

iPad and computer devices in preschool: A tool for literacy development among teachers and children in preschool

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Abstract

The title of this thesis is “iPad and Computer devices in Preschool: A tool for literacy development among teachers and children in preschool.” The study was an exploration of how teachers and their pupils put iPad and other computer devices into use in early childhood education. This study was a qualitative research study, based on the observation of the pupils and the interviews of the teachers. In this study, observation of the children and interviewing of the teachers over a period of five weeks produced significant results. The children participants in the observation were approximately 60 and they were between the ages of 3 to 6,5 years. Four preschool teachers and one preschool teaching assistant were interviewed in an attempt to substantiate the use of ICT in early childhood education. The overall result of the study was that the teachers’ positive attitude towards iPad helped to enhance and facilitate the development of literacy skills in the children. This study provided evidence of how children created their own learning environment by actively practising their reading, writing, and comprehension skills. It also showed how ICT enhanced social interaction and developed intra-action activities among the children, to a situation that eventually led to the development in their learning.

Keywords

ICT, early childhood education, multimedia, iPad, computers, tablet computer

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Background

Introduction

The use of Information and Communication Technology (ICT) is increasingly recognized as an integral learning tool for promoting the social, linguistic, cognitive and literacy development of young children. The trend of today is not a question of the risk of ICT in the schools rather it is a question of how it is being used in a more lucrative way.

The Swedish national preschool curriculum has paid more attention to the use of ICT in early childhood education. The curriculum stated that literacy “involves building, designing, and using various materials and technologies. Multimedia and information technology can be used in the preschool, both in the development and application of creative processes” (Lpfö98, 2011, p. 6-7). The UNESCO’s *Information and Communication Technology in Education: A curriculum for schools and programme of Teacher Development* stated, “... Given the right software, students can compare their own pronunciations with those of a synthesized model, both orally and visually” (UNESCO, 2002, p.86). There are innovations in information and communication technology world. Information and Communication Technology (ICT) offers the opportunity to inquiry and inquest. There are wide range of ICT use in some preschools and kindergarten around the world, such as TV, interactive smart board, e-books, interactive toys, audio book, tablet computers etc. These have had a role in the educational development in the preschools and schools in general. Children naturally explore and learn about their immediate environment through inquiry (Wang, Kinzie, McGuire & Pan, 2009).

This study, nonetheless, focused on iPad and computer devices as one the aspects of information and communication technology (ICT). This was because the preschools that were used as case study were using tablet computers like iPad and other computer devices in their preschool. iPad is a portable tablet computer launched 2010 (www.apple.com/ipad and wikipedia.org/wiki/iPad). iPad is also a new tool in the preschools and in schools generally. The tablet computers (iPad) were everyday utility in these preschools. However, in the subsequent chapters, tablet computer will be interchangeably called iPad likewise Information and Communications Technology would be used interchangeably as ICT.

Purpose and Research Questions

The purpose of this research study is to explore the ways the preschool teachers and the preschool children use Information and Communication Technology (ICT) at preschool in relation to literacy.

Research questions

The study discusses the following questions:

- How do the teachers describe the use of information and communication technology, especially the use of iPad and other computer devices, in preschool in general and in relation to literacy?
- How do the preschool children use iPad and other information and communication technology devices in relation to reading and writing?
- How do the use of iPad and other ICT devices promote social interaction among the children?

Literature Review

Conceptualisation of literacy in relation to Information and Communication Technology (ICT)

Literacy has been conceptualised in different ways over the years. The definition of literacy has been a discourse in the paradigm of education. UNESCO's global monitoring report in 2006 (published 2005), review the different meaning of literacy in different languages and by researchers. Literacy has been related to human 'learning' and having "ability to read and write" (UNESCO, 2005). It will be of importance to view the different concepts of literacy in order to define the word 'literacy' in relation to this study. UNESCO highlighted the four different definitions of literacy, which came into account after 'evolving debates': "literacy as an autonomous set of skills; literacy as applied, practised and situated; literacy as a learning process; and literacy as text" (UNESCO, 2005, p. 148). The evolving debates, according to UNESCO, include critiques and different approaches to the concept of literacy. From the above definitions of literacy from the international perspective, it shows that literacy deals with interaction and construction of reading process where a learner or an individual is an 'agent of meaning making' (Dahlberg & Moss, 2005).

Organisation for Economic Co-Operation and Development (OECD), according to Kennedy, Dunphy, Dwyer, Hayes, McPhillips, Marsh, O'Connor & Shiel (2012) defines literacy as understanding, using, and reflecting on written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society. The Progress in International Reading Literacy Study (PIRLS) which was conducted with fourth grade students defined literacy as the

"ability to understand and use those written language forms required by society and/or valued by the individual. Young readers can construct meaning from a variety of texts. They read to learn, to participate in communities of readers in school and in everyday life, and for enjoyment" (Kennedy et al, 2012, p.38-39).

Everett (2006) doctorate thesis *Multiliteracies in early childhood education* concerns the modes and media of communication by first grade students stated that "literacy is not a single, autonomous process; rather, literacy is an array of multiple, complex processes" (p.16). The author referred to Street (1999, 2000) who defined literacy multi-complex processes as an incorporation of literacy events into literacy practices. Literacy event "constituted an occasion when two or more participants engaged in print/language activities for a certain purpose and which culminated in closure and feedback to the participants" (Fagan, 2003, p. 86), whereas, Literacy practices are the "acts of literacy which are always embedded in social practices of communication, in which members of a community seek to construct particular identities, relationships, or valued activities and objects" (Myer, 2006, p. 62). Regarding multimodal communication, Kress (2010) mentioned that multimodal communication is a medium of communicative practice, which involves different representations of interaction. Therefore, the medium of technology can also be seen as the material for understanding the concept of

literacy (more elaboration in the literature review). Literacy concisely can be seen as the representation of symbols, signs, print, and images that the media (*media* here means the digital tools) use to decode or encode symbols and signs rather than just for skill building and creativity. Kress and Leeuwen (2001) explain that “communicative practices always involve both representation and interaction. First of all, by communicating we interact, we do something to, or for, or with people... None of the communicative activities can exist without being linked to ... other modes...” (p.114). However, in the discourse of social semiotic perspective, knowledge representation is transmitted in the social context and exchanged in the contexts of meaning making from activities and other agencies. Another aspect of literacy research which Kress (2010) brought up in the context of literacy multimodal communication, which acknowledges ideologies, and complexities of contexts is the social semiotics perspective. The social semiotic perspective as described by Kress is a theory which deals with “meaning and meaning making; with sign-making and signs. ‘Making’ implies a ‘maker’ hence agency is central” (Kress, 2010, p. 107).

There is need for an understanding of literacy and the discourses surrounding literacy to create a ground for the understanding and usage of information and communication technology in early childhood education. Kress (2010) and Kress & Leeuwen (2001) expanded on the notion and discourses of literacy and communication within a post modernistic perspective to understand the role and the need of Information and Communication Technology in early childhood education. Everett (2006) referred to the contribution of Kellner & Durham (2001) to the notion of literacy in the postmodern perspective: “postmodern pedagogy contributes to the exploration of the multiple ways that literacy can be learned, expressed, and evaluated. Learning in a pedagogical context framed by questions of what counts as literacy, how it is expressed, and how it is learned is particularly necessary in the age of multimedia and multimodal communications” (p.7). In other words, post-modern literacy involvement extends beyond traditional reading and writing. It involves all forms of communications: print, signs, symbols, CDs, video, computers, iPads and ‘soft’ material and different skills needed in knowledge development which evolves in the use of ICT. In the below diagram, there is a summary of how different skills and concepts evolve round the information and communication technology capability.

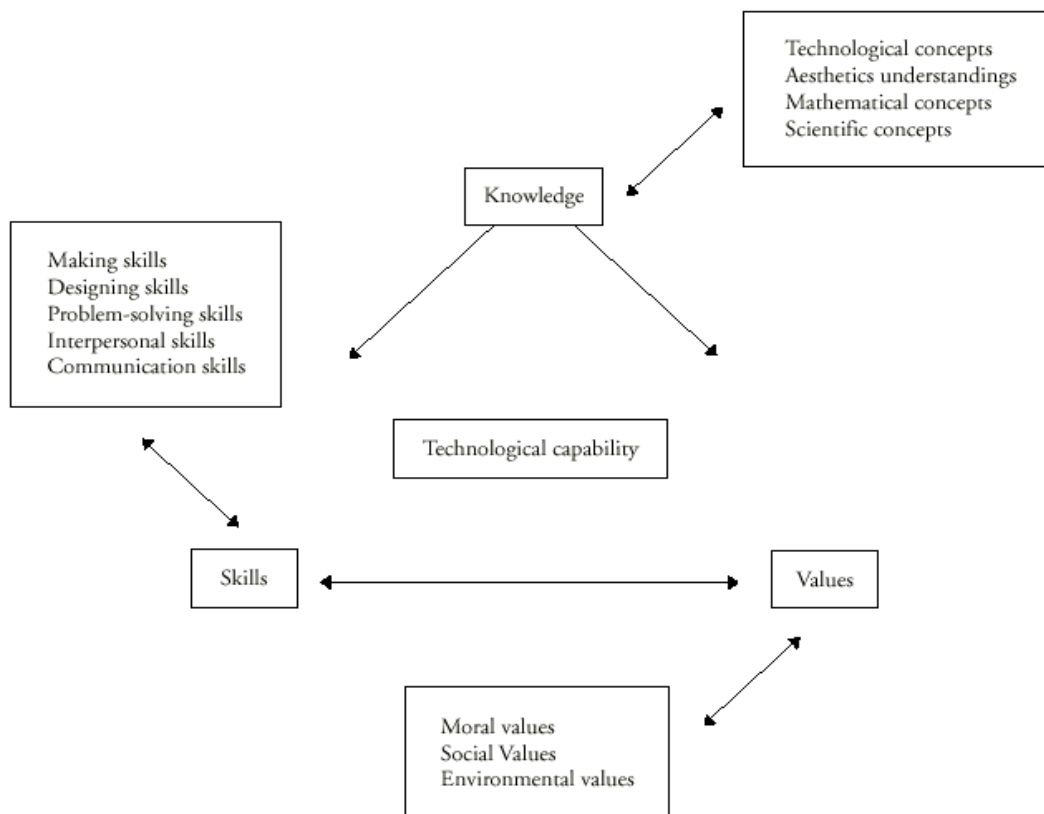


Figure 1. The interrelationship between skills, knowledge, and values in technological capability. (Diagram adapted from Shield, 2000, p.72)

ICT is seen as a useful medium with which values, knowledge and skills can be delivered in a society towards sustainable educational development. The figure above presents the interrelationship between skills, knowledge, and value creation through technology. It also explores and reveals the different aspect in which technology capability can be projected to enhance different forms of skills, knowledge, and values.

