative, involving an engineering component.

Context of the research

TOK was developed in collaboration with a Portuguese preschool involving six classes of preschoolers, five years of age, and six preschool teachers, spanning a period of around three years. Following TOK's implementation, three interventions were carried out in preschool for a period of around one year, involving two preschool classes and two teachers. Although the teachers remained the same, each year the researcher worked with two new groups of children, specifically two classes completing their last preschool year, just before entering primary school.

Methods for data collection

During the design and development stages of the digital manipulative, various methods for data collection were used, such as participants' direct and indirect observation, field notes, video recordings, transcription and analyses, semi-structured interviews, Wizard of Oz techniques and low-tech prototyping. The emphasis was on an iterative cyclical process of designing, testing and redesigning, always incorporating the feedback provided by users in new iterations.

Evaluation of the digital manipulative mostly followed a quasi-experimental approach in which various methods for data collection were used, such as participants' direct and indirect observation, field notes and semi-structured interviews, as well as video recordings, transcription and analyses.

Interventions carried out at preschool

Following the development of TOK, three interventions were carried out at preschool. The first involved 24 pairs of children who interacted with TOK during free play over a period of four months (Sylla et al., 2015b). This intervention investigated how children used the system and the activities in which they were involved. The results show that the children mostly engaged in literacy related activities, creating stories and playing language games. Also, TOK encouraged peer collaboration, motivating children to get involved in collaborative language-related activities. The second intervention was carried out in collaboration with the preschool teacher and her class of 20 preschoolers for a period of three months. This intervention investigated whether the use of TOK promoted the development of language abilities that are relevant for formal literacy learning, specifically lexical knowledge and phonological awareness. The third intervention studied the narratives created with the digital manipulative during free play, spanning a period of six months and

involving 27 pairs of children (Sylla et al., 2014). This study focused on children's embodiment of narratives, and how embodiment shaped the creation of their stories.

Results

The results from the first investigation show that while using TOK, children were mostly involved in literacy-related activities, creating stories and playing language games. The digital manipulative promoted a high degree of engagement, encouraging peer collaboration, and motivating children to participate in a creative process of planning, reflecting and expressing their ideas. During the second intervention, the construction of multiple fictional worlds motivated children's continuous verbal interactions with the learning tool, contextualizing the learning of an extensive collection of vocabulary and the playing of language games (Sylla et al., 2016). Throughout the third intervention, we observed that by using the digital manipulative, children's narrative construction occurred on three levels as they became directors, actors and spectators of their narratives. Namely, by choosing the characters, location, props and nature elements, children acted as 'directors' of their stories, simultaneously performing as 'actors' by embodying different story characters, and finally by observing the stories they were creating the children became spectators of their own narratives. The sharing of input devices (blocks) gave children equal control of the performance and orchestration of the story, while promoting and supporting peer collaboration. We called children's creations 'embodied stage narratives'.

Ongoing and future work

Following the development and evaluation of TOK, ongoing and future work does and will involve several pre- and primary schools. As previously, the research team involves children, teachers and investigators from education and engineering. Following the establishment of a collaboration protocol with the schools, the researchers and teachers will discuss strategies and plan the integration of digital manipulatives in class. Specifically, the groups will discuss and define which areas they want to target, outline the competencies they wish to stimulate, and accordingly draw up a set of activities to carry out in the classroom. Further, the groups will discuss and develop evaluation metrics in order to assess children's progression.

Along with interventions at school, the team will create a Computer Clubhouse, which will provide an informal setting where children can explore the technology on their own. This, in turn, will allow the researchers to gather information on how children use the technology in a natural way, and the kind of activities they engage in. Additionally, the Clubhouse will be a space where researchers and children can explore, design and test new educational materials.

Expected results

Through this study we expect to collect information about the use of digital manipulatives in pre- and primary school and their effect on children's literacy acquisition, as well as to create new learning materials that promote literacy. Further, we expect to involve the community in this project through the creation of a Computer Clubhouse.

Conclusion

In this paper we have reported previous work which was carried with a digital manipulative that involved various groups of preschoolers and their teachers. The results obtained show that digital manipulatives are powerful tools that motivate children to become involved in collaborative exploratory language activities, such as creating narratives or playing language games. Further, we have described ongoing and future work which aims to extend the use of digital manipulatives to primary school in order to investigate their educational value.

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From Digital Literacy to Capability: Developing Digital Literacies Through Family Engagement

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Abstract

This article discusses the findings of a research project evaluating the intervention of a multinational technology provider (Samsung) in a school ('The Academy') in a socio-economically deprived community. This intervention centred on the development of digital literacy skills through family learning and the co-production of digital media. As this research involved working with vulnerable participants – targeting Academy learners with special educational needs and their socially isolated, disadvantaged families – Amartya Sen's capability approach was adopted (Sen, 2005) to both situate the research and meaningfully capture the voices of participants. This research identifies a shifting relationship with digital literacy skills for certain vulnerable groups, and the complexity of developing these digital literacies in a family-learning context. For socially disadvantaged individuals and learners with additional learning needs, digital literacy skills have become a necessity for meaningful participation in society and their education. Moreover, this research presents the capability approach as a socially situated, holistic and humanistic framework for understanding digital literacy and digital interventions.

Keywords: Digital literacy, capability, engagement, family-learning

Introduction and background

Currently, there is a societal movement towards developing digital literacies in educational and community settings. This was manifested in the creation of what was a then 'new' computing national curriculum and multiple, often commercially-backed, initiatives focusing on developing digital skills. The justifications behind this push towards digital upskilling are twofold. First, when discussing the general population of Western societies, digital literacy is seen as serving an integral part in other complementary literacies (UNESCO, 2011).

Secondly, digital literacy is frequently elevated in relation to the schooling of children.

Digital literacy as a socio-civic necessity

According to a policy brief published by the United Nations Educational Sciences and Cultural Organisations, 'Digital literacy is a life skill because it targets all areas of contemporary existence' (UNESCO, 2011). Indeed, this same policy brief argues that digital literacy is key in the development of aspects of other literacies – which stands to reason, given the pre-eminence of digital representations of information and knowledge. Additionally, as we are witnessing the computerization of society (Kling, 1991), the 'softwarization' of working practices (Manovich, 2013) and the digitization of governmental services (Kazuya, 2014), digital literacy can be viewed as a necessity for economic and socio-civic engagement.

In the UK, with the rise of the information society, and the movement towards a knowledge-based economy, digital literacy has been increasingly seen as an economic necessity in three ways. First, the technical ability to create, curate and manage underlying information processing systems has created a demand for technical specialists. Secondly, the softwarization of working practices (Manovich, 2013) – and the processes by which people enter employment – results in a greater requirement for digital skills across the general workforce (ECORYS, 2016). Finally, the integration of digital literacies with learning and training and the requirements of a knowledge-based economy including constant retraining of the workforce to meet the skills needs of future jobs are in themselves increasingly digital (Rantalla & Suoranta, 2011).

Fitting with the capability approach that will be discussed in more detail later, here we can move beyond looking through an economic lens and see a similar necessity for digital-literacy skills. In the UK, there is a movement towards the digitization of public services, which is predominantly justified as a cost-saving measure, wrapped in future-orientated rhetoric (Office, 2014). Additionally, this movement towards digitizing public services is part of a broader European eGovernment strategy that is currently scoped until 2020 (European Commission, 2010). For the individual citizen, then, there is therefore a need for digital literacies in order to access public services including, in the UK, applying for social housing, job-seeking and accessing state-supported income.

Moving away from both the economic and socio-civic necessities of digital literacy, we can also see a sociocultural significance. With notions of participatory culture that elevate people's capacity to participate in culture using digital media (Jenkins, Ito & Boyd, 2015; Jenkins, Purushotma, Weigel & Clinton, 2008) comes an extension of existing culture into online spaces, as society and culture are increasingly mediated through digital technologies

(Livingstone, 2009). Therefore, digital literacy becomes a requirement for participating in this digitally embedded, highly mediated culture. Moreover, through the lens of New Literacy Studies, we can see digital literacy as a situated practice that is both reinforced by and necessary to engage with sociocultural contexts (Mills, 2010; Street, 2003).

Digital literacy to protect and empower children

Within this broader prioritisation of digital literacy, children have become a specific focus. Currently, in the UK, there is movement towards the development of digital skills – particularly computer programming – among children. Discussions of the importance of digital literacy for children reflect of course the broader reasons outlined above. Children's digital literacies are frequently described in relation to learning and development in other subjects (Buckingham, 2011; Livingstone, 2014; UNESCO, 2011), the importance of digital skills when preparing them for entering the workforce (ECORYS, 2016) and their ability to engage with a participatory culture (Jenkins et al., 2015).

When discussing children's digital literacy, however, the somewhat functionalist position evident above is overshadowed by protectionist and empowerment perspectives (Buckingham, 2007; Hobbs, 1998, 2011; Mendoza, 2013). These perspectives are difficult to decouple and do indeed share common themes of technological determinism, essentialism (Buckingham, 2008) and, of course, a call for prioritising the development of digital literacy. However, they differ in the specific motivations underlying this perceived importance.

From a protectionist perspective, it is now seen as a societal necessity to educate children in the dangers of the Internet, and how they can critically engage with the digital media they consume (Livingstone, Buckingham & Davies, 2009; 'Safer Internet Day', 2016; Selwyn, 2009). Here, the notion of the digital native becomes problematic as it conflates children's familiarity with digital technology and the ability to critically, and safely, engage with it (Livingstone et al., 2009; Selwyn, 2009). From an empowerment perspective, however, this notion of the digital native provides a foundation for intrinsic digital literacy that can be built upon to form a generational vanguard of civically engaged digital makers and prosumers (Buckingham, 2010; Jenkins et al., 2008; Tapscott, 2009).

This increasing societal importance – justified through functionalist, protectionist and empowerment perspectives – given to digital literacy is manifested through the creation of a national computing curriculum (DfE, 2013) and the plethora of commercial and charitable initiatives that are emerging (Barclays, 2015; Lynch, 2016). These digital literacy learning opportunities, that operate outside of the classroom, invoke notions of third-space learning, i.e. learning that takes place 'across the home-school divide' (King, Kersh, Potter & Pitts, 2015).

This is significant as it is these third spaces, especially those that are community-driven, that provide a focal point for the development of digital literacies for both parents and their children. Indeed, it is in these spaces that both parents and children can engage through the identity of a learner.

Theoretical framework – family engagement and digital literacies

As identified, there is an overlapping discussion regarding the importance of digital literacy for both parents and children when observed through economic, socio-civic and cultural engagement, and learning lenses (ECORYS, 2016; European Commission, 2010; Jenkins et al., 2008; Rantalla & Suoranta, 2011). Given this overlap it is, therefore, worth considering the development of these digital literacies through family learning, due to their importance for parents and children. This framing of digital literacy through a family learning lens invites additional justifications that elevate its importance.

For instance, the increasing role of digital technology in education (Livingstone, 2014; Selwyn, 2016) and lifelong learning (Rantalla & Suoranta, 2011) creates individual significance for children and parents. However, the use of technology in education specifically puts an onus on parents to become digitally literate, such that they can engage with their children's learning at school (Becta, 2008; Hollingworth, Mansaray, Allen & Rose,

2011). Additionally, given the importance of digital literacy for children, from protection, functionalist and empowerment perspectives there is an obligation on parents to be able to curate safe digital practices and promote learning about, and through, technology (Livingstone, Haddon, Görzig & Ólafsson, 2011; Sefton-green, Nixon & Erstad, 2009). This dynamic is, however, muddied by the notion of the digital native and the suggestion that children teach their parents how to use technology (Ofcom, 2011; Selwyn, 2009).

This research exists at the intersection between the need for parents to be digitally literate to support their children's learning and the necessity of digital literacy for parents and children's own socio-civic engagement and learning. Here we explore the development of digital literacies through these individual and family lenses and family co-production activities. In doing so, this research contributes to the broader discussion of digital literacy in relation to adults' and children's learning. Furthermore, it signposts the as yet unexplored area of family digital-literacy learning.

