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Can I play on the Computer? The Construct of Digital Play from the Perspective of UK Nursery-aged Children in Early Childhood Settings

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Abstract:

The study reported here explores nursery-aged children's perceptions of ICT-based experiences. A series of ethnographic case studies was conducted in three private nurseries in the UK, using participant observations, drawing and field notes, in addition to discussions with children. The participant children (n = 65) were three and four years old. Using their own words, the data analysis captured children's perspectives on encounters with the technologies available in the nurseries. The findings demonstrate how the children constructed their experiences with these technological resources as 'play' in their social interactions, with some tension between a preference to share their play with a friend or friends and a desire for personal ownership of the experiences. They co-constructed this 'play' drawing on preferences for agency, social roles, gender differences and moral thinking together with technological positioning. The article concludes by suggesting pedagogical points for early childhood communities and directions for further research.

Keywords: *early childhood education, children's perceptions, ICT, digital play, pedagogy, ethnography*

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I. INTRODUCTION

Currently, some of the world is characterised as digital; children play with digital toys and other technologies, and the concept of digital play has been developed (e.g., Stephen & Plowman, 2014; Yelland, 2011). While play is often used to describe children's experiences with new technologies in the nursery, and the children themselves tend to label these experiences as play (Plowman & Stephen, 2007), how they perceive this play is still unclear. We know from research on children's experiences in nursery that they tend to associate play with activities that are free, voluntary, fun and with friends, and distinguish play from work (e.g., Barnet, 2013; Duncan, 2015; Factor, 2009; Howard, 2002; Wiltz & Klein, 2001). For instance, Duncan (2015) explored children's perspectives on play and found that children tended to view as play experiences that were amusing, entertaining, playful, animated, and where the children experienced autonomy. Another study by Truong and Mahon (2012) with Thai children showed that having access to play, the children experienced sense of play when they meaningfully attached meanings to spaces used in their play.

Technology continues to be debated in early childhood education with regards to its potential in a play-based environment. In particular, children's activities with technology do not resonate with educators' conceptions of play-based learning with traditional activities; hence, professionals tend to limit children's time on technological activities (Edwards, 2013). Policy in the UK tends to consider use of technology as an outcome rather than an activity contributing to learning (ibid.). In early years education, curriculum 'norms' often position play and technology as oppositional, alienating technology from young children's play environments (Edwards et al., 2016; Marsh, 2010).

Such debates are from an adult perspective; children themselves are under-represented. Hearing the voices of children regarding digital play throws new light on the role of digital play in the classroom, contributing to better understanding. How do nursery-age children perceive digital play in early childhood settings? This is the research question addressed in this article. The term 'play', used to describe ICT-based activities, was initiated by the children; this paper explores how children perceive such play.

The article starts with a brief literature review. Then the study is outlined and its methodological framing and methods of data collection, before the findings are discussed and conclusions drawn. The article concludes with implications for research and practice in early childhood education.

II. LITERATURE REVIEW

The experiences of nursery-aged children with ICT represent an ever-growing area of literature and research (e.g., Marsh et al., 2016; NAEYC, 2012; Plowman et al. 2008; 2010; 2012); such research has thrown valuable light on particular aspects of children's use of technology. For example, Marsh et al. (2016) found that children's play with technology is comparable to normal play. Hence, they created a new classification of children's digital play, whereby this play has 16 types (e.g., symbolic play, rough and tumble play, socio-dramatic play, etc.). Other studies (e.g., Plowman & Stephen, 2005; Plowman et al., 2008; 2010; Plowman & Hancock, 2014) researched children's experiences of technologies across home and nursery, showing that children can be immersed in a media-rich environment from a very young age, and that their learning about technological tools is socially mediated. Relatively few studies have explored young children's perceptions of ICT in early childhood settings (e.g., Arnott, 2013; McKenney & Voogt, 2010; Yanez & Coyle, 2010). Younger children's play with technology is still an area that necessitates further exploration (Stephen & Plowman, 2014).