Role of ICT in literacy development

Cook and Finlayson (1999) highlighted the Tharpe's (1993) seven strategies, which can be used by the teachers in assisting children's performance in the classroom. These strategies mentioned can be seen as roles and benefits of ICT in the development of children's learning. Tharpe (1993) stated the following strategies: Modelling, Feedback, Contingency Management, Instructing, Questioning, Cognitive structuring, and Task structuring. (See Table 1).

Strategy	Teacher	Computer software	Peer group
<i>Modelling</i>	Through whole-class demonstrations of software, offers a model of the process	Can take a pupil step by step through a procedure	Children often model for each other particular techniques or move in problem-solving tasks

<i>Feedback</i>	Indicates to pupils the acceptability of their problem-solving approach and procedural steps	Offers information to the learner which allows for self-correction	Children guide the thinking of others by their comments, suggestions, connections
<i>Contingency management</i>	Celebrates success as part of pupil reporting phase to encourage a desired behaviour in others	Success with tasks or the application of specific tasks or problems solved is highly motivating	Peer pressure influences the behaviour of group members
<i>Instructing</i>	Part of the teacher's introduction and task setting	Often, programs re-offer problems in a different way or request learners to carry out specific activities	Children direct others as a result of their own experiences
<i>Questioning</i>	Requires from the learner a verbal response which comes about as a result of more sophisticated thinking	Programs contain specific problems which must be solved before moving on to the next phase	Pupils challenge each other by their questions about actions, techniques or world knowledge
<i>Cognitive structuring</i>	Part of the teacher's task-setting decision making, making goals clear, explaining procedures	Provides clues, offer suggestions, uses formats known to the pupils	Peer tutoring activities, when one pupil gives hints to others
<i>Task structuring</i>	Helping learners to work through component parts of the task so that they are actively working in the ZPD	Breaking down a task into component parts and re-presenting these as a series of manageable steps	Help with suggestions about actions drawn from their own experiences

*ZPD means Zone of Proximal Development

Table 1: Adapted from Cook & Finlayson (1999, p. 99-100)

Cook and Finlayson (1999) highlighted Cox (1997) comment on the children's use of the computer devices that "children find computer activities highly motivating and work very hard to achieve improved performance and better effects" (p.51). Shilling's (1997) study also shows that even in play, ICT contributes to the cognitive development of the children.

There were two pilot studies designed to consider the efficacy of multimedia programmes for the training of reading and spelling by Daal and Reitsma (2000). In the first study, the authors found out that independent computer practice accelerated learning in 5-year olds. The second study suggested that the use of the computer engages the children more in reading. However, Macaruso and Rodman (2011) also did two pilot studies in the use of the Computer Assisted Instruction (CAI) program. These pilot studies indicated that the children who participated in the computer-based reading and spelling practice were able to read better than the children who did not have access to computer-based practice. The two studies showed that the children learn to read faster and the children's phonetic skills developed by using the computer assisted instruction program. Couse and Chen (2010) studied the viability of the stylus tablet computer as a learning tool in early childhood education setting. One of the outcomes of the research was that "tablet computer technology allows a unique opportunity for

children to be in control of their thinking and learning in a way that is more closely aligned with traditional paper and pencil media...” (Couse and Chen, 2010, p. 80).

Mobile learning

The attitudes towards technological advancements as a prospect for schools have changed. Rosen, Carrier, and Cheever (2010) stated that it is no news anymore about the use of technology in the school and he sees that as a new avenue or a new link in the educational model of teaching. Rosen, Carrier, and Cheever went further to explain that the use of computer devices today is in fact what can be referred to as “Mobile learning” (p.59). “Mobile learning or mLearning” compared to traditional classroom learning settings makes it possible with online distance learning and electronic classroom setting. The authors clarified that mLearning may make learning more attractive and interesting. “Electronic classroom tools...made education more interesting and allowed for opportunities to present content in new and different ways, but they were still tied to static material presented in a static learning environment” (p.59). Rosen, Carrier and Cheever presented an argument that there is nothing so special about mobile learning that requires special technologies in the schools because the children and adults now have the technology at their disposal on daily basis. They said that the cost of the mobile technologies like iPhone and other smartphones with Internet access contributed to the development of electronic learning. Rosen, Carrier and Cheever also pointed out the future and the positive influence of the communication technology in the school. They highlighted that the concern of the “educators have also expressed concern about how easy it will be for their students to type on the wireless device.... With mLearning, we are moving toward a paperless school” (Rosen, Carrier, & Cheever, 2010, p.60,61).

Barton and Collura (2003), according to Couse and Chen expressed that tablet computers “have advantages for improving the writing and organizational skills of high school students, because they are able to either type or handwrite stories, and handwritten notes can also easily be converted to typed text” (Couse and Chen, 2010, p.78). Couse and Chen highlighted National Educational Technology Standards’ (ISTE, 2007) examination, which “reveals that stylus-interfaced technology (*a tablet computer*) holds potential as a learning tool and as a means to implement technology standards in early education. The relevant standards include: Creativity and Innovation, Communication and Collaboration, Critical Thinking, Problem-Solving and Decision-Making, as well as Technology Operations and Concepts” (Couse and Chen, 2010, p. 78,80). UNESCO conducted research in 2010 and the outcome of the research reveals that “the environment of primary education supports innovation and transition to modern, playful and exploratory learning remarkably well. One of the reasons is that, for each class, most subjects are usually taught by the same teacher. This creates opportunities for complex integration of ICT across subjects and facilitates the emergence of new pedagogies” (UNESCO 2011, p. 2).

Theoretical Framework

There are broad ranges of theoretical perspectives on young children's early literacy development and Information and Communication Technology (ICT). This includes at least three paradigms – behaviourist, constructivist/cognitive and socio-cultural perspectives. Besides these three paradigms, the postmodernism paradigm in correlation with the concept of intra action of the children with a non-human material that facilitates learning will be reviewed.

Behaviourist theory

Behaviourist theory in education referred to or designed for reinforcement and this can be seen in today's computer software, for instance iPad applications (*apps* as it is being called) and other computer devices. Skinner (1958) referred to "Pressey's Teaching Machines" by explaining and analyses Pressey's understanding of technology in teaching. It may be suggested that it is possible to see certain technological tools as teaching machines, which helps and encourages the children to take an active role in learning. In 1920s, according to Skinner (1958), Pressey designed different machines for automatic testing intelligence and information in which the children were tested with multiple-choice questions. Shield (2000) discussed the behaviouristic perspective as a type of learning where instructions and feedback control the practice. Shield went further to suggest that in game play, with for instance computers, the learner is rewarded through encouragement and the moving to the next level and by so doing making the learning behaviour of the children to be progressively rewarded as each level of the game is mastered.

"It is in this type of learning that the use of ICT is immediately apparent. The computer games that are so highly addictive to teenagers are perfect examples of learning behaviour being progressively rewarded as each level of the game is mastered. This learning is not restricted to the cognitive field in which the game is mastered but also in the area of psychomotor skills when the reflexes of learners are constantly refined to produce ever faster reactions to visual stimuli." (Shield, 2000, p.74)

Constructivism/Cognitive perspective

According to Shield (2000), constructivist theorists are scholars aiming at understanding how a learner, within a certain context, obtains knowledge. Piaget was one of the theorists described as a constructivist, and he was interested in the children cognitive development. Constructivism, according to Lundkvist (2005), is the principle in which learning encompasses an individual constructing its knowledge out of his own experience and the knowledge cannot be seen tantamount to the empirical sensory impression. Lundkvist (2005) referred to Stensmo's (1944) statement that knowledge is a mental tool to understand reality and consists in interaction between the sensory impression and reasoning. One of the main ideas of Piaget is that knowledge construction is based on what is learned (Lundkvist, 2005, p.24) in which Piaget focuses more on the mental development for meaningful learning. From the cognitive perspective, according to Kennedy et al (2012), there is an acceptance

that “phonological awareness is a critical aspect of early literacy development” (p.1). The authors explained further that the cognitive perspective also lays emphasis on the literacy. The authors also referred to metacognitive which deals with processes “in reading, writing and spelling while cognitive apprenticeship models have led to the emphasis that is placed on children developing problem-solving skills in literacy-related activity through the assistance of a more knowledgeable other” (ibid 12). From the Piaget’s perspective of cognition, an individual creates mental creation of knowledge (Imsen 2006).