Research position

Amartya Sen's concept of capability was used to create the methodological and ethical foundations for this work. The work of Sen stands in contrast to the approaches and frameworks adopted by groups of people who, though well-meaning, prioritise traditional economic measures of wellbeing. Instead, the

capability approach frames well-being in terms of human agency. For Amartya Sen (2008), it is based on an individual's socioculturally situated capacity to engage with opportunities that are meaningful to themselves:

The capability approach to a person's advantage is concerned with evaluating it in terms of his or her actual ability to achieve various valuable functionings as a part of living … Some functionings are very elementary, such as being adequately nourished, being in good health, etc., and these may be strongly valued by all, for obvious reasons. Others may be more complex, but still widely valued, such as achieving self-respect or being socially integrated. Individuals may, however, differ a good deal from each other in the weights they attach to these different functioning's – valuable though they may all be – and the assessment of individual and social advantages must be alive to these variations. (Sen, 2008: 271–272)

The significance of this approach for this research is threefold. First, it avoids a prescriptive means of understanding the 'success' of any digital intervention – instead framing the effectiveness of the project in terms of parents' increased capacity for new 'functionings' that are meaningful to them. Second, it avoids purely economic measures of the importance of digital literacy, an approach that is apparent in the majority of policy discussions, therefore acknowledging the sociocultural situated ness, and potential impact, of digital literacy. Finally, it avoids technological determinism by acknowledging that access to a resource (in this case, digital technology) in itself is not enough to create meaningful functions.

Research setting

This research was undertaken at an all-through academy catering for 1,200 students, from nursery to sixth form. The Academy is split over four campuses in the Isle of Portland, each of which was, historically, a separate school. The island itself has a population of 12,000 and can be described as socio-economically disadvantaged – 15.4 per cent of children have a Child Protection Plan and the region scores among the lowest 20 per cent nationally on child wellbeing, education, health and disability indexes. Additionally, those who work do, in many cases, earn below the standard living wage (taken as below 60 per cent of national average yearly income) and are classified as 'working poor'. Moreover, a local housing association proved to be a key stakeholder in the project and the academy due to providing housing for over a third of the children attending the academy.

Through the capability framework and understanding of the island context, five key research questions emerged:

1. How do the school management, teachers, parents, community stakeholder groups and service users define capability?

2. In what ways can digital-learning technology develop capability with broader societal benefits outside of the school?

3. What are the required conditions for digital-learning technology to foster capability and lead to empowerment, engagement and inclusion in community contexts?

4. What is the current level of digital literacy within the Isle of Portland community, and how does this impact upon public use of community services?

5. Can the provision of digital-technology and digital-literacy training lead to greater educational engagement from learners and their parents/ caregivers?

Methodology

In order to understand the various stakeholders' – including families' – perceptions of 'capability', and what meaningful opportunities can be created through access to digital technology, pre-intervention stakeholder semi-structured interviews were undertaken. Following this, specific families were invited to participate in a digital families programme. Two forms of pre-intervention profiling were conducted. First, confidential data generated by the school provided profiles of families with a living-wage income, a student with disclosed SEN attending the school and meeting threshold criteria for 'disengagement'. The sample was generated from this group. Secondly, technology access and perception profiling was conducted through a survey administered by the school.

Invited families participated in pre- and post-programme semi-structured interviews, as 'respondents are encouraged to set the agenda, though the presence of the interviewer and other forms of control exerted by them means that the respondent never has full control of the setting' (Scott and Usher, 1999: 109). The workshops themselves focused on digital media co-production activities. These workshops were designed and facilitated by the researcher-in-residence who made observations and kept a reflective journal throughout.

Findings

As this research set out to address a complex mixture of individual digital literacy development needs, through the highly situated capabilities approach, the findings will first discussed first on their own terms, then in relation to the specific 'capabilities' of the family participants. Through the pre- and post-intervention semi-structured interviews and the researcher-in-residence's observations and reflections, six themes were identified. Each of these themes speaks to different expectations, parental perceptions, the learning environment itself and the role of digital technology

Desire to support children with special educational needs: The parents were very forthcoming about the specific additional learning needs of their children. Early in the project – and during discussions with some

special educational needs teachers – it was assumed that some parents might be unwilling to discuss these issues. Moreover, there was a tangible desire on the part of some parents to take part in the programme as it would demonstrate how technology is currently used in the classroom – especially in relation to children's special educational needs. For one child with behavioural difficulties the parents suggested that '[Using tablets] can calm him down, his concentration can be there.'

Simultaneous perception of the 'frivolity' and 'purposefulness' of technology: There is a perception of digital technology being both a hindrance to and a facilitator of learning. This of course speaks directly to the empowerment-protectionist dichotomy. Additionally, discussions regarding the role of technology in family life highlighted tensions surrounding how often it is used. This dichotomy then began to emerge as a paradox in how parents were reporting how they manage the use of technology, first suggesting that they allow their children to use digital devices freely, as they reported their children predominantly using educational apps, but then going on to discuss having to limit usage – in the morning and evening especially.

Reverence of the 'digital natives' and self-dismissal of the 'digital immigrants': Parents frequently discussed their children's use of technology in reverential tones – specifically referencing their speed at picking up new things. According to some parents though, this was slightly bemusing as their children would only have to watch them do something once to be able to do it themselves – which became an issue with regard to using passwords and child-locking tablets. Perhaps due to the nature of the interviews, when parents discussed their own digital literacy they would draw comparisons with their children and further elevate them, whilst dismissing their own in comparison. This perceived lack of digital literacy was, however, a key motivator for some parents to take part in the digital families project. Additionally, following the project, the capacity for children to share what they had learnt reinforced this digital native reverence:

> *"And Hugo's passed on what he learned. For example, his cousin's got a tablet and sometimes Hugo takes a tablet over there and shows him how to find certain things. He's actually taking his knowledge and given it to his cousin."* (Parent)

Additionally, some parents acknowledged their inability to teach children how to use technology, and the fact that they would in fact learn from them, though this was not presented as a clear-cut reversal of 'power':

> *"I have a tablet, but haven't got my head around it enough to use it with the children."* (Parent)

> *"…sometimes they teach me, it works both ways."* (Parent)

Technology as a facilitator of learning experiences: Parents frequently framed

technology as creating learning opportunities that are often independent:

> *"Both daughters are really good at maths now – as a parent you don't have to sit next to them to explain things – this year it's amazing [they use technology] to do maths and get awards. She loves it. Even when she reaches [her target] she keeps going."* (Parent)

This almost became the default measure by which children's interactions with technology became framed in relation to what they are learning. For instance, when discussing having school-connected technology at home, one parent suggested this meant "…*they've got no excuses, have they?*"

From the perspective of the research facilitating workshops, the co-production of digital media created a positive learning environment. Children's 'fearless' approach to engaging with technology when given a task, combined with parents more 'fearful' or muted approach, created a dynamic in which the children would, seemingly, play with software whilst their parents asked reflective, critical questions.

Engagement with learning through technology affordance and technology as an incentive: Throughout the entire project there were persistent references to notions of engagement in relation to technology. For some parents, technology was seen as an enabler for engaging with their children's learning or, at the least, their experiences at school:

> *"I see their blogs – some teachers are very good at uploading things. You can see what they did at school – they don't always tell you. All the teachers should do it – I really like it."* (Parent)

As for children's learning in itself, one parent described it as a "leveller" for students with special educational needs. Additionally, technology, or specifically novel 'fun' technologies, became an effective way of initial engagement with the school. According to community outreach workers, this same approach of using technology to engage, but not necessarily with the technology itself, was quite common.

Differing definitions of capability: There was a mismatch between families and stakeholders when discussing the desired outcomes of the project. Families primarily framed their desires in terms of confidence – or self-reliance – in using technology, and the capacity to understand and undertake positive pedagogic practices at home. The Academy and community stakeholders, however, framed capability gaps in terms of low aspiration, low employability and a lack of engagement with the school and community services.

Here it is probably worth explicitly revisiting the capabilities approach. As well as informing the philosophy of this research, the digital capabilities approach has been developed as a framework for projects. There are multiple emerging projects at local or national governmental level, in charity or tertiary sector organisations, and indeed in commercial entities. As demonstrated in this and similar research,

there is a trend towards a deficit model of parental engagement, especially in areas of socio-economic disadvantage (Barton, Drake, Perez, Louis & George, 2004). In addition to the specific findings relating to digital literacy development through family learning, this capabilities approach has significance for future digital-intervention projects.

From digital literacy to digital capability

Parent capabilities are subject to multiple impediments beyond simply digital access or digital literacy – including financial trust in institutions, time constraints and the internalisation of anxiety around screen time, and notions of the correct/ incorrect use of technology. The single biggest factor in levels of collaborative digital capability in family settings remains an economic one. As the recent 'Opportunities for All?' report indicates, whilst Internet connection is ever increasingly 'the leveller', low-income/ living-wage families are impeded by slower connections and reduced to using single mobile devices. Capability is undermined by the need to plan ahead to access fast Wi-Fi in a public space or hindered by interruptions to connections in the home.

In addition to making explicit the link between digital literacy and other impeding factors, this research has identified a complicated picture of digital capability for learning. Of course, the capability approach itself results in a highly situated and holistic understanding of the role of digital literacy in digital capability and learning.

Throughout the project, however, the majority of students, though rarely all, demonstrated a new 'capability' in relation to learning practices. For instance, the families' children demonstrated independent and peer-assisted learning in new digital contexts, and a capacity for transitioning between the two approaches when appropriate. Children also demonstrated an awareness of their own learning strategies through curating suitable applications for use in at-school learning. Moreover, the children, and parents, began to demonstrate a confidence in a 'flipped learning' family context and sharing a leadership role.

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Childhood, digital culture and parental mediation

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Abstract

The media habits of young children have changed over the years as new technology emerges and becomes ever more ingrained into the home and social contexts. As professionals who work with young children or/and with teachers of young children, it is imperative that we understand the realities of children's lives with new media. In this text our goal is to think the childhood in the new familiar contexts, where the digital media are an important role, and discuss some aspects related with the parental media guidance, or mediation, of young children. Parental mediation is seen as a key strategy in developing children's skills to use and interpret the media, foster positive outcomes **and** prevent negative effects of the media. We hope that this debate will contribute to a greater understanding of the parental roles today, namely in relation to supporting children's digital literacy.

Key words: Childhood; Digital media; Parental mediation.

The new childhood

It is now recognised that digital technologies are ingrained in our life and have changed our daily lives both in professional contexts, whether social or familial. Each time access to technologies is done early, starting right in the first years of life, causing numerous changes in the child's universe and their vision of the world. So, we want to contextualise the contemporary childhood and its relation to the digital culture.

As we all know, the media habits of young children have changed over the years as new technology emerges and becomes ever more ingrained into the home and social contexts.

In fact, new technology sometimes brings change that is so swift and sweeping, that the implications are hard to grasp. Such is certainly the case with the rapid expansion of digital media used by children and youth. These changes are reflected in the concept of childhood itself, as Edvaldo Couto suggests:

> Childhood as we know it, is changing due to numerous factors, as: the contact with

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several multicultural manifestations; the complexity of the transformations present in the daily life of cities, families and ways of interaction with mobile technologies; the hybridism between traditional and new ways of playing and having fun. The fascination with the electronic games, digital social networks, connectivity, etc. Such factor modify ways of life and mark changes in ways of understanding childhood and the place that children take in that scenery, in which the systems of meaning and cultural representation multiply. (E. Couto, 2013 p. 898)

We take the idea that there is a children's cyberculture in which kids participate actively, creating and redefining ways of playing carried by the digital technologies. Today, the social environment of children isn't only physical but also digital. As a socio-cultural subject, the child lives and promotes changes in their context of life in which the digital media increasingly mediate the social relationships. With effect, the digital media aren't just objects. They are connectivity, share, interaction, relationship with others and the world. They are also, new and important pedagogic contexts (Amante, 2011). Thus, children's cyberculture must be understood beyond the gadgets and their uses. It is, mainly, a vast set of behaviors and knowledge, of interactions and created contents, also by the children, with the digital technologies, as cultural tools of our times.