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Arnott (2013) looked at the nature of social interactions that took place when three-to-five-year-old children use technologies. The study showed that children tended to form four different positions in their interactions: owner, spectator, parallel owner, and mutual owner (ibid, p. 104). In assuming the role of the leader, young children followed either a dominant or a diplomatic approach. In the dominant approach, the children used their position to exclude others from play and achieve their own goals, while in the later they negotiated and compromised. Arnott concludes by suggesting that technologies created a potential for action and interaction, but it was children who made choices, negotiated their own agendas and developed their social roles and positons. Hence, 'intersubjectivity, coupled with the affordances of resources, facilitated mutual control' (ibid, 111). However, it is not clear from the paper how children defined their play with technologies.

Research on technology in early childhood education has progressed from debating the appropriateness of technology to discussing how young children best learn to use technology through play (e.g., Bird & Edwards, 2015). Research in this area has explored: young children's play with technologies (Leong & Bodrova, 2012; Smirnova, 2011); how children learn to use technologies through play (e.g., Bird & Edwards, 2015); the potential of technology to enhance children's learning and development (e.g., Plowman et al., 2012). While research continues to explore the dimensions of children's digital/technological play (e.g., Arnott, 2016; Marsh et al., 2016), little attention has been directed towards young children's perceptions of using technology (Bird & Edward, 2015).

By exploring how young children perceive their ICT-based play experiences through social actions and interactions, and by listening to their voices and presenting their stories, this article contributes to relating play to new technology and pedagogical practices that may support learning (Yelland, 2011). Therefore, the research question that this article sets to answer is: how do nursery-aged children perceive their ICT-based activities?

III. THE STUDY

The approach to gaining access to the children's world was through in-depth qualitative ethnographic case studies of three nursery settings. Ethnography requires that the research be carried out in the natural setting and that the phenomenon of interest is explored from the standpoint of these being researched as they live in their everyday settings (Murchison, 2010). Correspondingly, ethnography allows the researcher to have the advantages of direct participation in the naturally-occurring cultural practices of the setting, taking part, observing and interacting with its members.

Over half the children in each classroom were invited to talk about their experiences with technology. All children gave informed assent, and were consulted on where and when to hold discussions; they were asked for their permission to record the discussions. The children proved to have insightful perspectives on their experiences in the classroom and can be thought of as 'experts by experience'.

Context

The three nursery settings, located in the West Midlands region of the UK, follow the Early Years Foundation Stage curriculum (DFE, 2014). One nursery (known as W) was university-run; the other two were privately run (B and S). All were registered, with inspection reports rated excellent. The settings each provided full-day education and care to young children aged three months to four years.

The W setting was unusually international as it was affiliated to a university which attracts many students from overseas. It has children from ethnically diverse backgrounds: Chinese, Pakistani, Korean, Turkish and British. The children were from different religious backgrounds, including Christian and Muslim. They were mainly from an affluent, educated socio-economic background. The other two settings were less mixed, as there were no international parents. In S setting, the children were white British with only one black child. The children were from middle and working class backgrounds. Setting B was similar except that there was one Portuguese girl and one Spanish boy.

In each setting, there was a large classroom accommodating 20 to 33 children. Each classroom had four female practitioners. Some of the practitioners worked full-time, others worked part-time. In terms of ICT equipment, each classroom had a desktop computer around which the children could comfortably sit, a CD player, musical keyboards and replica ICT tools such as keyboards, cameras, computers, and mobile phones for children to play with (see table 1). Two settings (B and S) had overhead projection, while the third (W) had an Interactive Whiteboard, for whole class activities. The desktop computers were equipped with scanners and printers which children could use.

Each setting had an ICT policy promoting use of tools as a part of a balanced curriculum. In practice, children would choose their own ICT-based activities, which were unstructured. Time for computer activities was curtailed and mainly carried out during free play time. Overhead projection was used in a whole-class context for viewing a DVD or YouTube. CD players were mostly used during circle time for playing stories and singing songs.

There were some similarities in physical arrangement of equipment and in organisation of daily schedule (e.g., circle time, desktop computer area, tables for children, etc.). There were some differences in terms of the amount of structure in children's ICT activities. ICT activities mostly took place in free play periods but, in setting W, there was more structure; practitioners were more involved in children's ICT activities, overseeing the rules, solving disputes, and limiting children's time with ICT. The detailed distribution of ICT resources by setting is given in Table 1.