Socio-cultural approach

Vygotsky’s socio-cultural theory, according to Lim (2002), “offers a set of conceptual tools that is applicable to various situations to understand the coupling of cognition and activity... where higher mental function appears twice, or on two planes. First it appears on the social plane and then on the psychological plane. ...It appears between people as an interpsychological category and then within the individual child (learner) as an intrapsychological category” (p. 413). Lim highlighted Vygotsky’s claims that human mental function and actions are facilitated by “tools (or technical tools) and signs (or psychological tools)”. Lim also referred to Cole’s (1995) explanation that Vygotsky’s social cultural theory focuses more on an individual learner’s relationship with the medium of which a task is perform. In other words, the cognition of the individual learner is not placed in isolation within only that learners mind; rather the emphasis is placed on the individual interaction with the tools and the other people in the learner’s environment. Alexandersson, Linderöth and Lindö (2001) stated that a social cultural perspective on education shows that learning in itself does not constitute any problem because humans cannot avoid learning. The cause for learning is because humans are in an ongoing “social and communicative process” (p.17). The major subject of the Vygotsky theory is the emphasis on the social interaction of humans and cognitive development of human in the social setting.

Constructivism, behaviourism, and Vygotsky’s social cultural perspective are interwoven according to the summary McLaughlin and Oliver’s table, which was adapted by Shield (2000). The Table 2 summarises how the theories have reflected in the use of ICT in the school.

Theory	Behavior	Constructivist	Socio-cultural
Activities	Drill and practice tutorials	LOGO programming Micro worlds	Collaborative learning
Learning Process	Individual instructions and feedback drill and practice	Individual, discovery based generalisable skills	Social scaffolding interactive, reflective

Table 2. Theories and Computer Use of McLaughlin and Oliver, 1998. p.128 (adapted from Shield, 2000)

The concept of intra-action in relation to ICT and children literacy

Hultman (2011) explains that as the nonhuman materials have a connection with the humans thus both the children and the teachers (human matters) need to unconditionally work together in a pedagogical environment. The author highlighted also that different actors are involved in the construction of the world. Hultman explains that it is not only the human factors like culture, language, discourse or human social interaction that are important in the construction of knowledge, rather there are other nonhuman factors that are considered 'dead', and those materials contribute to the continuous shift in education.

"...världen skapas i ständigt pågående och skiftande processer. Men de konstitutiva aktörerna i denna pågående produktion är betydligt fler än vad forskning influerad Inte bara människor, kultur, språk, diskurser, sociala interaktioner, utan också ickemänniskor: djur, ting, maskiner, naturen ses som aktiva i konstruktionen av världen... att inte bara människor, utan också ickemänsklig materialitet, kan betraktas som agentisk" (Hultman 2011, p.9).

In this case, Hultman went further to explain that the 'things' or nonhuman is part of human and none of them exists on its own, rather 'thing' is an extension of human while human is an extension of nonhuman. Both matters serve as instrument to help each other to reach its potential and be functional. However, Palmer (2009), referred to Karen Barad (2008) concerning performative agents and aesthetic. She explains that performative agents go beyond material agency that is active in our subjectivity.

"Karen Barad (2008, p.146) writes that things are not just passive or dead objects but can be understood as *performative agents*, filled with material agency that 'do' something to our subjectivity. In this sense one could say that discursively inscribed material things/artefacts that are part of daily life, ... Even numbers, formulas, words, signs, symbols and equations written on paper or the white board can ... be understood as performative ..." (p. 398)

In the above statement that Palmer referred to, she stated that materiality has been a thing of discourse and part of the human daily life but there are other material so called 'dead' that are also agential in our subjectivity.

Karen Barad (2012) in her interview with Adam Kleinman defined Intra-action as the avenue where one or more agents having effect on each other causing an action. She came up with the ideology of metaphysics of individualism, which she explained that there are different things that are agential and this constitutes the place and time. She went further in the interview to explain the view in the definition of her ethico-onto-epistemology where she explained that an "individual do not pre-exist as such but rather materialise in intra-action" (Barad, 2012, p. 77). That is, according to Barad, intra-action goes beyond objectivity of an individual. Barad highlighted on metaphysics that every matter is an agent and this agency is an enactment and none of them exists on its own and if they do, according to her, it 'exist, within phenomena'.

Research Method

Qualitative method was used in this study. Rubin and Rubin (2005) stated that a qualitative research method is a description of a research from one or more perspectives. Qualitative methods, according to Charoenruk (2012) highlight the possibility for the influence of the researcher.

Choice of method

In order to concretise and understand the use of the iPad and other computer devices like desktop computers, laptops and other tablet computers in preschool, the methods used were interview and participant observation. Only interview might not have provided clear results about the children's use of the computer devices like iPad in the preschool in the ways the teachers claim or say they do. In addition, if only participant observation was chosen, it might have given different results other than the outcome of the combination of methods. Therefore, the combination of the interview and observation as a form of data collection enabled a comprehensive data analysis about the use of iPad and other ICT devices in this study. Rubin and Rubin (2005) stated that the goal of a qualitative interview is to get to the depth of a context and dealing with any overlapping concept or theme.

Using participant observation method means that the researcher is actively involved in the observation process. This enables gathering data about the underlying ideas of the use of iPad and other computer devices in the preschool. According to Stukat (2005), observation is appropriate when one wants to find out what people actually do, not what they claim they do. Therefore, using participant observation gives the researcher the opportunity to understand the surrounding phenomena (DeWalt & DeWalt, 2011). However, there is a challenge of being a participant, the participant observer gets immersed in the process that there might be a possibility of missing out the important part of the observation. DeWalt & DeWalt (2011) state the challenges of participant observation that it might pose a challenge of putting into words or writing what the researcher observed. It would also have been a challenge for me to be a passive observer in the observation process because the children were seeking my attention most of the time.

Denscombe (2007) describes participant observation as a tool that disallows misinterpretation of the observed individual, or situation and establishes an opportunity to become an accepted part of the environment. I am aware of 'the observer effect' due to my activeness; however, the benefit of being an accepted participant observer outweighs the possibilities of subject's behavioural change. The subjects in this case were the children involved in the observation process.

The purpose of using qualitative interview and participant observation is to be able to provide an evidence for the study, explore, and be able to see from the teachers' perspective and the way the children use the devices.

Selection

The selection criteria for the choice of the preschools, the teachers, and the children involved in this study was based on convenience sampling. Gravetter and Forzano (2011) explained that convenience sampling “uses those individuals who are easy to get. People are selected on the basis of their availability and willingness to respond” (p.151). The data selection was purposeful and it involved choosing the interviewees that had substantially learnt from their working experience. Patton (1990) wrote that it is important to select “information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research, thus the term purposive sampling” (p. 169). Two preschools were involved in this study, a county-owned preschool and a private owned preschool. The county-owned preschool will be called Rosa Preschool and the private owned preschool will be called Petal Preschool.

Rosa Preschool

The selection of the Rosa Preschool was based on its geographical location, ownership, and referral. This gave the opportunity to conduct interview and observation. The initial search on a county website was based on the initial recommendation of my supervisor that the county uses iPad and other information and communication technology devices with the children in the preschools. Thereafter, a telephone contact was made to the coordinator of information and communication technology committee of the county preschools. An appointment was booked to visit the preschool that was actively engaged in ICT with the children. Prior to the visit to Rosa preschool, a contact was made to the preschool via telephone and thereafter a visit was paid to the school. A consent letter was sent to the preschool via email to inform and seek the permission of the school and the parents of the children towards carrying out both observation and interview research methods on the concerned people.

The preschool is located in the suburban of Stockholm. Interviews were granted to two of the interviewees based on convenience in a staff office in the preschool and the third educator, in the children learning area, granted an informal interview. Three preschool educators participated in the interview.

Petal Preschool

The selection of Petal Preschool was intentional. The intention was to visit two private preschools that were close to the university. Coincidentally, Petal preschool was chosen based on the location and the involvement of the in ICT. The preschool is located in a new developed area where predominantly academics and children of higher social-economic background reside. The aim of this study was to follow how the preschool use and work with iPad and other ICT devices in relations to reading and writing. The preschool’s profile or pedagogical initiative did not have any influence on my choice of participants. The request to carry out an observation and interview with the teachers was granted by the preschool authority. Thereafter, a consent letter was sent to the preschool to request the permission of the school and the parents to carry out the research.

Two educators were interviewed and approximately 60 children were observed from three departments. It was a bit difficult to separate the groups or departments because of the construction of the physical learning environment. All the children, regardless of the departments or groups use the same learning areas and it created a challenge in distinguishing the children. The preschool children were followed over a period of five weeks on a day-to-day basis.

Participants

Two preschools in Stockholm were involved in this study based on convenience and referral. The total participants were five educators from two preschools and approximately 60 children from a preschool. The preschool educators were between ages 25 to 45 years old and the preschool children age were between ages 3 to 6.5 years old. There were four preschool teachers and one preschool teaching assistant involved. Each of the teachers based on their consent granted the interviews.

All participants, including the children, involved in this study were given pseudonyms to protect their identities. The children involved in my observation came from both working and middle-class economic backgrounds. There was no special educational plan put in place for the use of iPad or any ICT device.

Throughout the study, data were collected in the form of video recording, interviews, took photographs of children's activities and writing samples and drawings and sometimes, during the interviews, notes were taken. Each interview was between 15-30 minutes.