Children's new media habits

As professionals who work with young children or/and with teachers of young children, it is imperative that we understand the realities of children's lives with new media. This includes understanding the home contexts where children use the technology and how this use influences modern household arrangements, familiar dynamics and communication patterns.

Surely a better understanding of the new norms of behavior among younger children will help to prepare educators, parents, and policymakers to promote learning and a healthy development.

We reviewed some studies and reports— about young children and their ownership and use of media (Hasebrink; Livingstone; Haddon: & Ólafsson, 2009; Gutnick; Robb; Takeuchi & Kotler, 2010; Formby, 2014). The table 1 can give us an idea about the children's new media habits.

It should be noted, however, that not all children have access to newer digital technologies, nor do all children use media in the same ways once they do own them. Family income continues to be a barrier to some children owning technology (Gutnick, 2010).

Parental roles

Online risks and opportunities

When we think about the part that parents play towards the use of technologies, one of the imperative questions in most studies and reports is related to online safety issues, whether regarding content or contact and risky behaviors.

Certainly this preoccupations exist and they are legitimate, but also, in most cases, they go beyond the use of the media. Vulnerable

children online are, usually, vulnerable in their offline lives.

> A vigorous national dialogue is taking place over the right balance between media consumption, the potential negative impact that inappropriate digital content can have on vulnerable children, and the worry that children are increasingly leading physically inactive lives. These legitimate concerns must be juxtaposed with emerging evidence from the learning sciences and innovative practices showing how well-deployed digital media can promote new skills, raise achievement, and bring children together across time and space. (Gutnick et al. 2010, p.2)

Parental guidance, parental mediation

Especially in the last decade a series of studies undertaken by academic experts has documented the use of media by youth, with most of the studies focused on children aged 8 and up. However, relatively little research has been done on children during the preschool and middle-childhood periods. We can find several texts about parental guidance, but little empirical research on how and why parents mediate the digital media use. The influence of parents on children's media practices determines their media induced learning, play, and social development.

Some studies about the parental role on media use point to several types of guidance, largely described as 'parental mediation', defined as "*any strategy parents use to control, supervise or interpret media content for children*" (Warren , 2001, p.212).

According to the review of Nikken and Schols (2015), parents apply various routines in guiding children's media use. Studies have shown that these routines can be divided into distinct types of parental mediation (Marsh et al. 2005; Böcking and Böcking 2009; Nikken and Jansz 2006, 2013; Sonck et al. 2013; Valkenburg et al. 1999).

Types of guidance

(1) posing restrictions on time and content, usually referred to as restrictive mediation;

(2) discussing content and giving explanations or instructions to the child to enhance safety, raise critical awareness, or stimulate learning outcomes (active mediation);

(3) co-using the media intentionally together with the child, mostly for entertainment or educational purposes.

(4) supervision as a form of mediation, i.e., staying nearby to keep an eye on the child when it is using an electronic screen on its own,;

(5) monitor the child's online activities afterwards, e.g., checking the browser history or logs from social media applications;

(6) use technical restrictions, such as 'parental controls' provided by media devices to regulate or block inappropriate content.

Parents seem to prefer the first five social strategies as compared to the use of these

technical applications (Livingstone and Helsper 2008).

Variables of Parents' media guidance

Parents vary widely in their mediation practices. But, what determines this variability in guidance of the children's media use?

Some studies have demonstrated that this variability is related to demographic variables, such as the parents' age, gender, and education or income level; other factors as parents' own media use and skills, and family context variables, such as family size, marital status, and the number of media screens at home, are also associated with the variability of mediation practices (Böcking and Böcking, 2009).

The education of children within the family is further divided according to gender stereotypes. Craig (2006) states that mothers exert more often mediation on children's media use practices. Also the research shows that the families of high socio-economic levels and higher education level, invest in the purchase of electronic devices from the perspective of children's development. They reveal guidance of activities with media more easily than the families less educated and with a lower income (Ito et al. 2010). At the same time the level of parents' technological literacy also influences the ease of guiding children in the use of media (De Haan, 2010). Other studies also show that the location of the devices at home, particularly in children's rooms, makes the parental supervision and guidance of children more difficult. (Nikken and Jansz, 2013).

Moreover, research about parental mediation has shown that parents vary their strategies according to their perception of the effects of media content on children. Thus parents who are very concerned about the risks associated with the use of the media adopt more restrictive behaviors, monitor more closely and talk more with the children about the activities and the media content. When parents believe that the media promotes educational opportunities, they are less restrictive, and they use them together with the children and discuss with them their content in a more educational perspective (Sonck et al. 2013). On the

Table 1: Children´s new media habits

- More access to all kinds of digital media;
- More time accessing the media during the day;
- Prevalence of the strong hold of television over the media habits of young children;
- Use of the internet as an educational resource, for entertainment (games and fun), for researching information and also for social networking;
- Mobile media appears to be a technology in expansion. Kids like to use their media on the go.

other hand, if parents perceive only the entertainment role of technology, they pay less attention to the activities that they develop with the media.

Research has also shown that parents adjust their orientation to the ages of the children, demonstrating an increase in restrictive mediation with older children. As up to 8 years of age parents practice an active supervision of mediation that includes the co-use of media while the development of some activities (Nikken and Jansz, 2013).

The relationship between parental mediation and children's media skills development still needs more research, but the early studies point to a positive relationship (Nikken, 2015). When this mediation values the use of media as an educational opportunity, the children tend to develop more appropriate attitudes in their exploration.

Conclusions

In fact, because technology is so much a part of our everyday lives, parents have to work pretty hard to keep up with what's out there. But, more than knowing the latest news about applications or games, adults may need to think about how they can connect to their child during technology use. Parents need to consider their role as one of a "media mentor", a trusted adult who engages with children in the use of technology in creative and interesting ways. This sharing can lead to interesting conversations between parents and

children, promoting language development, and promoting, also, a healthy attitude about media and technology.

So, parental mediation is seen as a key strategy in developing children's skills to use and interpret the media, foster positive outcomes and prevent negative effects. Parents must know about technology's educational value, to maximize their mediation and adopt a guidance developmentally appropriate. This means providing a scaffold for the child's development. But, to better understand these questions, we also need to better understand the evolving patterns of younger children's media use. On this basis it is possible to define and organize various techniques to help parents use mediation in ways that increase media literacy skills in their children.

So, we finished this text with some research questions: *How do parents see technology? As an opportunity for learning, as something merely functional, or as pure entertainment? How does that perspective relate to their attitudes as mediators in the use of digital technologies with their children? How do different parenting practices and parents' own levels of media and technology use affect the use patterns of children in the household?*

We hope you can contribute to give answers to this questions and promote the knowledge in this area.

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Transforming pedagogy for the early years in digital learning contexts (why we have to play with toy cars before we can get a driving license)

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Abstract

The aim of this keynote address is to give an overview of how pedagogy and teaching approaches have been (mis)used in the early stages of learning – pre and primary school children – in formal and informal digital learning contexts, and examine ways of transforming these into adaptive/productive strategies that foster motivation, creativity and digital skills development in learning, while adopting selected digital tools that are not perceived as intrusive and/or displaced from the contexts of childhood education, with a view to foster and set the foundations for the development of digital literacies from an early age.

Issues that have to do with advocating or rejecting digital tools appropriation by children will therefore be addressed, based on recent research findings, allowing for the emergence of voices that are in favour or against the introduction of ICT in the early years of schooling, thus providing us with the means to equate a balanced view of the pros and cons of such introduction, be it in the form of social and economic aspects, cognitive development, parental involvement, teachers' attitudes, institutional policies, and so forth.

A few principles will be equated towards the use of the right tools for the right task at the right time.

Key words: Pedagogy, children, pre and primary school, formal and informal digital learning contexts

Introduction

The aim of this keynote address is to give an overview of how pedagogy and teaching approaches have been (mis)used in the early stages of learning – pre and primary school children – in formal and informal digital learning contexts, and examine ways of transforming these into adaptive/productive strategies that foster motivation, creativity and digital skills development in learning, while adopting selected digital

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A few principles will be equated towards the use of the right tools for the right task at the right time.

The tile we chose is twofold: the main part – transforming pedagogy for the early years in digital learning contexts – has to do with a need to address the way we educate or bring into our children's early learning contexts the benefits of technologies and how we can make these children aware of the perils they may face and render them conscious, in due course, of how to stay away form danger; the subtitle – why we have to play with toy cars before we can get a driving license – is used as a metaphor for how children acquire skills that, although not yet conceived by adults as appropriate, require children to get hold of children-adequate versions of the "real"

stuff, so that it becomes structured second nature when the time is right. This means that we are not against the introduction of technologies in the early years of learning, bur that we believe that such technologies have to be the right ones for these children. As with driving a real car, there is a long process of maturing one's brain as to concepts, principles, structures, rules, rights, responsibilities, liabilities, cautions, etc. that only come with time and are the object of evolution and change, even throughout the span of our lives and beyond.

As a child, I remember plying with toy cars, manipulating them while fantasising about manoeuvres, car crashes, doing slides, and all this by moving them around with my hands, building black cardboard aerial views of streets, miniature traffic sign posts, of which I knew the meaning of STOP, etc. I also remember "driving" a small car with pedals, and simulate the noises of the engine starting, running, shifting gears, breaking, sliding… Later, as a young adolescent, I would control a race-car with a wired track, and compete with playmates. As an adolescent, I would pay attention to what drivers did, make connections between what they did and the traffic signs they reacted to, and when something wasn't quite clear, I would ask why. Then I took my motor trike driving license – I had to study the traffic code, and one of my brothers in law taught me how to use the trike in an open safe space. After this, I went, back in those days, to an official municipal yard where a simulation of streets and traffic signs where displayed. Then, in

the presence of an examiner, I had to follow instructions as to where to go, where to turn (some times with trick instructions, to which one had to react according to the signs and disobey the instruction, if that was the case), and I got my permit. Then came the experience of being on my own, in real life situations, having to deal with real traffic, with breakdowns, and fortunately, also with small accidents. After that came the car driving license, with a bit more complexity, but all the accumulated prior knowledge played an important part in doing it with ease.

As a father, I watched my children, still while babies, picking up toy cars, putting them in their mouths, moving them about in their little hands, dropping them, and grabbing some other toy, and do the same all over again. Later, when they became toddlers, they would behave the same way I did, usually with a car in one hand and, in all fours, move about the floor making engine noises and drooling a lot while at it. After that, the same sort of behaviour, only this time they started with street mats and toy cars, remote control cars of all shapes and sizes, electric powered scooters, PlayStation driving simulators, etc. The rest was pretty much the same, and as a grandfather, I notice that there are no big differences from my children, except for the experiences in 3D. But I honestly believe that when it comes to driving licences, and especially in the case of my grandson, cars will drive themselves… I feel like retaking, on this issue, Shakespeare's comedy title "Much ado about nothing", whose first folio he published back in 1632. Therefore, we all have to take these matters with a good dose of sensibility and a pinch of salt.

How pedagogy and teaching approaches have been (mis)used in the early stages of learning: an overview

Be it nationally or internationally, early years' education has recently been recognised as a stage of children's learning and development that should be supported by a curriculum structured around the concept that the child is a whole and complex being and, therefore, requires teachers and educators that address their needs in an adequate manner. And this adequacy means moving away from methods and strategies that are sustained by the concept that one size fits all. In fact, the OECD, in 2001, makes such a recommendation.