Table 1. ICT resources available to children in each setting

ICT resource	W setting	B setting	S setting
Desktop/Laptop computer	✓	✓	✓
IWB	✓		✓
CD player	✓	✓	✓
Bee-Bot	✓		
ICT replica tools	✓	✓	✓
Torches	✓	✓	✓
Camera/pretend camera	✓	✓	✓
Prentend mobile phones	✓	✓	✓
Internet	✓		✓
iPad			✓

Procedure

All parents of three- and four-year olds and staff in the three nurseries were sent consent forms describing the research aims and procedures proposed. Confidentiality was stressed, as was the right of the children to withhold their participation if they wished to. British Education Research Association ethical guidelines (BERA, 2011) were followed throughout. In total, 65 children (41 boys and 24 girls) participated in this study.

The researcher participated in the settings as a participant observer and spent roughly four months in each of the three settings (April 2013 - April 2014), observing, and taking part in, children's daily activities on a full-day basis.

In particular, children were observed undertaking ICT-based activities, and then prompted to talk about these activities. The observations (over 60) were unstructured, allowing enough flexibility for categories to emerge from the data. Each observation lasted between 5 minutes and roughly two hours. While conducting observations, field notes and 50 video-recordings were made of children's activities; nearly every observation of children's interaction within the context of technology activities was recorded. Videos provide detailed rich documentation of children's interactions in their daily context (Gillen et al., 2006). Observations were triangulated by talking to the children (Mok & Clarke, 2015). Participant observation allowed for clarification from the children at a time appropriate for them, without interrupting their activities.

Children were interviewed informally either during or after an ICT-based session, seeking minimal disruption, and using questions such as: What do you do in the nursery? What are children doing at the computer? Why do you think that? Do you prefer to be on your own? What about your friends?

The children also were invited to draw their perspectives on play and technology using a question: 'Will you draw yourself playing with a computer?' The choice of the computer was based on its availability in all the three settings. As a form of visual representation of children's thoughts (Duncan, 2015), drawing can capture some aspects of children's points of view and promoted informal talk. Drawing can motivate children to elaborate on their preferences, interests and ideas, and to feel confident in explaining their views (Pagett, 2006).

Children's permission was sought to make copies of their drawings and other products they made while playing with ICT, then these were returned to them.

IV. DATA ANALYSIS

The observations, conversations with the children, and the audio recordings of their descriptions and explanations of their drawings were transcribed. The transcriptions were analysed using the Thematic Analysis Framework, a process of looking for patterns of meaning across the dataset (Braun & Clarke, 2006). This process consisted of six stages: familiarity with the transcription; initial codes generation; searching for themes; reviewing themes to ensure the meanings of the participants were captured; defining and naming themes; and writing up. Hence, analysing the data set was inductive, as the patterns of meaning emerged from the data. This process of data analysis led to developing the following sub-themes of play: ownership, fairness, friendship, fun and gender.

As participant observer, the researcher followed a reactive strategy, whereby he waited for children to come to him and get to know him and then gradually the researcher was invited to the children's play (Corsaro, 1981).

In order to optimise the trustworthiness of the study, the researcher used triangulation between multiple sources of data, such as drawings, observations, discussions with children. In addition, after transcribing observations, the researcher asked children about their motives for behaving the way they did and to explain their preferences, and the practitioners were consulted; also participants from three different nurseries took part.

V. FINDINGS

All the participant children, regardless of their gender, ethnic and cultural background, and socio-economic status, conceptualised their experiences with ICT technologies as play. Their views on these activities followed a general pattern in spite of existent differences among the classroom structures. The common characteristics among ICT-based activities that account for their being categorised as play were not easy to find. Helpful clues came from analysing the context in which these activities took place. This was possible because ethnography requires 'thick description' (Geertz, 1973, p. 10), which provides rich contextual details that convey the 'flesh and blood' aspects of reality (Boocock & Scott, 2005, p. 37, inverted commas in original).

Observing the naturally-unfolding talk among children about their ICT activities provided evidence of the way in which they constructed what they did in the context of ICT activities. Here are two examples from fieldwork observations.