Brief introduction of the interviewees

Linder: Linder is a qualified preschool teacher and she has worked with iPad and other information and communication devices with the children for two years. She works with children ages 1 to 3 years old. She is also a member of the ICT development group in her preschool.

Mary: Mary is a preschool teacher and she works with kindergarten group.

Carol: Is a qualified teacher since 2008 and she has worked for four years in different preschools. Since she has been working in Rosa Preschool, iPad has been a tool for documentation for her. She learnt how to use the device in order to be able to use it effectively at work. However, the use of iPad was what she learnt at work and she believed it is an effective tool for learning.

Eve: Eve is a graduate since 1997 and she got her first degree in early childhood education. She also had different certificates in adventure pedagogic and she believed that iPad or ICT is a good tool to create fun and creativity in early childhood education.

Adam: Adam is a qualified media and graphic developer. He did not have pedagogy degree but he finds the use of iPad a tool for developing children literacy and he would like to continue to use the tool with the children. Adam is being employed as preschool teacher assistant.

Technical equipment used for data collection

Interviews

The individual interviews were recorded with iPhone memo voice recorder in order to document the larger context of the study. As mentioned earlier, an informal interview of approximately 15 minutes in duration was done with one of the teachers in Rosa Preschool and all other interviewees in both Rosa and Petal preschools were granted formal interviews. Interviews with the teachers illuminated broader understanding of the purpose of the use of iPad in preschool.

Semi-structured questions (Merriam, 1998) were developed in advance (See Appendix 2). In the course of the interview, follow up questions were asked based on the response of the interviewees. Interview questions evolved primarily from my purpose of study and from my previous literature review about ICT, "Information and Communication Technology in Preschool: A Literature review

(Oladunjoye, 2013)” and from the observation in the children free play and my personal experience in the teaching profession. The observation serves as a reference point during the interview with the Petal Preschool educator. Some aspect of the interviews that did not concern the purpose of this study was not transcribed. The transcribed aspects of the interview were done in verbatim and they became artefacts to use in the analysis of the study. However, to reduce this concern posed by my position as a researcher in this respect, the teachers were allowed to select their suitable locations for their individual interviews. In Adam and Eve’s case, they were allowed to select the venue of the interview and choose the time that was convenient for them. However, alongside with the observation and the interviews, it was important to for me as a researcher to keep in mind the other researches that had been made before. Nevertheless, literatures and earlier research papers conducted within the field of ICT with early childhood education were studied.

Observation

During the children’s play, the children were photographed and observed. The pictures of the children were taken with an iPhone camera. Similarly, the observations of the children were recorded with a video camera. It was a bit challenging to record, take pictures, and notes of the activities at the same time. As a result, short video recordings and pictures were taken. The reason for the video recording was to capture a real time insight of the process at a later time.

Photographs also offer permanence and the ability to freeze time. Photographs are a useful source of data as they hold an event or activity still for a close look. The photographs were examined to gather specific visual information which hitherto could be missed during the data collection process. The video recordings and photographs provided an opportunity to preserve events that occurred in the pedagogical environment. The notes that were taken during the data collection process were also helpful in the data analysis.

The children and the members of staff of the school were aware of the video recording and picture taking activity. The children were already accustomed themselves to the use of video recorder and digital camera in their daily activities in the preschool. There were times some children made playful gestures toward the digital camera and video recorder. As a result of the research ethics and principles, the identity of the participants were not be published in this thesis. However, few moments of interests were described and analysed in this study.

Procedure

Participant Observation procedure

Reinharz (1998) described observation as another social device that sets a “subtly disparaging and condescending tone” (p. 19) to describe an informal data collection. This author referred to participant observation as a way “in which the investigator immersed himself in a social setting to study it intensively.... Sociologist still use informal research methods when they study the situations about which little is known or situations in which every day behaviour is so familiar that it is likely to be taken granted...”(Reinharz, 1998, p.20). However, in this study, the participant observation was used to supplement and clarify data derived from the interviews. During the observation process, initial reflections, tentative themes, and questions were noted.

During the observation process, the observation of the physical environment and spontaneous discussions were carried out with the educators at Petal preschool. Through a process of continual

refinement, the research questions were reformulated by adding more questions based on what was seen in the observation. The process of the observation included categorisation. Categorisation implies the results of the observation were categorised in themes.

The participant observation took place in the preschool learning area. The preschool have different rooms where the children can flexibly use tablet computers and other computer devices. The observation process took five weeks. Video recording were between 1.35 minutes to 15 minutes both in the morning and between afternoon sections. The data collection was not time restricted, although, being a participant observer and data collector with all the technical tools available was a challenge.

Interview procedure

The interview started with the explanation of the four main requirements of research ethics and principles in humanities and social sciences to the educators. This is to ensure that the participants are aware of the research ethics and the purpose of the research. This is also to assure the interviewees that their identities are protected, likewise the preschools' names remain anonymous.

The interview in Rosa preschool took place in the staff room and during lunchtime. The educators were more relaxed. The third interview with Mary was spontaneous and it took place in the classroom with the children around going about their play. Each of the interviews took approximately 20-30 minutes.

At Petal preschool, interview with Adam took place in the morning in the school and the interview was about approximately 30 minutes. However, the interview with Eve was very short and curtailed because of Eve's tight schedule and this interview was approximately 15 minutes in the staff room.

The selection of the questions was standardised open-ended questions, which are semi-structured and worded. Some of the questions asked were: What kind of ICT material do you use with the children? And, why? In what ways has the iPad been used in the best way in your preschool? Necessary interventions were made during the interview by the explanation of various aspects of the subject in the interview.

The interviews are important part of data collection, so this made the structuring of the interview a challenging genre. Duranti (2001) describes the complexity that involves in interview process. "The complexity of interviews emerges, in part, from the manner in which multiple ideologies and practices intersect in the research process, rendering questions and answers as well as the texts that re-contextualize them heterogeneous and complex" (p. 134). In other words, my position as a researcher might have influenced the way of response of the teachers

Transcription and coding

The relevant aspect of the interviews was transcribed into English language because the interview was conducted in both Swedish and English. No digressions and side discussions were transcribed because of their irrelevance to the research. Halkier (2008) referred to Bloor, et al. (2001) that one should not try to change the word order or otherwise make the spoken language more similar to written language. The transcription was written directly on the computer, and main points were highlighted with different coloured text. The recordings were listened to many times for a better understanding of what was said and the expression in which they were said and referred to. Wibeck (2000) also emphasises the importance of returning to the tape recordings and transcriptions perhaps several times to maintain high quality in the survey. The interview was transcribed in order to get an overview of the collected material and be able to enhance the quality of the analyses.

To facilitate the analysis, the results of the interviews were coded. Rubin & Rubin (2005) defined coding as “systematically labelling concepts, themes, events, and tropical markers so that you can readily retrieve and examine all of data units that refer to the same subject across all your interviews” (p. 207). Each of the interview was coded individually trying to detect key concepts that repeatedly came up by highlighting them in different text colours. Rubin & Rubin (2005) stated that in doing coding, the researcher wants to look out for concepts, themes interviewees repeatedly mentioned and indirectly revealed. The coding system was also used in order to be able to focus on the research questions and in order to classify, categorise and analyse the responses.

The dialogue between the individual teacher and me provided insight into how children use ICT. In preserving the data, the copies of the entire data set were taken. Appropriate folders were created for the interviews, voice memo and video recording.

Summary of the coding categories and themes for both the interviews and the observation

- Pedagogical documentation
- Literacy activities with the ICT devices
- Guided reading and writing
- Word study and spelling
- Transformed Practice Computer game and writing
- Teachers beliefs about the use of ICT (especially iPad)
- Social interaction
- Intra-action between the children and the ICT device

Data processing and method analysis

In this study, the language spoken by both the teachers and the children was mainly Swedish. The interviews were translated into English language in verbatim. There might be a reflection of Swedish language in my subsequent analysis.

Participant observation

Fetterman (2010) discovered in his study that “participant observation is often noncontinuous and spread out over an extended time” (p.39). However, the participant observation process took place mostly in the mornings between 10:00 am and 2:00 pm over a period of five weeks. It was an intense period because of the large number of the children (approx.. 60 children) that were involved in the process. There were also different transitions in between these times that the children were engaged in other activities. During these five weeks, there was a week sport holiday, which was used to see the video and transcribe some part of the interview that was done. Due to time constraint, few moments that were relevant to the purpose and the research questions were pointed out in this paper. The video recordings from the observation were in short clips and the clips range between 1.35 minutes to 15 minutes. The video recordings were analysed in the form of transcription. The video was watched a couple of times in order to understand how the children use the iPad and other computer devices in relation to literacy. However, this study has meticulously chosen to follow the ethical requirements of a research and made sure that every child’s identity is protected and will not be divulged or exposed by any means.

Interview

The interview questions were formulated based on the aim of the study. The important points or words that were unfamiliar but important to the objective of the research were written down. There was a challenge of understanding and hearing what one of the interviewees tried to say, but listening to the recording several times gave a clear understanding of what the interviewee was trying to say.

However, certain aspects of the interviews were not transcribed. Transcriptions were made directly on the computer because it saved a lot of time and this facilitated new ideas and critical thinking. It is helped in the reorganising the transcription and helped in the immediate manual coding of the data, giving a direct pseudonyms to the participants and to ensure confidentiality (Fetterman, 2010, p. 73)

Research Ethics

Interview and observation

Before the commencement of the interview and observation process, a consent letter was sent to the parents and staff of Petal and Rosa preschools informing them about the purpose of the study and the process of the observation. The preschool coordinators at Rosa and Petal preschools confirmed that the preschools had got a general permission from the parents and guardian for the purpose of external study that concerns education and preschool's pedagogical documentation. Similarly, the preschools' coordinators also mentioned that photo and video shot permission forms have been signed by the parents as a general school policy at the beginning of the session. As an additional effort towards obeying the ethics of research in this study, a separate consent letter was sent to the parents via email through the respective preschool coordinators. This letter included information on the study and an option to indicate the participation of their children in the video recordings and picture taking process of this study. (See Appendix 1).