As in most countries, when we talk about early stages of learning, we mean any child from that is in the naught to eight years of age, although when referring to compulsory or statutory education, some countries vary in how they look at the starting age (Northern Ireland with 4; England, Malta, the Netherlands, Scotland and Wales with 5; Austria, Belgium, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Iceland, Republic of Ireland, Italy, Liechtenstein, Luxembourg, Norway, Portugal, Romania, Slovakia, Slovenia, Spain, and Turkey with 6; and Bulgaria, Estonia, Denmark, Finland, Latvia, Lithuania, Poland, and Sweden with 7). As

it happens, the early stages of learning, where the very beginnings in the past was the responsibility of parents, nannies or tutors, evolved to learning provided in pre-school years by nurseries and kindergartens, an issue that cannot be dissociated from the need working parents have to leave their children in trustworthy hands, while they're at work, either because they actually think that this is the best for their children's development, or because it is the law. For example, in the UK, almost 100% of children in England enter what is referred to as "reception classes" in school contexts from the of age 4 years and 4 months onwards, which is about one year early that statutorily demanded. In the Republic of Ireland, and also in other countries like Portugal, although the start of primary education is not compulsory until the age of 6, most children are placed in school environments two years in advance, and follow a national or locally prescribed curriculum. Although there are differences in the approaches adopted in these early stages of learning, whether more formal subject-oriented and teacher-led, emphasising numeracy and literacy – i.e. basic maths and reading/writing, already aiming at the development of competence and mastery of the "mechanics" of cognition through mim-mem and repetition –, as opposed to a more informal, play-oriented and child-centred approach, where children are seen as beings that should develop autonomy, initiative and creativity – through play, responsible choice, and interactive activities that are either led by the teacher or proposed by the child, with large investment in activities that foster discovery (deduction by observation) and real life situations problem-solving. The movement from the first approach to the latter has been observed in view of the criticisms made to the first, and most countries have followed, or are following suit, with variations that are socio-culturally based, and that in the UK have adopted the designation of Foundation Stages – at least in England, Northern Ireland and Wales –, all concerned with smoothing the transition between informal and formal education.

As far back in time as 2002, Bertram and Pascal, came up with a set of principles that apparently were consensual as far as the data obtained internationally from 20 different countries is concerned (Australia, Canada, England, France, Germany, Hungary, Republic of Ireland, Italy, Japan, Korea, the Netherlands, New Zealand, Northern Ireland, Singapore, Spain, Sweden, Switzerland, USA, Wales, and Hong Kong). These principles were, for 3 to 6 year-old children: "a child-centred, flexible and individually responsive curriculum; the importance of working in partnership with parents; the need to offer broad and relevant learning experiences in an integrated manner; the importance of play and active, exploratory learning; an emphasis on social and emotional development; and the need to empower the child to be an autonomous, independent learner" (Bertram and Pascal, 2002, p.21). The keywords are all there: child-centeredness; flexibility; collaboration with parents; broadness, relevance and

integration of experiences; play and active exploration of the environment; socio-emotional development, empowerment, autonomy and independence for the child.

Ways of transforming early learning strategies into adaptive/ productive strategies

According to Bredekamp (1987) and Bredekamp & Copple (1997), the NAEYC guidelines for developmentally appropriate practice (DAP) were originally based on developmental theory, with a focus on Piaget's cognitive constructivist perspective rather than on that of Vygotsky's social and cultural contexts of development. The DAP guidelines (NAYEC, 2009)[2] now includes both perspectives in the 12 principles of learning and practice[3] that derive from up-dated theoretical and empirical accounts of developmental processes and sociocultural influences.The 12 Principles of Child Development and Learning are:

- All areas of development and learning are important.

- Learning and development follow sequences.

- Development and learning proceed at varying rates.

- Development and learning result from an interaction of maturation and experience.

- Early experiences have profound effects on development and learning.

- Development proceeds toward greater complexity, self-regulation, and symbolic or representational capacities.

- Children develop best when they have secure relationships.

- Development and learning occur in and are influenced by multiple social and cultural contexts.

- Children learn in a variety of ways.

- Play is an important vehicle for developing self-regulation and promoting language, cognition, and social competence.

- Development and learning advance when children are challenged.

- Children's experiences shape their motivation and approaches to learning.

These principles purport to how individual variation in development and learning should be linked to decisions about the curriculum, teaching and interactions, so as to guarantee that educational decisions are taken on the basis of the unique character of each and every child, and also of group differences such as nature, growth rate, personality and background of its members. Of course, to balance things out, other principles have to be called upon to give weight on developing children in such a way as to making them emotionally literate and aware of safe and positive means and attitudes towards how to interact and

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[2] The Developmentally Appropriate Practices (DAP) framework was developed by an USA professional body, the National Association for the Education of Young Children (NAEYC), for professionals who dealt with children from 0 to 8 years of age.

[3] Retrieved from http://www.naeyc.org/dap/12-principles-of-child-development, 12th May 2016.

respond to adults, social interactions, multicultural contexts.

Having in mind that play, as a concept, has long been the subject of observation, register, description and research, Stephen (2010) states that the role of reviewing the contribution of play to learning and teaching does not have the intention of rejecting it but, on the contrary,

> to strengthen its place as a medium for learning when that is most appropriate, to ensure that the play opportunities offered to children are playful and engaging to them and to develop a more nuanced and evidence-based rationale for play in the learning environment that is clear about the benefits and can go beyond an appeal to consensus and historic claims to distinctiveness (Stephen, 2010, p. 4).

Free play — e.g., activities initiated and freely chosen by the child and maintained without the interference of an adult, be it a relative or an educator — was usually privileged as the elected form of play, and highly valued by early years' educators. For instance, Bruce, as early as in 1991, suggested that play is a too broad a word to be of any use and only 'free-flow' play could actually render evident the nature and boundaries of the concept. In her view, play is a unique form of activity that cannot be imposed: nobody can force children to play. While observing children in nurseries contexts, Meadows and Cashdan (1988) observed that when children are busy and happy playing without interference form adults, conversation or play with adults, high complexity play activities, or even play leading to a purpose, were very scarce. Earlier on, in 1984, Sylva observed that UK and US nurseries showed that some play activities were far more reaching and enriching of children' learning (especially as far as exploration, creativity and problem-solving) than others, particularly when such activities involved art, puzzles, games and materials for manipulation and construction of something, contrasting with some other more common activities like playing with dough or sand and dressing-up as a different character. She observes that the play partner is more important that the materials they play with, with an emphasis on the "sensitive adult" that takes the child deeper into play by talking about and reflecting upon the activity at stake.

Although there has been a decrease in births in the last few years in Portugal, and in spite of such figures being presently at a turning point, the fact is that many more children attend pre-school, a phenomenon that is also happening elsewhere. And the problem resides in an aspect that, with the inception of this other lair of schooling, a further transition issue is faced by children, i.e. that of moving from unstructured (or ill-structured) pre-school, to an ever increasing number of structured schooling cycles represented by compulsory education, however play-driven the very first few years of primary education may be. Studies have isolated some important issues as far as transition is concerned: (i) personality traits, socio-economic background and prior knowledge and how these may facilitate or hinder transition; roles of parents and family, of peers and of the school community; role of the educators and the school itself. The Dynamic Effects Model proposed Rimm-

Kaufmann and Pianta in 2000 supports the principles of constant interplay between all actors – child, educator, other children and parents, accounting for the provision of clues, namely to the educator, as to the children that may have more or less trouble adapting to the new context, and finding support from the other interveners (parents, family, friends, community members, etc.) to get involved in the process.

Rachel Trost, an occupational therapist, is very blunt and straight forward, when she states that "Children learn about their world through play and imitation of adults, and play is much more motivating than sitting at a table completing worksheets" (Trost, 2011)[4]. And she lists a few skill areas that are target by playing with cars:

> Cognition while playing with cars:
> • Experiencing cause and effect relationships, such as when a car drops down a ramp
> • Labeling basic parts of a car
>
> Fine Motor or Hand Skills while playing with cars:
> • Strength[en]ing hand-eye coordination skills and improving hand dexterity while building a toy car.
> • Improving hand coordination and hand dexterity while repairing a car using toy tools.
> • Practice using both hands simultaneously while turning a steering wheel
>
> Gross Motor or Whole Body Skills while playing with cars:
> • Improving strength and coordination while climbing in and out of child-sized car
>
> Speech and Language while playing with cars:

> • Vocabulary:
> – Parts of a car:
> • Wheels
> • Buckle
> • Steering wheel
> • Seat belt
> • Door
> Early Learning Concepts while playing with cars:
> – go/stop
> – fast/slow
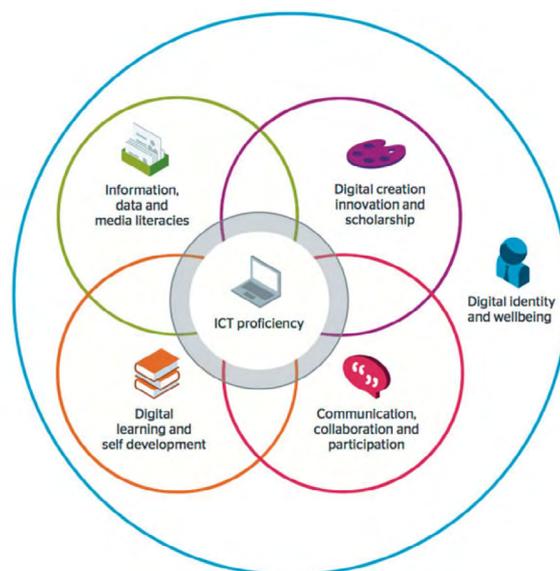> – on/off
> – up/down
> – smooth/bumpy

And Marissa Edwards, in reply to Rachel's post, adds a few more to these: "there is so much that they can learn that is inherent to the activity. I also find that when kids crawl across the floor while pushing a car, they are also developing their arm strength and stability, their shoulder strength and stability, trunk control, and developing the muscles in their wrists and hands in preparation for higher level tasks as they get older. I see a lot of creative play, and ideation that comes out of playing with cars, too. I have also used different toy cars to work on matching colors and identifying colors. Kids can be so motivated by toy cars or trains that they are very willing to engage in new skills or challenging tasks when their favorite car is involved in the process!

The examples above are clear and go along the lines of my argumentation. Many more can be found on the Web that offer not only views on this issue but also thousands, if not millions of guidelines and teaching ideas for adapting, adopting or putting into practice. And this goes without saying that most software / web tool developers have onsite instructions, examples and ideas on how to use their tools. I am thinking, for instance, about Jisk[5], that has precisely that sort of free service, and I find their definition of digital literacies quite tempting, and

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[4] Retrieved from http://nspt4kids.com/parenting/developmental-skills-while-playing-with-cars/, 26th May 2016.

[5] https://www.jisc.ac.uk/guides/developing-students-digital-literacy, retrieved 16th May 2016

Figure 1. Digital capabilities: the six elements.

therefore do not resist quoting: *"We define digital literacies as the capabilities which fit someone for living, learning and working in a digital society.[6]"* And this is followed by a self-explanatory diagram which I also take the liberty of sharing in Figure 1[7].

Advocating or rejecting digital tools appropriation in early years learning

Advocating

Many early childhood educationists are very critical and fiercely fight the critical approach come to be known as the Fool's Gold. Authors such as Linderoth, Lantz-Andersson & Lindstrom 2002 or even Luke 1999 express their uneasiness as to the possible damages and dangers that can be imparted on children at various levels, be they cognitive, emotional, physical or even

social, brought about by the so-called new technologies. I apologise for what I am going to do, but I have not seen it as clearly put as Jisc[8] has done. So, here goes this very long, but extremely rich quotation:

Computers can play a role in young children's early childhood education experiences alongside many other kinds of activities – ICT should not be seen as a way of superseding or displacing these kinds of experiences. For example, ICT use should not be at the expense of outdoor or indoor experiences which promote development of gross motor skills through running, climbing, jumping, swinging, and using wheeled toys (Siraj-Blatchford & Siraj-Blatchford 2003). Researchers caution that computer use should not be seen as a stand-alone activity, but should be integrated into other planned and spontaneous learning and play activities within the early childhood education classroom. Liang & Johnson (1999) described ways in which computers can be used in activities they label as investigative play, functional play, games with rules, pretend play and constructive play. Using ICT in the early years can foster

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[6] Bold in the original.

[7] See footnote 4.