> Kate had printed some pictures and put them on a table. She also put colours. Four children, Chris, Marie, May and Ali started colouring. I managed to sit close to them without disturbing their activity so that I could hear their conversation:
>
> Chris: You know what I play on my Dad's computer? You know what I play, you know what I play?
>
> Marie: Sequegles!
>
> Chris: You know what I did on… you know what I like to watch on Dad's computer?
>
> Marie: [Shaking her head to indicate no]
>
> Chris: The Lingo Show hhhhhhhhhhh (laughing). And I watch Lingo Show every day and play on the computer. I always watch it every time I go on the computer. I always, always watch The Lingo Show but not again and again I just watch it one
>
> Ali: You watch it again on different days!
>
> Chris: I do it one, then the second day I will do it one, then the third day I will do it one hhhhhhhhhhh (laughing)
>
> Ali: You do it one
>
> Chris: Yes. This is coloured in blue actually. You are doing it [pause] that is the wrong colour.
>
> *Fieldwork Note 1: (25/06/13 W)*

Erica with her mum entered the pre-school room. Erica gave her mum a big cuddle and then went to have her breakfast. Then, this short conversation took place between her and the practitioner:

Sally: what do you feel like doing today Erica?

Erica: I like this [pointing at her bowl]

Sally: yes Erica, but I mean what do feel like doing today in the nursery?

Erica: play cbeebies.

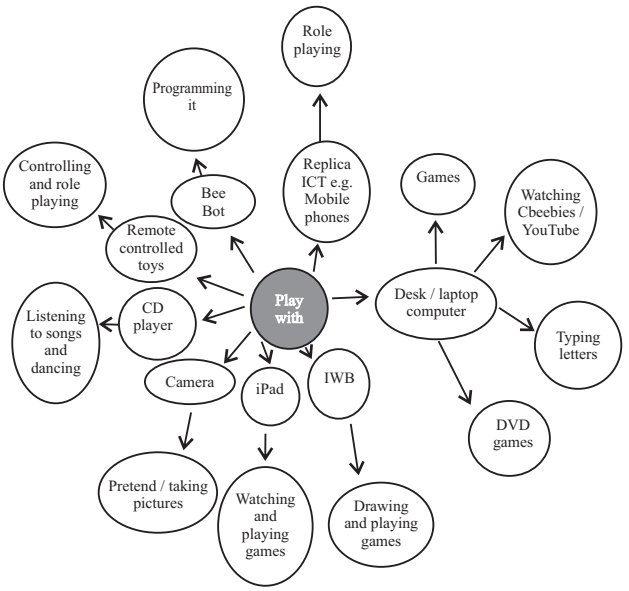
Fieldwork Note 2: (28/04/2014 S)

Cbeebies is a website that presents programs and games specially designed for young children. Both of these conversations occurred naturally. In both cases, the children used the category 'play' to describe what they 'did' at the computer. Chris liked to play by watching The Lingo Show once every day but not 'again and again' on the same day, so that he did not become bored.

The children seemed to be well aware of the distinction between what they did at the computer and what 'grown-ups' used it for. Yang explained that 'play is what we can do on it, we can't do adult stuff, only adults can do reading and work. When we grow up, we'll do homework' (09/05/2013 W). Later, Lydia explained that '[children] can play everything they want to but if they really want to, they can do it' (24/07/2013 W).

VI. THE MEANING OF DIGITAL PLAY FOR CHILDREN

Dora described playing with the computer as 'doing something on the computer' (17/03/2014 S). 'Doing something' with ICT resources, be it dancing, watching, typing and/or pretend typing, drawing on the IWB, playing a game, programming the Bee-Bot, and singing along to a CD, was perceived as play under certain conditions, which are discussed below. In figure 1, a visual summary is provided of the types of tools used by the children and, at the second level, the nature of play observed with each.



Ownership

The children desired to self-lead ICT-based activities. They enthusiastically initiated their 'play' with the available technologies in the three nurseries during their free play time. For instance, Yang, seeking the permission of the practitioner, asked: 'Carol, can I play on the computer?' (10/03/2013 W). As the practitioner was busy making cards for an activity, Yang came, sat next to her, helping her choose colours and pictures to be printed on the cards in preparation for a classroom activity. He, then, started to 'play': he opened a word processor document, and started writing a list of notes that he thought parents should follow when visiting the nursery (see figure 2). [Insert figure 2 near here]

Dear parents list of ipads

Dear parents this notice on these
Premises we would like you to not
Bring your ipads in our dance class
To interrupt the music
Our teacher name is dnese
And some nursery teachers will
Come and 23 minutes
4 teachers will come to class
55 seconds to finish
And you will get a sticker
To the finishing touch and out the
door to go back to green room

What is interesting in this example is that a similar task had just been carried out by a practitioner, Carol, in terms of 'work', but it was described by Yang as 'play'.