Observation

Rosa Preschool

As mentioned earlier, Rosa preschool got a general permission for video recording and photographing of the children only for academic purposes and pedagogical documentation of the children's work in the preschool. However, a consent letter was sent to the parents of the children at Rosa preschool via email through the preschool coordinator. In the long run, no observation process was carried out in the preschool because of inappropriate timing.

Petal preschool

The members of staff of this preschool got a general permission from the parents to take photos and videotape of the children. The video recordings and photographs were used for the analyses in the present study. To further ensure transparency, the parents were adequately informed about the study and its purpose, and parents and guardians were advised to indicate if their children could or could not participate in the study process at any time. There was an email confirmation received from a parent that his children could participate in the observation process and that the children were allowed to be photographed and videotaped. However, this study did not focus on the personality of the children, or their individual performance, rather to observe how the children utilized iPad and other ICT device for learning related purpose. As a result of this, there was not any obvious ethical problem associated with the observation process with respect to the children. During the process of gathering the data of this study, which involved video recording and photographing, the children did not have bad emotions

about it, and no sensitive information was disclosed in describing their activities. The Swedish Science council (Vetenskapsrådet, 2011) pointed out important considerations:

”Det är viktigt att filmningen sker på ett respektfullt och ansvarsfullt sätt. Individens integritet ska respekteras. Om minderåriga ska filmas gäller samma särskilda regler som vid övrig forskning på barn” (s.43).

The above quotation explains that video recording should be done in a respectable and responsible manner, where the participants’ integrity should be considered and respected regardless of the age. Thus, the integrity of the children and the staff were considered.

During the process of the observation, there was a temporary suspension of a guardian’s consent after three weeks of the observation process. The guardian had one concern or the other on what the nature of the videos might look like. As a result, the guardian requested to see the video in Petal preschool to confirm if there was anything that was deemed uncomfortable in the video. When the guardian saw the video clip, her concerns were put to rest and she was satisfied with the content of the video.

Consequently, the guardian gave this researcher an oral consent with respect to the use of all the video clips in this study. This researcher also promised to destroy the video recordings that the child featured in at the completion of the study in accordance to the ethics of Swedish Science council (2011, p. 44). At the completion and submission of this study to the examiner and supervisor, the guardian that previously suspended her consent, as mentioned earlier, requested for a copy of the video recordings and photographs that her child featured in. These aspects of the video recordings were edited and copied for the guardian such that no other child featured in this copy.

Interviews at Petal and Rosa preschools

The teachers at Petal and Rosa preschools were personally informed orally about the objective of the research before they were interviewed while following a prepared interview guide (see Appendix 2). The participants of the interview were informed adequately about the confidentiality of their participation or involvement in the process according to the “confidentiality obligations” of the Swedish Science Council (Vetenskapsrådet, 2002, p. 16). These obligations seek to ensure the protection of all data of the participants in a research process of this nature. This data include material collection, graphics, and essay text among others. Furthermore, this researcher also informed the teachers that all the data that were collected would be used exclusively for the study. In the light of the foregoing, this project made a concerted effort to obey and observe the four ethical issues that control research, according to Swedish Science Council (Vetenskapsrådet, 2002).

The Swedish research council (Vetenskapsrådet, 2002) states the four major requirements to consider when using any of the data collection methods: Information requirement (informationskravet), consent requirement (Samtyckeskravet), confidentiality requirement (konfidentialitetskravet) and utilisation requirement (Nyttjandekravet).

The information requirement: the participants need to be informed about the purpose of the study. The participants were given clear information about the conditions attached to the project.

Consent requirement: this implies that the participants need to give their consent willingly and have the right to either participate or not. The participants have the right to discontinue at any time. All the members in my thesis gave their consents to participate in this study.

Confidentiality requirement: the identity of the participants should not be disclosed by any means. In this study, the anonymity of all participants was guaranteed. The names of the participants and preschools’ names were pseudonyms in order to protect their identity.

Utilization requirement: the data collected were primarily used for this research purpose.

All these aforementioned requirements were considered in this study during the processes of interview and observation.

The quality of the study

Validity (Interview and observation)

Halkier (2008) explained validity as what a research focuses on and sets out to explore. This research has answered the questions raised in this study. The questions were answered in a subjective way and they supported the purpose of the study, which is to explore the ways the preschool teachers and the preschool children use Information and Communication Technology (ICT) in relation to literacy.

Yin (2009 p.42) stated that there are two types of validity, which are internal and external validity. Internal validity, according to Yin (2009), seeks to ensure that the research answers the study questions, and external validity explains whether the study can be generalized or not. The outcome of this research cannot be generalised, however, the research questions have been answered adequately. Nonetheless, the possibility of transferring the outcome of this research for use in other similar context can as well not be ruled out.

Reliability (Interview and observation)

The reliability of this study refers to how the method of data collections can yield a repeatable and consistent result. Yin (2009) stated that the reliability of a study shows the degree of trustworthiness that one can find on the procedure or the instrument used and to ensure that if the same study had to be carried out by another researcher it would be almost exactly the same result. Similarly, Kananen (2011) explains the reliability of a qualitative research approach in terms of “repeatability” and “consistency” in the interpretation of the research result. In other words, this throws more light on the possibility of coming up with same results should the study be repeated. The interviews of this study were carried out from the two preschools and observation was carried out in one of the preschools. These preschools were considered viable as case study preschools. The results of the analysis carried out on the data collected from the two preschools were similar in comparison. In other words, the results from the interviews and the observations were consistent from the point of view of discussion and conclusion. The consistency in the interpretation of the research results from observation and interview methods helped to strengthen the reliability and validity of this study.

Results and analysis

How the teachers describe the use of information and communication technology, especially the use of iPad and other computer devices, in preschool in general and in relations to literacy

Information searching tool and Film creation

Linder described the use of ICT in preschool as an information-searching tool for the children. She explained that the preschool has shifted to iPad from the use of stationary computers since its launch in Sweden. She said further that, it was not the children using the iPad for information search rather it were the teachers. This, the educators do to show the children the use and the importance of iPad. Linder went further to explain that the teachers do this in order to let the children see the use of the iPad as an important tool to get information and not just a gaming tool.

Linder: We teach the children how to search information if one works with different theme. For instance, if one works with aeroplanes, we google and search for different information on aeroplanes. Although, I work with little children between 1- 3 years old but we still show them... that they can get images. Now in the group, we are working with the film creation with these little children. We created film format with the children using the children's songs and made a film together with the children. This is just a way of showing the children that one can write to get information can come up.

Linder also deemed it fit for the teachers to explain the importance of iPad to the children. It can be used to search for information based on their interest and in relation to the school theme. She gave an example of how she showed 1-3 years old how they could search for aeroplanes and cars because the children were interested in the knowing about transportation. So, she showed the children on the iPad how they can write aeroplanes using the Google search engine and explain to the children in simple terms the use of iPad as an information search tool.

Aside from information searching, Linder explained in the interview that their school use the iPad with the 1-5 year olds to create a film from their play and show it to them. That experience actually encouraged the children to want to create their own film and story line. This she said is a way of showing the children how to read and write. The children, according to Linder, read the images on the iPads and they know the meaning of the information (especially when it appears in images) once it comes up. From the educators' perspective, the iPad acts as task identification for instance information identification and documentation. The iPad, according to the educators, is a source for availability of information and ideas for teaching.

Documentation tool

In Carol's department, children were allowed to do their documentation themselves with the iPad. Linder confirmed this and said:

Exactly, there is a department where the children document their own learning themselves with the help of iPad. They have their own file where they gather and save their photographs, images, film, and sound slip they created. The children open their file and scan through.

In this interview, the iPad was used as a documentation tool. Carol who works with children ages 3,5 - 6 years said the iPad has been a very useful instrument for documentation that she did not need to waste time in creating another time for documentation. Rather, she documented the children's learning moments and wrote what the children were saying directly on the iPad. She named the following apps as important apps for documentation: Book creator, book pages, keynotes, iMovie. She analysed how fast these apps have made her teaching and documentation process of the children learning more effective.

iPad as a writing tool

iPad is also used as a writing tool such as how pen and paper are also used. Linder, Carol and Mary confirmed that the use of iPad is as good as the use of pen and paper. The use of the iPad is not scheduled and they have enough in the school that the children use at their disposal when they want. Linder confirmed that there were different apps the children could use in writing. For example, school style, and 'Stavadjur'. The teachers also mentioned in their respective interviews, that many of the apps were in English and they cannot see any hindrance in the children learning or understanding a foreign language.

How the preschool children use iPad and other information and communication technology devices in relation to reading and writing

Word Study and Spelling

Example 1

With the help of the teacher, the children clicked on the word processor. Alfonso used the mouse to click on the letters ABCDEFIHJS and told everyone around him that he has written his name. The teacher explained to the children that one could use the keyboard or the mouse to write since the keyboard is connected to the monitor. John was interested in writing his name too. He pointed at the letters that represented his name.

P: What are you doing?

Alfonso: ABCED ...S, Alfonso

John: Look, this is my letter: that one, that one, that one (He pointed on the letters he assumes represents his letter. JJJJJ).

Alfonso: It is difficult...