[8] See footnote 4.

development of communication skills among young children. Van Scoter & Boss (2002) have illustrated many ways in which ICT can make rich contributions to children's literacy development, in the four interrelated areas of speaking, listening, reading, and writing. For example they have discussed how "talking" word processors support young children's experimentation as they play with language. They highlight that these tools offer possibilities for children to compose and write without needing to have mastered the production of letters by hand. They also suggest using computers and printers to help children make signs, banners, and other props for pretend play, all of which will add interest and basic literacy skills to children's play and decisions involved in making them will give children opportunities to use language. Moreover, this whole exercise of preparing and displaying printed products will create an atmosphere for children where print has direct relevance to their lives. Technology when used thoughtfully and innovatively can help children express themselves, verbally, visually, and emotionally. ICT provides a variety of ways for children to weave together words, pictures, and sounds, thereby providing a range of ways for children to communicate their ideas, thoughts, and feelings. ICT can support writing for young children as well as reading or pre-reading skills. ICT can hone children's storytelling skills such as even children who are not yet writing could dictate words to go with their pictures, or they could record their voices telling the story, or be videotaped as they tell the story and show the picture. Some studies have shown that ICT use in the early years do have the potential of fostering development of social skills in young children by providing a forum for collaboration, co-operation, and positive learning experiences between children, or between children and adults. This however requires that the practitioners must be conscious of the kinds of learning interactions they would like to induce in the context of ICT use and adopt suitable teaching methods to support these. Other studies suggest that ICT use facilitates social development also by encouraging communication between children, turntaking and collaborative problem solving. However there are only a few good, recent studies available to substantiate this for pre-school children in particular. Nevertheless, sitting with others using a computer, talking and sometimes enjoying an animation together are positive social experiences for the children. Regarding effects of ICT on learning, Haugland (1992) offered evidence that children who had experience of computer use made developmental gains in non-verbal skills, structural knowledge, long-term memory, manual dexterity, verbal skills, problem solving, abstraction and conceptual skills. Also, some research using case studies have shown that ICT can be used to support aspects of learning including language development and mathematical thinking. Lewin (2000) explored the effects of talking books software in UK primary classrooms (focusing on 5- and 6-year-olds) and concluded that electronic books can complement teaching in infant classrooms, having a positive effect on cognitive and affective outcomes.

And again, as to reasons for rejection of digital tools appropriation[9]:

Rejecting

The increasing pervasiveness of ICT has led some parents, teachers, and children's advocates to question its relationship to the cognitive, emotional, social, and developmental needs of young children. More often than not, the argument is focused on young children's use of computers and computer games and questions are raised on two accounts. Damaging effects of ICT tools on young children are: *Harmful physical effects of prolonged computer use by children; *Negative effects on children's social development (such as promote anti-social behaviour like isolation or aggressive behaviour); and *Developmental concerns (such as computer use can interfere with children's cognitive development). Specific concerns about the potential harm ICT tools can cause are: *Exposure to unsuitable content (such as material of a sexual or violent nature, or containing inappropriate gender, cultural, or social stereotypes); and *Computer use may

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[9] See footnote 4.

displace other important learning and play activities. Some researchers condemn introduction of ICT in the early years on the premise that it is damaging to the development of children in all aspects – physical, cognitive, social, and emotional. Most research on ICT and its impact on young children have focused on the use of computers by them. An argument opposing early introduction of ICT is that as children learn through their bodies, computers are not developmentally appropriate (Haugland 2000). As a screen-based medium, activities at the computer are not as effective as manipulatives in developing understanding and skills in the early years (Yelland 1999).

Hohmann (1998) stated that, except for the coordination involved in using a mouse, computers do not support the development of motor activities or motor skills development. He goes on to assert that, although touch typing is a motor skill that can be learned with the help of a computer, it is inappropriate for most children to begin this before they are about 7 or 8. Critical about computer-use in early childhood years, Elkind (1996) stated that computer proficiency does not mean cognitive development, the latter requiring evidence of the development of an underlying concept. He points to the difference between knowing how to use the internet and learning something from it. Healey (1998) cautioned that

use of computers is damaging to young children's development as well as their learning. Stating that young children need human support and verbal interaction, she concluded that as computers fail to offer intersensory experiences to enhance learning, they are inappropriate as an educational resource for children below the age of about 7 years as using computers before the age of 7 'subtracts from important developmental tasks'. Fomichova & Fomichov (2000) added another dimension to this debate by suggesting that children in economically developed countries spend so many hours alone in front of the computer that a new non-nuclear family system of parents, children and computer has emerged. They refer to the computer as 'intrusion' into the educational system, children's cognition and the family. Yet others believe that computer use might foster learning in a negative sense. For example, solitary game play on computers could lead to

children's isolation from social interaction in learning and play, or that violence in computer games could encourage aggressive behaviour. A common concern expressed by most critics is that ICT might displace other important learning and play activities. In fact, Cordes & Miller (2000) call for an immediate moratorium on the further introduction of computers in early childhood, except for special cases of students with disabilities. They take the view that children's use of computers should be sidelined in favour of other kinds of learning and play activities. They argue that computer use in early childhood education should be abandoned in favour of the essentials of a healthy childhood. Other concerns surround the health and safety issues of computer use for young children, research-based evidence about which is inadequate. For instance, there is not enough information on whether or not the radiation emitted by wireless ICT technologies could have harmful health effects for adults and children. There are also concerns about the physical effects of prolonged exposure to ICT, such as repetitive strain injuries, addiction and sedentary lifestyles. The BECTA (2001) information leaflet on keyboard skills in schools states that for children with years of typing ahead of them, using the keyboard with index fingers only is highly risky, especially when there may be added strain from playing games on home computers. Moreover, little is known about the possible addictive nature of the internet and computer games on young children, as available information so far is limited to only older children.

A few principles for the use of the right tools for the right task at the right time

NAEYC (2009) propose a set of principles (Principles of child development and learning that inform practice) that, to my mind, still make all the sense when thinking of putting into practice our ideas of bringing young children into touch with ICT, as far as their education, in the full sense of the

word, is concerned. And these twelve principles are (NAEYC 2009, pp.11-16):

• All the domains of development and learning – physical, social and emotional, and cognitive – are important, and they are closely interrelated. Children's development and learning in one domain influence and are influenced by what takes place in other domains.

• Many aspects of children's learning and development follow well documented sequences, with later abilities, skills, and knowledge building on those already acquired.

• Development and learning proceed at varying rates from child to child, as well as at uneven rates across different areas of a child's individual functioning.

• Development and learning result from a dynamic and continuous interaction of biological maturation and experience.

• Early experiences have profound effects, both cumulative and delayed, on a child's development and learning; and optimal periods exist for certain types of development and learning to occur.

• Development proceeds toward greater complexity, self-regulation, and symbolic or representational capacities.

• Children develop best when they have secure, consistent relationships with responsive adults and opportunities for positive relationships with peers.

• Development and learning occur in and are influenced by multiple social and cultural contexts.

• Always mentally active in seeking to understand the world around them, children learn in a variety of ways; a wide range of teaching strategies and interactions are effective in supporting all these kinds of learning.

• Play is an important vehicle for developing self-regulation as well as for promoting language, cognition, and social competence.

• Development and learning advance when children are challenged to achieve at a level just beyond their current mastery, and also when they have many opportunities to practice newly acquired skills.

• Children's experiences shape their motivation and approaches to learning, such as persistence, initiative, and flexibility; in turn, these dispositions and behaviors affect their learning and development.

Given this set of principles, and to conclude this text, it is my honest belief that any well prepared educator, willing to learn and invest time and effort into finding the right ways and partners to pursue and persist in adopting and adapting technologies with the help – and especially answering the requests, even the "disguised" ones – of the children they are in charge of bringing up as autonomous and critical learners, is an invaluable contribution for them as responsible citizens.

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Reading to learn on screens. Challenges for research[1]

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Abstract

Reading on screen is the subject matter at issue, focusing on online reading to build knowledge and learn. I begin by defining core features of digital reading, taking the essential characteristics of reading on paper as a reference point. I identify and discuss some of the potentialities and requirements established by digital reading at the meaning-making process level. Eventually, I examine the most relevant research questions that emerge from the discussion for DigiLitEY.

Key words: reading on screen, meaning making, multimodality, interconnectivity, interactivity

Introduction

Reading on screens is one of the objects of study established by the DigiLitEY project, aiming to research into literacy practices of young children (Sefton-Green, Marsh, Erstad & Flewitt, 2016). Digital reading carried out by these children unambiguously comes up as the result of a complex surge of social and technological developments which define the modern communicative context (Kress, 2010). The necessity to understand this facet of contemporary life, as assumed in DigiLitEY, is due, in the first instance, to the creation and sociocultural value of new means of communication and of dissemination of information. Knowing and examining young children's digital reading becomes an imperative to better promote the development of a required cultural competence for the future of these children.

At first glance, reading on screens is an easy and engaging activity (also) for small children. In fact, observing how children, literate or not, make sense of digital texts available on computers, tablets or mobile phones, makes one realize the ease of engagement and pleasure taken by youthful readers. Reading on screens seems, to that extent, to have advantages over reading

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'on paper', which is developed relatively late, and then often difficult and painful, particularly when one thinks of reading written texts to build knowledge and learn. However, digital reading is not free of danger and requirements (also) for small children. Actually, reading on screens can easily become closely related to 'random TV watching', a fragmented, casual, and careless meaning making process, and with the construction of potentially fragmented and transient learning.

Reading on screens to learn seems therefore to be a complex experience, and it is the matter for discussion in this paper. My goal is to further contribute to building an understanding of the subject at hand, considering the main challenges posed to the DigiLitEY project.

The perspective I share is indeed limited since I only have in mind the activity of reading digital texts available online, and being read on different media to build some type of knowledge, although some highlighted perspectives might probably be relevant to other forms of digital reading carried out in different digital media and configured (or not) in the context of Web 2.0. On the other hand, my discussion is conducted with close reference to a cognitivist perspective, which only accounts for one among distinct possible perspectives in the building of a full understanding concerning the matter at issue (cf. Coiro, 2015; Jewitt, 2008; cf. Cope & Kalantzis (2000) for New Literacies, Multiliteracies and associated concepts). Nevertheless, I do consider this perspective

to be of great interest in the understanding of the complexity of digital reading.

I begin by synthesizing some of the key notions about paper reading so that a basis for understanding can be built for the analysis of digital reading I do afterwards. Then, I identify and define three major features of digital texts and I discuss the main potential they show for reading to learn. Next, I discuss the risks the same features pose to digital reading, which impose great demands for digital readers. The discussion is concluded with some research questions, which I consider most important in the context of the DigiLitEY project.

Reading on paper

Cognitive views of reading "on paper" tend to converge on the definition of reading as a meaning-making interactive process, which takes place between a *reader* and a *text* in a given *context* (Irwin, 2007). Taking this into account, and in general terms, the *context* creates the conditions of reading, making it necessary, hence bringing about aims and objectives that are crucial in the reader's motivation and engagement; the written *text* is the object of the reader's meaning-making activity; *the reader is the meaning-making agent* who mobilizes not only his language knowledge, and his emotional and background knowledge, but also, and essentially, *a set of specific mental processes* to construct a mental representation (that is, his understanding) of a text. The activated processes entail:

. Comprehending written representation

These are basic operations in the meaning-making of the written text: identifying written words, parsing (that is, grouping sequences of words into meaningful syntagmatic units) and sentence understanding; establishing meaningful relationships between sentences and inferring meanings; understanding the meaning of the text as a whole, including the identification of the issue, main ideas, the text structure, and the costruction of a synthesis of textual information. These processes are closely dependent upon the linearity and unidirectionality of the written language as well as upon the delimitation of written texts and text genres.

. Elaborating on personal meaning

In understanding the written text, the reader actually goes beyond the text itself, elaborating unforeseen and unpredictable meanings, which are only attributed to one's own individuality. Text reading involves, for instance, the reader's previous knowledge and experiences, the reader's emotions, the ability to visualize and to anticipate as well the critical positioning to the text. This latter process is called up when the reader, for example, questions the source of the text and the author's purpose, so as to avoid ideological bias, and /or prevent inaccuracy and partiality of accessed information. Meanings thus construed are also part of the mental representation every reader builds of the text being read.

A cognitivist understanding of reading assumes that these two types of making meaning processes are inextricably called up to the reader's mind, making the reading of any text into a literal, inferred, organized, synthesized, and personally elaborated set of meanings. However, this process of making meaning to oneself may also activate a different type of mental processes related to metacognition.