P: Sarah do you want to write something?

Sarah: Yeah, I want to write Sarah: SÄP...(see pic. 3)

P: Your name is so long.

Sarah: Yeah. It is.

P: How do we pronounce your name?

John: So many letters

Sarah: Yeah, it is my name.

P: This is really good. You wrote nicely.



Picture 1: Alfonson wrote his name



Picture 2: John writing his name



Picture 3: Sarah wrote her name

In the above pictures the children used a computer program called “Barnbibblan”. The teacher encouraged John to type the letters pointed at. John wrote AJJJJJJJJJ Sarah wrote SÄPNRHSPEFNAUWXI as her name. The children showed each other which letter to click and interacted, discussed on which letters form a word. They also took their turns with the help of the teacher.

Analysis

The teacher encouraged the children to practise their phonological skills by asking them how the words sounded (Macaruso and Rodman, 2011). Children were able to learn word formation. Use of iPad helps in the learner’s phonological awareness. The children were able to develop the ability to listen, identify and manipulate the letters to form a word. In other word, the use of the iPad and computer devices can help the children to be able to develop their ability to encode and decode word formation by pronouncing the words. It perhaps helped the children to understand the phonics process to develop their ability in enacting the sound and the spelling. The computer program also helped the children in both whole language learning and the bottom-up pattern for the learning of reading.

The children turned letters around and evolved new signs as they produced their own form of words and made meaning out of it. The children engaged in deliberate variations and the teacher or the adult print conventions did not limit the children. The children attempted to copy from what was seen on the keyboard and the monitor. The presentation on the software: the colourful presentation on the computer device is one of the examples of the presentation that attracts the children and contributes to the children interest in writing.

Example 2

P: What did you write? What does it mean?

John: (he kept on touching the letters and the sound was interesting to him). These are my letters.

Luke: Laughing Are these your letters... so funny.*

Mathew: I can write mamma. How do I start?

Luke: I can spell it. 'Mamma' (Mathew pronounced it).

After Mathew wrote a word, he decided to whisper to the others. (Angry bird).

P: I asked the children to write an interesting thing they have done that week.

Lovee: Wrote in Hungarian...

"At kelletemni a kötelenmeni es utana. dobalnikellet. a ilyen. ertpåsetdobaltunk. tudod.? anya."

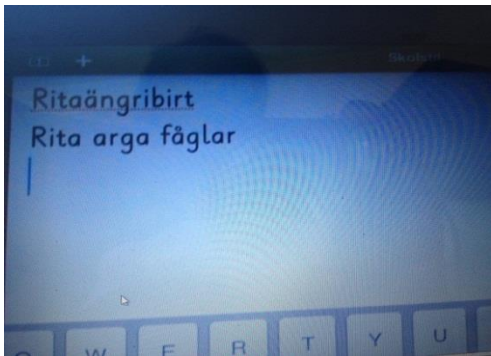
P: Very good. I don't understand what you have just written. Do you want to explain to me?

Lovee: Yeah. (He translated it to Swedish).

Translation (English): "At first we went over an obstacle course and then we picked a pea bag and went later to join the line. I did this two times".

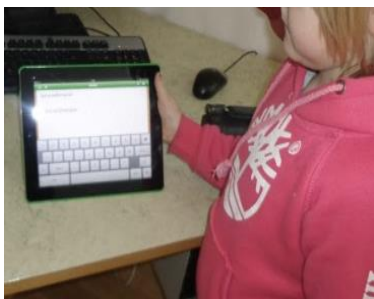
P: Awesome! Very good job.

Mark: It's my turn. He wrote: Ritaänribirt (I drew angry bird).



Picture 4: (Roman got help from the Mark to write his name)

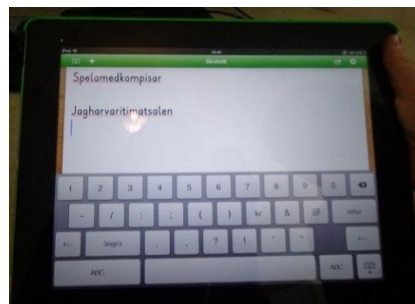
Example 3



Picture 5

Selina wrote: I have played with friends

I have been in the dining hall.



Picture 6

Analyses of Examples 2 and 3

The above application that the children used on the iPad was called “School style”. The children could write one word or phrases. They could describe what they had done with a word or phrase. In this case, the children learned to read and write, not only that, they also built up the ability to express themselves, using necessary class of words appropriately. The use of iPad helped the children to learn a new language other than Swedish, (since most of the apps on the tablet computer are developed in English, like Create a car, king of maths, kids Maths Dots, Pettson’s inventions, toy story, free write draw, etc). The use of the tablet computer like iPad supports and encourages the children’s writing skills. The iPad as a tablet computer is a visual tool, which draws the children attention and interest to writing. It allows creative thinking, writing and application the skills acquired in writing. This is because writing on the device can contribute to the vocabulary development of the child. It also developed the organisational skill of the child. How? It helped the children to organise the word class orderly and be able to use them accordingly.

How the use of iPad and other ICT devices promote social interaction amongst the children

Social interaction and intra-action

Example 4



Matthew, Mark, Luke, Roman, and Paul were focusing on an automobile construction game, “Create a car”. In this game, an individual was meant to build his own type of car in order to survive the road obstruction. The road was full of obstacles and the car was meant to be built to builder’s taste and the like. If the car was able to survive the challenge then the builder became the winner. The five children decided to help Paul in this construction. The children advised Paul on how to carry out his construction and encouraged him to win the challenge. Matthew

decided that he would name the car ‘Full’ and the other children found it hilarious.

Mathew: Look at the wheels... they are moving towards you.

Roman: Waoh, look at those (pointing to the obstacles on the road)

*Others: Laughing**

As Paul was crushing the obstacles, the other children celebrated and were excited about Paul’s triumph. This encouraged Paul to keep on with his movement.

Analysis

The children were playing as a team and encouraging success. This helps to boost Paul’s self-confidence and encourages him to keep on playing. The other children around Paul help him to learn new skill on how to think when constructing a car. This is learning with other children who share their

knowledge in construction, making the game more educating and encouraging for Paul. This is also getting help in learning a new strategy to solving a problem. The use of the iPad actually has encourages collective learning, physical, social and intellectual performance of the children.

Example 5



John, Sarah, Edmond, Valmont, Cecilia playing a word game called memory matches. The game is about finding a matching card, which means the picture on the card at the top must match another picture at the bottom. These cards include the images of different musical instruments and other related pictures at the top and bottom. Sarah took turn from John. She touches the upper card and the bottom card to find the right image on the card. Whenever she matches the right cards, the other children around her respond by

saying “Yes” and if she gets it wrong, they chorus “NO”. Their responses motivated Sarah to want to learn more. Other children wanted to touch the screen of the iPad in order to show her the correct card to choose from.

Analysis

Sarah was able to achieve her aim by using a repeated pattern style. From the Knowledge from the program, she kept on guessing and she was able to achieve her aim by collaborating with her friends, which encourages her with the words. Sarah had a task to carry out and she was focused. The other children’s contribution to the execution of the exercise was meaningful and encouraging. The use of the iPad has contributed immensely to achieving her goal.

Discussion

The scope of this study covers the use of ICT in developing the literacy skills of the children. This study has revealed to the children the everyday use of tablet computer in relation to literacy. It also covers how the teachers use the ICT to facilitate reading and writing of the preschool children.

Method discussion

The strength of the qualitative method is that it allows flexibility, attainment of the understanding of the subject, and the quality of data collected accounts for any deviant cases. The interview method gave extensive information along with observations and credible answers to the study's questions. To record the interviews and video some of the consequences in the observation process were an advantage. The interview facilitates concentration on the objective of the study. The interview was transcribed and it was read several times. Thus, making it possible for coding the main points the interviewees tried to talk about. There are also disadvantages. One of the disadvantages is that interview as a method can be time-consuming (Bell, 2006). Another setback with interview method is that results may be influenced by the interviewer's subjective interpretation and analyses of the interviewees' answers. The observation is a participant method and it was a challenge to be able to see everything in the preschool learning area because the children are very active.

The aim during the analyses of the methods is to conduct the interview and observation as objectively as possible. The interpretation of what the educators might have been subjectively interpreted by the interview and this cannot be ignored. This is because personal experiences contribute to the result of the analyses. An advantage of the preschools chosen was the referral information received in advance and the search done beforehand that the preschools use ICT tools in the preschool. Combining interview and observation have, to an extent, contributed to the richness of the data collection.

Other aspects have affected the process of the data collection and the results of this research. The interviews at Rosa preschool was a challenge because of the predetermined time with the teachers, which was affected by sicknesses and inadequate transportation to the preschool. When the interview was conducted, two teachers voluntarily eventually granted the interview. Another aspect of the challenge was that some of the questions were not answered. During data analysis, it was a challenge to get the focus of the purpose of the study. During the time of transcription, the experience of the interviewer was challenged. It was estimated to ask follow-up questions during interview but it turned out that it was not frequent, although, follow-up questions popped up without pre-plan.

Summarily, this study has been faced with different challenges during the process of carrying out of the research. According to Robson (2002), there are three major threats a researcher might face in the process of researching. These three threats are participants' error, participant's bias, and interviewer's or observer's bias. These three concepts were considered in going about the interview process. Looking at the participant's error, the teachers were interviewed in their respective preschools and this made the interviewees to be more relaxed and comfortable. The children were comfortable with the

photographing and video recording because they were already used to these tools in their preschool. The participants' bias was a challenge to the project but it was taken care of by having the individual interview and making the interviewees express themselves freely. Apart from that, the introduction of the purpose of the study was well explained to the teachers and its ethical background was also made known to them. For instance, in Petal Preschool, interview questions were sent to the interviewees few days before the interview commenced. The third error is often related to the researcher. This error was minimized by using the digital tools available to record the interviews and the observations.