• Monitoring the process of making meaning

These processes are triggered in the reader's mind whenever he/she needs to control the meaning – making process. Contrariwise to the previous ones, these are conscious processes involving the reader's attention and thinking over the reading activity. Such a control is due to different reasons. One of the most common processes of reading control is related to solving comprehension problems. It has to do with processes that are mobilized to find out the unknown meaning of words, for example, or to overcome incorrect processes of sentence parsing and word chunking. Besides, another further set of processes is also called up, allowing the reader to control the reading process and be able to learn from it. In this case, the reader focuses his attention and thinking on the reading process so that he may identify, select, (re)organize, and synthesize relevant information regarding his reading purposes, which he/she consciously integrates in his/

her previous knowledge to build more meaningful knowledge and therefore learn (Irwin, 2007).

Reading on screen

This more or less consensual model of reading "on paper" is currently unable to fully explain digital reading, particularly the kind of digital reading related to learning. It is clear to me that there are similarities between print reading and on screen reading. In fact, the act of reading does not seem radically different for both types of communication contexts (on paper and digital), since reading is in each case synonymous with *making meaning of the available information*. Moreover, I have no reason to think that the *kinds of meanings* constructed is not similar for the two types of communication contexts, as they are *thought and created by the same mind in both contexts*.

However, the dissimilarities between paper-based reading and digital reading are indisputable, and from my point of view these are mostly based on the fact that, in the context of digital communication, a new textual unit is implied: *the digital text*. As I see it, the understanding of digital reading may therefore consider *cognitivist tenets* but needs crucially to take a close consideration of this new object of meaning making. The digital text displays different characteristics from text on paper, featuring significant impact on the meaning-making processes required for the reader to build

the represented meanings, especially when learning is the purpose of reading. In the following section I identify three detached characteristics of the digital text, examining, in each case, their implications in supporting the meaning-making processes activated by the digital reader. This is followed by the discussion on what may be considered procedural requirements triggered by those characteristics.

Digital text: features and gains in the meaning-making process

Multimodality, interconnectedness and interactivity are the most prominent features of digital text. Together, they significantly alter the construction of the meaning-making process involved in reading texts 'on paper', offering auspicious possibilities for meaning making.

Multimodality

Modes comprise the material resources for making meaning in texts, stemming from cultural development, and made available in a given social context (Kress, 2003, 2010; Bezemer & Kress, 2016). There are several meaning-making modes: written language, spoken language, still image (illustration, photography), moving picture (video), colour, layout (arrangement of data in a given space), sound, music, touch….

Though not exclusive to them, multimodality is a fundamental characteristic of digital

texts. According to Kress (2003, 2010), the simultaneous availability of this type of resources, made possible by digital media, was responsible for catapulting a multimodal trend that has been observed for decades in the communication field.

In digital text, the various modes are 'meaningful', being used to represent meaning. However, one of the great principles of multimodal text composition concerns the partiality and interdependence of the modes that are used: all modes are partial and all of them are complementary in the process of making meaning:

> Different modes offer different potentials for making meaning. These differing potentials have a fundamental effect on the choice(s) of mode in specific instances of communication. (Kress, 2010:79). "No one mode stands alone in the process of making meaning; rather, each plays a discrete role in the whole" (Jewitt, 2008: 247).

This means that each mode is used according to its specific potential for making meaning, not aiming at duplicating, illustrating or embellishing meanings represented by other modes (Bezemer & Kress, 2016; Jewitt, 2005, 2008; Kress, 2003, 2010). In general terms, speech and writing, associated to the power of authority, are mainly used to name; images and photographs (still images) to display/show not only entities and facts, but also processes in a static way (for example in graphics), allowing for the illustration of information of a more abstract nature (e.g., concepts); filsm, videos, animations (moving image) is used to display/show dynamic processes throughout time and space, and the actors involved; layout is used to distribute and arrange the elements on the screen, thus conveying meaning (e.g., centrality or marginality), as well as the meaning of relations between the elements that are simultaneously and discontinuously represented on the screen (see Kress, 2010:92).

Among the numerous modes used in the construction of digital texts, the screen openly favours the exploration of those associated with image: still image, moving image, and layout. In fact, it is acknowledged that, in digital contexts, the hegemony of the written language is set away in favour of visual modes, becoming one among the many modes in the construction of meaning, and even being subdued by the prevalence of the latter modes (Kress, 2003, 2010; Jewitt, 2005, 2008).

This reveals how multimodality redefines the text in the digital context, which is now represented as *a multimodal symbol-saturated environment* (Jewitt, 2008: 259). Digital texts are *multimodal ensembles* (sets of modes), orchestrated in the construction of a meaningful set:

> Ensemble, in this context, names an emphasis on *modal multiplicity* of the text, while *orchestration* names an emphasis on the *aptness* of the selection, the mutual interdependence and the 'semiotic harmony' of such elements (Kress, 2010:157, original italics).

Furthermore, the multimodality of digital texts radically alters the linearity and the unidirectionality of the organization of information represented in the conventional written text, setting up a novel, discontinuous, and multidirectional text:

> In *image*, meaning is made by the positioning of elements in that space; but also by size, colour, line and shape. Image does not 'have' words; it uses 'depictions'. (…) Meaning relations are established by the spatial arrangement of entities in a framed space and the kinds of relation between the depicted entities" (Kress, 2010:82, original italics).
> "*Writing* is newly organized by the demands of the spatial logic of the visual mode which dominates the 'screen'" (idem: 170). "The visual character of writing comes to the fore on screen to function as objects of literacy in fundamentally different ways than it does on page (Jewitt, 2008: 257).

The multimodality of digital texts brings with it a transformation reading processes. Research has been showing that multimodality has a potentially positive effect on the mental process of making meaning. Such effect is credited to the fact that additional sensory modes are activated in the comprehension of multimodal texts (Mayer, 2001; Moreno & Mayer, 2007), especially visual and auditory modes, which seem to recover basic pathways of input in the reader's brain, biologically operational long before the cultural development of written language. The advantages that the simultaneous activation of these sensory modes offer to the reader in his/her efforts to make meaning are likely to be the reason behind its popularity.

Interconnectivity

Interconnectivity is comprised in the potentially infinite set of textual interfaces associated with the digital text, as it is virtually connected to other texts via the hypertext. This broadness of digital texts, established by interconnectivity, amplifies the flexibility and fluidity of texts allowed by multimodality, as opposed to texts on paper, which are self-contained, closed, and static within their limits. Additionally, the immediate link to other digital texts, with which the reader can immediately engage, makes reading a deeply social act, thereby permanently renewing the typical individual reading process that is strictly maintained between the reader and the paper-based text (Salmerón & García, 2011).

The interconnectivity of digital texts provides the reader with access to a wide range of potentially enriching information concerning the quality of meanings it enables to build (Coiro, 2011). Contrariwise, when reading 'on paper', this possibility is completely dependent on the reader's current knowledge (Eco, 1987), while being much slower (and sometimes remote). The availability of other sources of information in digital text interfaces allows readers to draw inferences (through the access to essential information, previously unknown to the reader), as well as integrate and elaborate

on information (Coiro, 2011; Salmerón & García, 2011).

Interactivity

Digital texts incorporate the possibility of *intervening* upon texts, more specifically of *acting in the inside and towards the outside of texts*. Thus, the multimodal, interconnected digital text promotes a kind of understanding by doing (cf. Learn by doing, Moreno & Mayer, 2007). This *understand-by-doing* allows readers to find their own reading path (as well as their own pace) within the text. Readers choose that path among multiple portals (Jewitt, 2008) opened by the multimodal discontinuity on the screen, they themselves determining the order in which to proceed. As referred by Kress,

> Placement of the elements does not determine the order of 'reading-as-engagement'. 'Reading' is now a matter of the design of the 'page' or the 'screen' by the reader" (2010: 175.16); "The ensemble offers a choice of routes for making meaning in interpretation" (Kress, 2010: 165)).

In addition, readers can expand *this path* by following the multiple 'outside doors' provided by the interconnected text, seeking information, selecting and controlling their reading pace on the available textual interfaces (Jewitt, 2008; Moreno & Mayer, 2007; Kress, 2010). Research has revealed a potential powerful connection between being able to 'navigate' proficiently using the navigation map found in the hypertext and readers'

ability to integrate the information distributed across different texts (Salmerón & García, 2016). Such results seem to be in line with findings regarding a well-established relationship between navigation and performance in online tasks coming from international student assessments such as PISA:

> There is clear evidence that students' navigation, as indicated by their traces in log files, play a major role in online question-answering tasks (Organization of Economic Co-Operation and Development [OECD], 2011). Specifically, a large scale study involving the adolescents participating in the OECD Programme for International Student Assessment (PISA) 2009 electronic reading assessment revealed that students who displayed a more task-oriented navigation behaviour, as indicated by more visits to task-relevant pages, correctly responded to a higher number of questions (Naumann & Salmerón, 2016: 43).

As such, *interactivity* makes of the reader the actual composer of the digital text. Besides, the interactivity of the digital text is also materialized in its own effects upon the reader. The digital text is able to "supervise" the activity of the readers by *supporting/guiding/providing feedback* on the decisions and responses of readers (Moreno & Meyer, 2007).

Together, the whole template of possible actions provided to readers as well as all the feedback configure a sort of *scaffolding* to the meaning-making process that takes place on screen. The dynamism thus set in the process of digital reading is non-existent

in paper-based reading, thus completely transforming the conventional process of interaction between readers and printed texts.

Digital text: requirements for meaning-making processes

The same features that are responsible for the meaning-making potential of digital texts pose a very significant set of requirements to digital readers. These consist of *new* and *renewed* procedural requirements when compared to the requirements placed by printed reading. Besides, should the required processes not be activated, the digital text meaning-making potential can eventually incur in "losses" respecting the meaning-making process associated with reading on paper (Kress, 2003, 2010).

New processes

Digital text readers need to know how to deal with the abounding multimodal meanings available on screen. According to Jewitt, "When using learning resources that demand the interpretation of movement, image, and colour, students are engaged in a complex process of sense making" (2008: 258). This means that readers need to resort to processes such as:

. Understanding multimodal representations

Digital text readers must understand multimodal representations, "a broad range of multimodal systems and their design" (Jewitt, 2008: 261). This requirement involves the need to make use of semiotic codes associated with colours, sounds, music, screen layout ... to make meaning out of them. In digital text reading, the reader must therefore know the multimodal codes and conventions of meaning-making in order to be able to make literal meanings from such codes, as well as infer, relate and integrate the represented meanings into a coherent and organized (mental) whole (Kress, 2010; The New London Group, 2000).

This ability is critical to prevent cognitive saturation, which occurs with the simultaneous convergence of excessive information in a single input pathway in the brain, as can happen when multiple modes associated with image are used in the text (Moreno & Mayer, 2007). From this point of view, making meaning from multimodality is a new ability in the context of cognitivist reading theories, although being already known in broader contexts, such as the ones associated to socio-semiotic theories of communication (Kress, 2010).

Renewed processes

In addition to the aforementioned 'new' capability, digital reading for learning brings about the need to activate *in a radically new robust manner* reading processes already

involved in paper-based reading. As Naumann & Salmerón point out,

> traditional or offline comprehension skills are needed to process the documents accessed through the navigation process (e.g., Salmerón & García, 2011). This means that in online learning scenarios as well, students need to decode words, parse the syntax of sentences, and execute local and global coherence processes to finally understand a document's contents (e.g., Kintsch, 1998) (Naumann & Salmerón, 2016: 43).

In this text, emphasis is however placed both on the activation of elaborating processes related to critical questioning of the made-available texts, and on metacognitive processes that sustain the conscious process of learning.

. Critical questioning of texts

The ease of production, availability and access to digital texts require that readers take on a very inquisitive attitude towards the quality of information and the author's purpose. The sheer amount of texts that readers have at their disposal may represent inaccurate or incomplete information, while the intentions of the author may not always be of "pure" sharing. Critical questioning ability is therefore essential for the readers to avoid assumptions associated to these limitations, or being subjugated to a potentially biased and 'dangerous' perspective (Coiro, 2015). The limitation and manipulation digital texts covertly enact upon digital readers can also be recognized

in their self-imposed limits, such as pre-set templates (Kress, 2010: 193). Although providing a kind of scaffolding to the reading process, as discussed above, these pre-set templates may also determine the limits of the knowledge *readers* can construct. It is therefore essential that digital readers authenticate and question by *omission* all the information available to them. Sourcing, analysing and evaluating digital texts thus become essential in order to circumvent acritical information consumption and transform digital reading into proficient meaning making (Coiro, 2015).

. Self-determination on the meaning-making process

By allowing the realization of multiple immediate reading actions, the reading of multimodal and interconnected texts promotes a sense of 'control' in readers: They themselves select the texts and determine both the reading path to follow and their reading pace. Yet, the array of offered possibilities frequently dazzles readers, transforming reading into a random, confusing, and unfocused activity, and resulting in an indiscriminate collection of huge amounts of information, and/or in an incoherent patchwork of excerpts. As referred by Moreno & Mayer (2007), "By virtue of their interactivity, [interactive multimodal mixed-modality learning environments] can create excessive extraneous load that disrupts deep learning" (p. 313), which can hardly be

integrated into the readers' mental structures to build meaningful learning. Despite the potential offered by digital reading, it can thus become a rather trivial and pointless endeavour. Therefore, digital reading requires readers to learn to "move beyond information consumption to knowledge generation" (Coiro, 2015:55) by becoming consciously responsible for their reading (Moreno & Mayer, 2007; Coiro, 2015). This means that digital readers crucially need to enact metacognitive reading processes during their meaning making (Coiro, 2015; Winnie & Hadwin, 2013).

On construction of such reading control, it seems paramount that digital readers learn to s*et clear and stimulating reading purposes* (Coiro, 2015). In my opinion, it is much more important for readers to define these *intentions* for themselves than to depend on those casually found and established by others in digital texts. *Intentions* established by the readers themselves are the most effective, governing their attention and thought, and therefore their reading activity. It is also imperative that readers learn meaning making strategies that are needed to achieve their goals and generate knowledge, that is, learn how to select the relevant available pages (or sections) to read, how to select relevant information, and relate the selected information into a coherent whole, and actively integrate it what they previously knew in order to build new knowledge, and revise and evaluate their achievements in light of their purposes

(Coiro, 2015; Jewitt, 2008; Kress, 2010; Naumann & Salmerón, 2016). Therefore, digital text readers crucially need to develop the ability of self-determination, this is, to learn how to (consciously) plan their digital reading, to stick to it throughout the construction of their reading path, monitoring the process and the knowledge they thereby construct. It seems to me also important to note the results, shown by recent research carried out by Naumann & Salmerón (2016), which shows the interplay between such online and other print-based comprehension processes. Their studies begin to reveal how the the performance of a self-regulated digital reader might be related to the reading ability that is independently developed offline, by learning to read texts in paper. By researching the connection between decisions concerning online page selection and task completion, their results show that

> relevant page selection on online comprehension is enhanced by offline comprehension skills, since without those appropriate skills, students displaying whatever navigation behaviour will not be able to completely understand a digital text (…). "They do also reveal that good offline comprehension skills are not sufficient in themselves to produce good digital reading performance. Rather, if students fail to comply with demands of relevant page selection, the otherwise strong and positive association of offline comprehension skill and digital reading performance is no longer significant (Naumann & Salmerón, 2016: 51-52).

On the whole, the requirements posed by digital texts that have been discussed here point towards the activation of reading processes which allow readers to "impose"

themselves upon the chaos of alluring and overflowing information and bring out of it the coherence that best suits their interests. As Kress puts it, such meaning-making capacity comprises a "disposition towards 'architecture' and 'building' rather than one of mere navigation and selection among given options" (idem: 197). Contrariwise to what would appear to be, such a disposition does not embody a restriction to the freedom and power allowed by the digital text, instead representing *a condition for the achievement of that freedom and power of the reader* (cf. Kress, 2010).

Concluding remarks: envisaging reading research in the early years

On account of multimodality, interconnectivity and interactivity of digital texts, agency comes up as one of the major attributes (if not the main) of digital readers (Kress, 2010; Jewitt, 2008). Although being much discussed as far as paper reading is concerned (Eco, 1987), readers' *agency* gains a new breath in digital reading contexts (cf. Bezemer & Kress, 2016; Kress, 2010). Actually, both the possibilities granted and the meaning-making demands posed by digital texts make digital reading (in particular the one done to build knowledge and learn) a complex task, which includes integrated understanding of multimodality, understanding of the multiple texts that interface with the original digital text, critical and deep questioning of these texts, careful planning of the meaning-

making process, clear definition of objectives and strategies, monitoring the implementation of the plan. In this context, the proficient digital reader is the user of different conventions with potential for meaning, a questioner, and an autonomous meaning-maker. He is, to that extent, an *agentive reader*.

In my opinion, agency is a particularly interesting open door to the studies, which, under the DigiLitEY project, aim to know and theorize about the practices of onscreen reading of zero to eight-year-old children (Sefton-Green, Marsh, Erstad & Flewitt, 2016). I believe this is due to three reasons. First, these children have a powerful social experience of digital reading before school, in which they actually make meanings from the information that is displayed on screen, under which they do certainly set the basis for their own agency, in the same way that they can build other knowledge and social interaction skills. Second, if these children learn at school the needed agency to 'read on paper', they can also learn at school the required agency to read on screens, creating a possible symbiosis between both learnings. Third, from the moment they build this learning at school, these children can enhance and transform their personal agency in their digital reading experiences outside of school.

I believe that undertaking research on the agency of zero-to-eight-year-old digital readers, their characteristics and development, is one of the main challenges

under the DigiLitEY project. Taking into account the discussion of this text, it seems possible to assume that such challenge may be faced by finding the answers to the following research questions (and sub-questions):

- What is digital readers' agency like before coming to school?

Which digital reading practices do children do before coming to school? Which texts do they read? Which kinds of meanings do they make (what do they learn)? Which meaning-making processes do they activate to make meaning? Which are the most striking features of digital texts that children make use of in their meaning-making processes? What do they learn about digital reading in their attempts to build meaning from digital texts?

- What is digital readers' agency like throughout the early years of schooling?

Which pedagogical principles undergird the teaching and learning of the agentive digital reader at school? Which specific processes do they explicitly learn as regards digital reading at school? How is learning of digital reading articulated with learning of paper-based reading? How do students apply their learning about print and digital reading in school practices? Which digital reading practices do children make at school? What kind of digital texts do they read? Which kinds of meanings do they make? Which

meaning-making processes do they activate to make meaning? Which are the most striking features of digital texts that children make use of in their meaning-making processes? Which are the most difficult characteristics of digital texts for them?

- What is those readers' agency like out of school?

Which practices of digital reading are informally done by school children out of school? Which texts do they read? What do they learn from such reading? Which meaning-making processes do they activate to make such meanings? Which are the most striking features of digital texts in their meaning-making process? How is out-of-school reading articulated with its learning at school?

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Contextualising digital practices at home – Whose *contexts*? Whose *homes*?

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Abstract

This paper reviews background factors of the research questions that guide this network. From the White Paper I move on to other methodological contributions emerging from recent international literature.

Key words: Research methods; Research questions; Families; Parental Mediation;

Introduction

The I would like to start my notes for this round table focused on digital practices in homes and communities by sharing with you the words of a mother about her 4-years-old daughter's media uses after arriving from school:

> ... because she's been doing things all day at school and she's been learning and everything, I think it's her downtime, it´s what she sees as her downtime. You know when she's been hard at work at school all day, as she sees, it's her relaxing time. When she's got her uniform off and she's got changed into her normal clothes and she´ll sit back on the settee and she'll have CBeebies on she'll play on the tablet to half an hour before she has her tea. (Jade's Mum)

The quotation above was taken from the final report of the project Technology and Play, led by Jackie Marsh (2015) in the UK. This comprehensive research analyses the digital experiences and contexts of British pre-schoolers (0-5 years old) through four phases: an online survey of parents and caregivers; in-depth case studies of preschool children's use of tablet apps in six families; observations of and interviews with children using apps in a school environment; and an analysis of these apps in order to identify promotion of play and creativity. The project thus constitutes a remarkable background for the current COST Action. The demographic profile of Jade presents her as a white girl, from the social class labelled as D and without siblings (Marsh et al., 2015, p. 4). She was one of the six children from different

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backgrounds who were visited at home.

Jade's mother describes her media use after school in contrast with the structured learning activities that the child faces at school, reporting a regulated 'downtime' scheduled by the clock. References to the school uniform or to 'having tea' activate in my mind a sense of 'Britishness' expressed by a white working class mother. In Portugal such references tend to be associated with upper class households, with resources for affording private schools where children use uniforms. Informed by this cross-cultural impression, I organised my notes with a focus on the background factors of the research questions that guide this network. From the White Paper I move on to other methodological contributions emerging from recent international literature.

DigiLItEY research questions: contextualising digital practices and literacies

The White Paper for COST Action IS1410, co-authored by Julian Sefton-Green, Jackie Marsh, Ola Erstad and Rosie Flewit, recalls the two research questions of the Action:

1) What does it mean growing up immersed in and surrounded by digital devices and forms of communication - for the everyday life, for learning, for families and for the future?

2) In what ways are the literacies of young children being transformed by wider social, technological and economic changes across Europe?

As the authors note, while the first question

is oriented to social implications of growing up in digital times, surrounded by devices and forms of communication that did not exist in the childhood times of previous generations, the second question places technological changes among other changes that affect children's development of literacies. Thus, both research questions contextualise the digital environment instead of isolating it as an object of study: "digital technology does not determine social relationships: in reality it is the other way round" (p. 3).

In the following pages of the White Paper, four points provide food for thought on these social relationships: *1) Families, employment and housing; 2) Digital transformations; 3) Changing childhoods: consumption, risk and play; 4) The growth of the 'schooled society' and changing literacies.* Let us briefly review these four points.

Current *families* are living under conditions that differ from the modern family representations or the welfare policies consolidated in the 20 century in many European countries. Changes in the "family time" are related with factors such as the growth in female employment, the impact of globalisation on national economies and the work organisation, the scarcity of affordable housing for many couples, the increasing growth of large metropolitan areas or the rise of ethnic diversity in several countries.

Changes in the family time are also related to changes in the domestic space and its devices, such as the crescent number of

screens. Among the digital transformations accessible to younger children are the role of tablets as devices for watching TV programs or video clips, playing games and using apps. The White Paper notes the lack of knowledge on issues such as: non-commercial driven digital activities; the extent and range of the digital usage in these ages in terms of developing literacies; children's understanding of the world and of social relationships; the implications of these practices for children's education as a whole.

On the changing childhoods in terms of consumption, risk and play, the White Paper points to factors such as: the growing commercialisation of childhood and the child-related marketing in relation to products crossing media platforms and shops; the renovation of media panics aside with the rhetoric of the media opportunities for self-expression and creativity. As the authors note on these creative activities, "very little is known about their day-to-day occurrence, particularly for the youngest age group" (p. 10).

In relation to the growth of the 'schooled society' and the related 'pedagogicisation of everyday life' – expressions coined by Basil Bernstein and other authors in the first decade of the 21 century – the White Book shows its connection to factors such as the decline in the rates of middle-class employment, the competitive value of forms of assessment and accreditation, or the challenges faced by the public school system. Effects of these pressures on children are the 'curricularisation of leisure",

an expression coined by Buckingham and Scanlon (2002), as part of a move towards a standardisation of early assessment.

Therefore, it is not a surprise that 'schooled' societies are marked by an exploration of educational products. The beliefs that out-of-school educational media are important to prepare their young children for school success have helped to fuel the explosion of these educational products, particularly among middle and upper class parents. In the United States, an analysis of Apple Store contents revealed that nearly 80% of the top-selling apps in the education category targeted children, with the "general early learning" category being the most popular subject (Shuler, 2012). However, and as pointed above, while these apps are presented as educational, there has been a lack of published research evaluating whether children do learn from these app game experiences (Wartella and Lauricella, 2014). The current COST network aims precisely to contribute to this knowledge.