Results discussion

The interest in the use of iPad in the early childhood is on the increase. In the observation, the applications used by the children can be linked to the behaviourist theory. The children get credits for their performances in the games. The educational applications (apps) on the iPads can be related to the Pressey's teaching machine which is described to be a tool for instruction, correction and reinforcement. Skinner's (1958) description of Pressey's machine is meant to give the results and "teach". However, iPad can be seen as an instructional tool.

One of the outcomes of the research is that using information and communication technology devices like iPad, or other tablet computers and computer devices in early childhood education has come a long way. The behaviourist theory in education has gained ground in development of computer software to suite the growth of positive reinforcement to contribute in literacy development. However, there is other complexity in the "teaching machine" (Skinner, 1958, p. 969); (computer devices or software can be called today the "teaching machines"), which the children could use conveniently in developing their writing skills even at a very early age.

Another outcome of the research can be connected to the constructivism/cognitive theory on information searching which the teachers ascribed to a good function of the use of iPad in the daily activity with the children. The software or applications (apps as being called) on the iPad can be seen as a tool for implementation of the instructions programmed in the software to help the children to read images. Through the reading of images or the pictures, it engages and encouraged the children in the construction of the knowledge, understanding the meaning of the images.

This study has revealed that literacy is not a one-way approach rather it involves "multiple, complex process" (Everett, 2006, p.16). This involves the interaction of the children with one another and with the digital tools, which involves creation of signs, symbols, images and so on. We take for instance, in example 4, where the children were engaged in car construction on the iPad. They were not just building the skills for construction, they were also developing their writing skill, reading ability, understanding the concept and carrying out basic exercises. This creates communication through interaction. Apps like Create a car, stava djur and memory matches have an interactive platform where the children learn from each other and the learning task was tailored to the capability of the children. The creation of the learning platform encourages the reading and writing capability of the children at early age. Early child reading and writing ability develops by using constructivist approach to ICT, allowing the children to construct their own knowledge, and creating ideas on how the game can be played in another perspective based on generalised skills. We look into the interview with Linder, where she made mention the activities of the iPad with 1-3 years old. They used the tablet (iPad) as a searching tool, in order to show the children the other functions of the tool based on generalised skill. Nevertheless, the interaction is also seen through a social-cultural perspective, where the iPad can be seen as a social scaffolding interactive tool (Shield, 2000, fig.3). Using the modelling strategy, the

apps on the iPad provide the systematic procedure in how to carry out a task. In examples 4 and 5, there are layout tasks and instructions the children need to follow in order to achieve their task. Some of the 5 to 6,5 year olds involved in this study are already advancing in their reading and writing. For instance in examples 2 and 3 respectively, Lovee and Selina respectively wrote a sentence describing what they have done that day.

There are also two categories mentioned by Vygotsky in the social cultural development of a learner as mentioned by Lim (2002): interpsychological and intrapsychological categories. This can be related to the function of the computer devices, for instance, in example 4, the instructions that have been incorporated into the iPad's apps on how to carry out the exercise can be regarded as the interpsychological category. The interpsychological category stated involves adult-child instructional interaction. The intrapsychological category can be related to how a child like "Mathew" (in example 4) carries out or makes use of the instruction on how to create a car. However, the iPad as a tool can be seen in this regard as the tool that bridges some of the gaps between interpsychological and intrapsychological categories. For example in examples 1 and 2 where the teacher (P) was a kick starter of the conversation and the teacher questions and responses encourages the children to carry out the activities as they understood it the instructions giving on the computer. In other words, the tablet computers or computer devices can be regarded as a tool of mediation that facilitates and shapes learning. Looking at the software or the applications on the iPad, it can be seen as an instructional tool that gives a systematic procedure about how certain games should be played (Cook & Finlayson, 1999, p.99). This study also shows that tablet computers were found attractive and motivating possibly because the applications were designed based on the rewards received after each step of the procedure. These regards were recorded sounds and gestures from the applications.

There is a learning interaction amongst the children engaged in using ICT. They were encouraging and helping each other in learning. This can be connected to one of Tharpe's strategy. This strategy indicated the influence of peer pressure on one another. In examples 4 and 5, model a problem solving techniques. It guides the way the game can be played and proffered appropriate solution to the problem through experience. This means that the children were able to interact with each other, commenting on the process when their peer was playing with the apps. By so doing the "Children guided the thinking of others by their comments, suggestions, connections" (Cook & Finlayson, 1999, p.99). The iPad can, however, be a stimulator and facilitate the children in contributing to the literacy practice of their peer by guiding and suggesting the way the games should be played. The possibility that IPAD and ICT MAY ENHANCE the learning process of the children cannot be ruled out based on past research, and the result of this research. However, the precise ability of iPad and ICT to improve the learning process of the children can only be confirmed affirmatively by carrying out the necessary test in this regard.

Another important aspect this study revealed is that the use of iPad is not just meant for the development of skills among the children, it is also a tool for the development of skills, knowledge and values (Shield, 2000) in the teaching profession among the teachers. This material encourages and motivates the educators to carry out their work appropriately. In the interview with Linder, she mentioned that the preschool teachers use the iPad in the classroom with the children and it enables fast documentation of the children's work. The teachers did not have to create separate time for the documentation which means that time and energy is being saved by using iPad. One of the points drawn from the interview, apart from the time management is accessibility and handiness of the tool. iPad is light weighted and easy for both the children and the teachers to be able to move around with.

The result of the study also shows that iPad and other electronic devices used in the learning environment facilitate the interaction and intra-action connection of the children, motivating and

facilitating literacy. The iPad, the computers, adults, the learning environment are the motivating matter (Hultman, 20011 and Barad, 2012) that generate intra-action. Hultman (2011) stated that there are nonhuman matters or substances that facilitate learning and have an influence on the human subjectivity. Hultman explains that it is not only the human factors like culture, language, discourse or human social interaction that are important in the construction of knowledge or that facilitates learning, rather, there are other nonhuman factors that are considered 'dead', just like the colour presentation on the apps, the sound from the computer, the recorded voices on the apps that encourage the children to read, write and learn more generally. For instance, in Example 1, when John and his friends were writing their names, the sound of the letters facilitated the learning of phonemes. By so doing, this help in the phonological awareness of the children.

Another important outcome is that the iPad can be used for documentation of the children learning development. In the interview with the educators, they mentioned that the iPad is being used as a documentation tool where the children can take photographs, tell a story and create their own documentation and also have the opportunity to reflect over their learning. Barad (2012) analysed metaphysics and ethico-onto-epistemology in relation to intra-action. Barad explained that human intra-action with non-human matters function together, which, therefore, explains that the use of the iPad (iPad as non-human matter) has facilitated smooth pedagogical documentation for both the teachers and the children. In other word, iPad can be seen as an active tool or performative agent (Palmer, 2009 and Barad, 2012) that aids and facilitates reading and writing.

Conclusion

This study has shown that quite a number of electronic materials such as iPad and other computer devices are important for learning how to read and write. We cannot separate the use of iPad or computer devices from literacy. They have a way of facilitating children's ability to read and write when they are effectively used for such purpose. Taking us back a little bit to the Linder's response to the interview, she explained one of the ways they used the iPad with the 1-3 years olds. She said that they showed the children how to search for information about aeroplanes. Which, at this age, the children can only read the images on the iPad and express their thoughts via body language and gestures and some phrases depending on the language level or skill of the children she was referring to. iPad and other ICT devices can be referred to as a performative agent that causes an action that facilitates learning among the children.

This study provided insight into different functions of literacies and the multiple modes of literacy media, which supports written language development in preschool children. Emphasis was also placed on iPad because it is a new device in the ICT and this is more attractive to the children than any other computer devices. This, however, made the teachers in Rosa preschool re-channel the focus of the children from just playing a game to a formal learning tool in the preschool. The overall results in the study showed that ICT presents a meaningful way in reading and writing and promote the social interaction and integration of the children.

Recommendation for further studies

The context of this research cited the use of iPad and other ICT devices in early childhood education in relation to literacy. The Swedish national preschool curriculum mandated the use of ICT in the preschool to facilitate literacy instructional practices. It might be an opportunity for the preschool

educators to start acknowledging social and cultural contexts, and remove any bias about the lack of concentration of the children in learning. In this study, the use of ICT facilitated literacy and literacy is acknowledged as a social practice.

There were questions that emerged during the course of this research that I will like to highlight and it will be recommended for future research:

- What are the complexities or hindrances that the use of ICT might encounter?
- How can the use of iPad support the children with special needs?
- Can the use of ICT or the tablet computer provides more opportunities for communication and consequently create more life pathways?