Recalling these broad frames introduced in the White Paper of the current COST Action certainly makes us more attentive to the diversity of parents' social positions and expectations in relation to their children's digital uses, which are frequently expressed in contradictory views. For the purpose of our research, instead of considering 'parents' as if they constitute a homogenous group, it seems more productive to consider the diversity of contexts they experience and the dynamics of parental mediation practices. My next

notes go to recent literature that stresses these points.

Questioning the focus on WEIRD families and conditions for transcendent parenting

Celebrating its 10th birthday in January 2016, the special issue of the *Journal of Children and Media* contains a large number of articles discussing the challenges experienced by children in contemporary digital times and possible paths for future research considering their rights. I selected two articles from researchers outside Europe, which are particularly rich in methodological suggestions for overcoming ethnocentric views.

Researching children, intersectionality, and diversity in the digital age, by Meryl Alper Vikki Katz and Lynn Schofield Clark (2016), from the US, focuses on methodological challenges in order to cover the multiple contexts in which children grow up. As the authors call our attention, not only research on children and adolescents' experiences with media and technology has largely echoed the concerns of the middle-class and majority cultures. Also the focus on the so-called WEIRD families – a label for those Western, Educated, Industrialized, Rich and Democratic families – has been aligned with the trend to catalogue the disadvantages faced by particular social groups at the expense of considering their strengths.

Alper and colleagues underline that, in recent years, children and media scholars have increasingly challenged both the essentialist categories and the deficit frameworks pointed above, in favour of examining the social and cultural conditions by which young people are differentiated. The authors identify two orientations that have been particularly useful for this purpose: 1) explorations of the intersections between social identities through a feminist approach that affirms the relative advantages and disadvantages of different social positions; 2) taking assert– rather than deficit-based approaches – by identifying the abilities, agencies and aspirations individuals draw on in order to address life challenges and opportunities (Alper et al., 2016: 109). This is certainly a stimulating perspective for the purpose of understanding multimodal practices of young children in their use of screens and the conditions in which they achieve their multi literacies. In fact, and as pointed out in the White Paper, children's practices cannot be isolated from the diversity of their social time, space and life conditions.

Through the tablet glass: transcendent parenting in an era of mobile media and cloud computing, by Sun Sun Lim (2016), is the second article I would like to share. The author lives in Singapore, one of the urban societies most deeply penetrated by the digital, and the article makes us reflect on the current conditions of parenting. The article explores how mobile media and cloud computing shape the communication practices and media consumption habits of families, influencing how parents guide children's media use, and how parents and

children connect with one another. This growing prevalence of mobile media and cloud computing has different implications in each stage of young people's development, from the first years of life – the focus of our attention – to young adulthood. Lim argue that the advent of pervasive, ubiquitous media has engendered the practice of 'transcendent parenting' which goes beyond traditional, physical concepts of parenting, to incorporate virtual and online parenting and how these all intersect. This perspective is also in line with the attention to the impact of digital transformations on young children's life, the changing childhoods and literacies, highlighted by the White Paper.

Concluding on the need of research identifying the possible adverse effects of this new forms of parenting on families and its implications for children's development, Lim adds a set of research questions taking into account the social diversity of the families.

These questions are also in line with the refusal of a digital determinism over social relationships, expressed in the White Paper and also reported above: How do parents of different socio-economic profiles cope with the demands of transcendent parenting? Do higher SES parents have more intellectual and financial wherewithal to adopt tools and strategies that can help ease the transcendent parenting burden? Or are they conversely more oppressed by the overwhelming amount of knowledge about the normative standards they must strive to meet as "responsible parents"? Do

lower SES parents feel defeated by the time and effort required to guide their children's mobile media use? (Lim, 2016: 27).

For a productive research program on these demanding questions, Lim (2016, pp. 27-28) suggests orientations that may inspire our networking: 1) innovative research protocols that can make sense of the mobile multi-screen, multi-app, multimedia and multimodal environment that surrounds family today; 2) the review of current parental mediation frameworks that were originated in a much less complex era; 3) the adoption of an approach that captures the high level of connectivity and persistent media consumption environment that families and children increasingly inhabit; 4) the combination of attention to media content and to media consumption - research should explore how contents and contexts interact, delving into the typical settings in which children consume *different kinds of media content, on which devices and in whose presence they do so*, and the online and offline interactions surrounding such media use.

I would like to conclude these brief notes by calling your attention to another recent article, *A qualitative inquiry into the contextualised parental mediation practices of young children's digital use at home*, by Bieke Zaman, Marije Nouwen, Jeroen Vanattenhoven, Evelien de Ferrerre and Jan Van Looy (2016), from Flanders, Belgium. The study was designed in a qualitative and mixed-method approach involving an active interaction with 24 parents of 3-9-years-old children, from different social backgrounds.

The analysis provides rich evidence of dynamics of parental mediation often marked by contradictions and movements from one type of mediation to another: restrictive, active and distant mediation, co-use, and participatory learning.

Restrictive and active mediation, the most identified kinds of mediation by parents themselves, are analysed by taking into account parents' decisions on time, devices, contents, location and purchase. Distant mediation covers those parental attitudes expressing deference and trust in the child's choices, and of supervision, when parents allow children to use digital media with a certain autonomy but under direct supervision. The authors link this kind of mediation to parents' multitasking housekeeping activities in line with the White Paper's call for attention to the contemporary contexts of family, employment and housing. Co-use mediation distinguishes two parental attitudes and practices: the helper and the buddy, the latter sharing media activities for family pleasure and recreational purposes.

Participatory learning, a form of interactive mediation between parents and children favoured by the digital environment (Clark, 2011), was here visible in parents' words and observed parent-child practices in ways that illustrated the pressure of the 'schooled society' reported above. This mediation identified by Zaman and colleagues combined characteristics of co-use and active mediation and was manifested among parents who wanted to invest in their children and/or their own knowledge and skills; the expression of this mediation emerged in parents' words directed to operational learning; the latter was seen as an investment in acquiring digital literacy skills for both the child and the parent.

As the authors conclude, the study revealed the dynamic and often paradoxical nature of parental mediation, not only providing examples of emergent practices of parental mediation but also making visible the need of a holistic approach and the importance of accounting for contextual and social practices as part of a research program.

Similar ideas have also been expressed in other recent forums, namely the platform "Parenting for Digital Future", led by Sonia Livingstone and Alicia Blum-Ross. Here one can found accessible research notes by academics and activists around the world, several of them focused on questions related to our age group. Among the many references, I would like to underline the post by Livingstone and Blum-Ross, questioning and discussing the generic advices to parents on screen time[2].

These brief notes moved from my impressions of 'Britishness' in the words of a working class mother crossed with my own national context to a brief review of recent papers on environments and methodologies. I hope that their evaluation of diversity and intersectionality of factors

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[2] See http://blogs.lse.ac.uk/parenting4digitalfuture/2016/07/06/what-and-how-should-parents-be-advised-about-screen-time/ (accessed on 24.08.2016).

may be useful for research on the younger digital users with which we are involved as a network.

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Afterword

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The COST Action DigiLitEY was established in 2015 in order to further research on young children's digital literacy and multimodal practices. Such an initiative was urgently needed, as the landscape of contemporary childhoods is changing at a pace previously unknown due to technological developments. One of the key aims of the COST Action was to bring together emergent research in this area, given that little was known about the kinds of related projects that were being undertaken across Europe. This book clearly addresses that aim, as it provides a rich snapshot of European children's digital literacy lives in homes and schools, based on a series of innovative research projects.

In my own contribution to the Training School, I contended that, based on research I have conducted in this area over many years (see, for example, two studies that were conducted ten years apart in this area, Marsh et al., 2015; 2016), there are a number of key characteristics of young children's digital literacy practices in the home. These characteristics are outlined in Figure 1 (below).

This list of characteristics is not exhaustive, nor is it the case that all characteristics are present simultaneously in each digital literacy practice, but any practice may embed one or more of the characteristics. In the papers shared in this e-book, we can see numerous examples of these characteristics of digital literacy, and each study offers rich insights into how they inform children's digital worlds. In addition, it is vitally important that early years settings embed these characteristics into their approaches to digital literacy learning and teaching, if curricula and pedagogy are going to be appropriate for children's needs. The papers in this e-book that are based on studies conducted in early years settings and schools demonstrate strongly that when the characteristics of digital literacy practices in homes, outlined in Figure 1, are rooted in formal approaches to learning and teaching, then children become engaged and motivated learners.

DigiLitEY's first Training School was important, therefore, in demonstrating the vitality of young children's digital literacy practices in homes, communities and early years settings and in identifying the ways in which policy makers should be responding to these developments. In addition, the Training School offered a vital opportunity for Early Career Investigators, whose pioneering work in the area is moving the

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Figure 1: Key characteristics of young children's digital literacy practices in the home
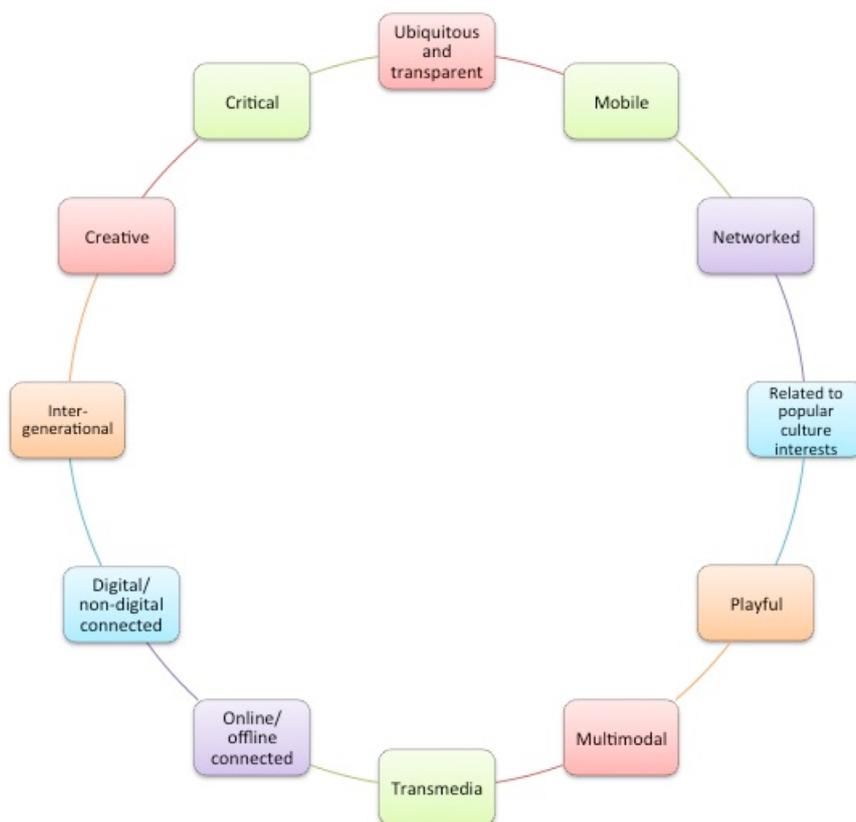
field forward in a variety of exciting ways, to meet together and form networks that will surely be enduring for them in the years ahead. I was deeply impressed by the work undertaken by the presenters throughout the Training School and came away highly optimistic for future research in this area. Already, as you can see from the papers in this e-book, these PhD students and Early Career Investigators are offering a range of original and significant findings that expand our knowledge of young children's digital literacy and multimodal practices. The field is attracting very talented and reflective researchers whose work is going to shape our understanding of this area further in the years ahead.

The presentations throughout the Training School demonstrated a diversity in methodological approaches, appropriate for projects that involve very young children, which are undertaken in a range of formal and informal contexts. The Training School's focus was not on methodologies, but instead this will be the emphasis of the Action's second Training School, to be held in the summer of 2017. The COST Action congratulates Dr Íris Susana Pires Pereira, Dr Altina Ramos and their team on organising such a successful Training School, which provided such rich learning experiences for all involved. We look forward to the next Training School, and are confident that it will build very well on the strong outcomes of the first event that took place in Portugal in the summer of 2016.

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