References

- Alexandersson, M. & Linderöth, J. & Lindö, R. (2001). *Bland barn och datorer. Lärandets villkor i mötet med nya medier*. Lund: Studentlitteratur.
- Barad K (2012) "Intra-actions" Interview of Karen Barad by Adam Kleinmann, *Special dOCUMENTA*, 13 Milan, Italy. Electronic resource: http://www.academia.edu/1857617/_Intra-actions_Interview_of_Karen_Barad_by_Adam_Kleinmann
- Bell, J. (2006). *Introduktion till forskningsmetodik*. (4th ed.). Lund: Studentlitteratur
- Charoenruk, Duangtip (2012). Communication research methodologies: Qualitative and quantitative methodology. Available at: http://utcc2.utcc.ac.th/amsar/PDF/Documents49/quantitative_and_qualitative_methodologies.pdf
- Cook, D. & Finlayson, H. (1999). *Interactive children, communicative teaching: ICT and classroom teaching*. Buckingham: Open University Press
- Couse, L. J. & Chen, D.W. (2010). A Tablet Computer for Young Children? Exploring its viability for early childhood education. *Journal of Research on Technology in Education*, 43, (1), 75–98
- Daal, V.H.P. & Reitsma, P. (2000). Computer-assisted learning to read and spell: results from two pilot studies. *Journal of Research in Reading*, 23(2), 181- 193.
- Dahlberg, G. & Moss, P. (2005). *Ethics and politics in early childhood education*. London: RoutledgeFalmer.
- Denscombe, M. (2007). *The good research guide: for small-scale social research projects*. (3rd ed.). Berkshire: McGraw-Hill Education
- DeWalt, K.M. & DeWalt, B. R. (2011). *Participant observation: A guide for fieldworkers*. Plymouth: AltaMira Press
- Duranti, A. (2001). Key terms in language and culture. Malden, MA: Blackwell
- Fagan, W.T. (2003). The identification and description of literacy events in which children engage during and after parental involvement in a family literacy program. Research paper, National Adult Literacy Database, Canada. <http://www.nald.ca/library/research/fagan/completed.pdf>
- Everett, T. E. (2006). Multiliteracies in early childhood education: The modes and media of communication by first grade students. (Doctoral Dissertation). Iowa: Graduate College of University of Iowa. Retrieved from <http://ir.uiowa.edu/cgi/viewcontent.cgi?article=1276&context=etd>.
- Fetterman, D. M. (2010). *Ethnography: Step-by-step*. (3rd ed.). California: SAGE Publications, Inc
- Gravetter, F. J. & Forzano, L. B. (2011). *Research methods for the behavioural sciences*, (4th ed.). Belmont, CA: Wadsworth Cengage Learning
- Halkier, B. (2008). *Fokusgrupper*. Stockholm: Liber
- Hultman, K. (2011). *Barn, linjaler och andra aktörer: Posthumanistiska perspektiv på subjektskapande och materialitet i förskola/skola*. (Doctoral dissertation). Stockholm: Department of Education, Stockholm University.
- Imsen, G. (2006) *Elevers värld: introduktion till pedagogisk psykologi*. Lund: Studentlitteratur.
- Kananen, J. (2011). *Rafting through the thesis process: Step by step guide to thesis research*. Tampere: JAMK University of Applied Sciences.
- Kennedy, E., Dunphy, E., Dwyer, B., Hayes, G., McPhillips, T., Marsh, J., O'Connor, M., & Shiel, G. (2012). *Literacy in early childhood and primary education* (Children aged 3-8 Years) (Commissioned research report, National Council of Curriculum and Assessment (NCCA)).
Retrievable from www.ncca.ie
- Kress, G. & Van Leeuwen, T. (2001). *Multimodal discourse: The modes and media of contemporary communication*. New York, NY: Oxford University Press
- Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. New York: Routledge
- Lim, C. P. (2002.). A theoretical framework for the study of ICT in schools: A proposal. *British Journal of Educational Technology*. 33(4), 411–421.

- Lundkvist, M. (2005). *Förskolans datorkultur i barn –och vuxenperspektiv*. (Doctoral dissertation). Finland: Multiprint
- Macaruso, P. & Rodman, A. (2011). Efficacy of computer-assisted instruction for the development of early literacy skills in young children. *Reading Psychology*, 32, 172–196.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.
- Myers, J. (2006). Literacy practices and digital literacies: A commentary on Swenson, Rozema, Young, McGrail, and Whitin. *Contemporary Issues in Technology and Teacher Education*, 6(1), 61–66.
- National agency for education (2011). *Curriculum for the preschool - Lpfö98* (revised 2010). Stockholm: Fritzes.
- Palmer, A. (2009). "I'm not a "maths-person"! Reconstituting mathematical subjectivities in aesthetic teaching practices', *Gender and Education*, 21(4), 387 — 404. doi: 10.1080/09540250802467950
- Patton, M. (1990). *Qualitative evaluation and research methods*. Beverly Hills, CA: Sage.
- Reinharz, S. (1998). *On becoming a social scientist: from survey research and participant observation to experiential analysis*. New Jersey: Transaction Publishers
- Robson, C. (2002). *Real world research*. (2nd ed.). New York: Wiley-Blackwell Publishing.
- Rosen, L.D., Carrier, M.L. & Cheever, N.A. (2010). *Rewired: understanding the iGeneration and the way they learn*. New York: Palgrave Macmillan
- Rubin, H. J. & Rubin, I. (2005). *Qualitative interviewing the art of hearing data*. Thousand Oaks, CA: SAGE Publications Inc
- Shield, G. (2000). A critical appraisal of learning technology using information and communication technologies. *Journal of Technology Studies*, 26 (1), 71-79.
- Shilling, W.A. (1997). Young children using computers to make discoveries about written language. *Early Childhood Education Journal*, 24(4), 253-259.
- Skinner, B.F. (1958). Teaching machines. *Science New Series*, 128 (3330), 969-977.
- Stukat, S. (2005) *Att skriva examensarbete inom utbildningsvetenskap*. Lund: Studentlitteratur.
- Swedish Science Council (2011). *God forskningssed*. Stockholm: CM-Gruppen AB. Retrieved from <http://www.vr.se/download/18.3a36c20d133af0c12958000491>
- Wibeck, V. (2000). *Fokusgrupper: om fokuserade gruppintervjuer som undersökningsmetod*. Lund: Studentlitteratur AB
- UNESCO (2002). *Information and communication technology: A curriculum for schools and programme teacher development*. Paris: Division of Higher Education.
- UNESCO (2005). *Education for all: literacy for life*. Paris: Graphoprint
- UNESCO (2011). *ICT in primary education*. Moscow: Institute for Information Technologies in Education
- Vetenskapsrådet. (2002). Forskningsetiska principer inom humanistisk-samhällsvetenskaplig forskning. Retrieved from <http://www.codex.vr.se/texts/HSFR.pdf>
- Wang, F., Kinzie, M.B., McGuire, P., & Pan, E. (2009). Applying technology to inquiry-based learning in early childhood education. *Early Childhood Education Journal*, 37, 381–389. doi 10.1007/s10643-009-0364-6
www.apple.com/iPad
www.wikipedia.org/wiki/iPad
- Yin, R.K. (2009). *Case study research. Design and methods*. (4thed.). Thousand Oaks, CA: Sage Publications.

Appendixes

Appendix 1

Hej föräldrar /Vårdnadshavare,

Mitt namn är Olayemi Oladunjoye. Jag är en pedagog och en magisterstudent vid Barn- och ungdomsvetenskapliga institutionen vid Stockholms Universitet, och genomför ett uppsatsarbete. Mitt uppsatsarbete handlar om literacy i samband med Multimedia och IKT (Informations- och Kommunikationsteknologi).

Syftet med mitt projekt är att följa hur förskolan arbetar med multimedia och IKT i samband med läs- och skrivövningar och att utforska hur barnen i förskolan börjar lära sig läs- och skrivning med hjälp av IKT.

I detta projekt kommer jag fotografera och att video inspela barn när de använder IKT-utrustning och detta börjar i vecka 7 och pågår fram till vecka 11. För detta behöver jag ert godkännande som vårdnadshavare. **Fotografering och video inspelning är enbart till för detta uppsats arbete.** Fokus i detta arbete är inte på barnen i denna förskola utan fokus är på den pedagogiska verksamheten med multimedia och IKT.

Resultaten i uppsatsen kommer att behandlas konfidentiellt vilket innebär att det inte går att utläsa namn på barn eller förskola.

Om ni absolut inte vill att er barns vara med i video inspelningen kan ni informera personalen i förskolan om detta. Deltagande är frivilligt, och om barnen visar tecken på att inte vilja vara med tar jag givetvis hänsyn till detta . Har ni frågor eller funderingar är ni välkomna att höra av er.

Med vänligen hälsningar,

Yemi Oladunjoye

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Appendix 2

Interview guide

Hi,

I am a Masters (60c) student at the Institute of Child and Youth Studies, Stockholm's University. I will be carrying out a research in the use of Information and Communications Technology in preschool. I, therefore, will like to seek your consent to record the interview if you give your consent. This interview will take approximately 30 minutes and this is the voice recording I will be use in the written research.

Confidentiality

This interview is confidential and your name or the name of your school will not be mentioned in the research.

The objective of the study

The purpose of this study is to explore how the children and the teachers use the ICT in early childhood education.

Your Background

Position: Teacher assistant: ... Preschool teacher: ... Others: ...

IT Competence: ...

Age: ... (20-30, 30-40, 40-50)

Sex: M or F

Interview Questions

Which age group do you teach?

What kind of ICT material do you use with the children? Laptop? Stationary computer? Tablets or portable reading device (iPad, kindle)? And why?

What kind of activities do you associate with multimedia and information technology in preschool?

What kind of literacy practices do you or the preschool involve the children with?

What kinds of program do you use with the children?

How often do you use the ICT with the child?

In what ways do the children get involved?

How often do the children use the ICT in your preschool?

Is there any benefit with the use of the ICT?

Do you think the use of the ICT support children's literacy? In what ways?

In what ways do the children combine text with drawings?

How can ICT be used in an effective way?

Follow up questions

How do you mean?

Can you explain?

Examples?

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