From fieldwork observations and participation alongside the children, it was possible to catch the children's ways of perceiving the ICT resources into play as they experienced them in their 'moment-to-moment interactions' in particular contexts (Goodwin & Kyratzis, 2007, p. 283). The children not only intended to 'play' with these resources, but also distinguished between two positions in their play with technology: 'player' (i.e., children who were controlling the equipment) and 'watchers' (Gloria 01/08/2013 W). These are referred to as technological positions, which children tended to draw on in order to control and influence both technology and their peers. All of the children showed a desire to be the player and did not like to be passive watchers. Once in the position of the player, the child tended to defend their play from other children's requests and intrusion. Normally, the watchers or 'interacting members' (Arnott, 2013, p. 106) offered suggestions, made recommendations for certain programs or made demands for a 'turn'. However, these suggestions or demands were often ignored, since the playing child liked to be in control of the play.

Gloria was playing with the Bee-Bot. Molly came and verbally and nonverbally expressed her desire to play:

Molly: it is my turn now!!!

Gloria: [ignoring Molly's request] 1 2 3 4, four squares and then turn that way, you count Molly 1 2 3 4 and I am going to do that [but Molly wanted to take the Bee-Bot] I am doing it Molly!! I am doing it!! Where do you want it

to go? I'll show you [Molly reluctantly referred with her finger at a square] Ok [Molly again tried to grab the Bee-Bot, but Gloria prevented her]

Molly: I'll get Youn, I don't like watching [then she left]

Fieldwork note 3: (16/07/2013 W)

Molly clearly wished to self-lead the play and to actively engage in it. But Gloria sought to evade Molly's requests by giving her the chance to give instructions that would not be performed by her. Hence, Gloria subordinated Molly's position to that of a watcher, whose role was predicated on the terms of the playing child, Gloria.

It is probably the case that children in this study might have regarded ICT resources to be temporarily owned by them, as they positioned themselves as the players. Here, ownership of the resource gave them power and control and hence control of participation in the play by accepting other children's requests or rejecting these and blocking their participation. This is in line with Arnott's study (2013), which showed that children drew on their social status as leaders to dominate or negotiate their goals.

Fun

The children perceived play with ICT resources as 'fun'; 'fun' refers to the experiential aspect of enjoying the play experience (Nabi & Krcmar, 2004). The children felt happiness and excitement while engaging in ICT activities, as demonstrated by clapping their hands, smiling, identifying themselves with characters, etc. In addition, in all their drawings, the children drew themselves smiling, indicating their feelings of enjoyment and interest when playing with ICT resources. Steve (10/11/2013 S) explained through his drawing, shown in figure 3, that he felt happy when playing at the computer and that he preferred to play with his friends.

All of the children seemed intrinsically motivated to engage in ICT-based play activities. Intrinsic motivation in these play activities arose from voluntary engagement, feelings of enjoyment and fun experienced during the play.

Friendship

The children expressed a desire to play or be with their friends in their activities with ICT. However, they tended to defend their ICT-based activity from intruders, be they friends or watchers (e.g. other interested children). The children used some strategies to affirm their leadership over their play with technological resources. Under such circumstances, the children felt tension as a result of a conflict between their wishes and these of other children including friends present in the activity who wanted to play too (i.e., exert some influence on the activity). Conflicts were common, and often led to suspending friendships temporarily or negotiation. Instances of this kind were perceived negatively but probably presented unexpected learning opportunities, putting children's developing social skills to the test. The following episode, which features 'playing' (i.e., dancing and listening to music), reflects a conflict between two friends and shows how Lora used a diplomatic strategy to gain power of social status as the leader of play.

Lora and Alice were playing in the kitchen and then they came to the green table and wanted to listen to a CD. Gloria's CD of children's songs was playing.

Lora: We've never listened to this one before (a CD called 'KIKA HITS' in German)? Shall we listen to it?

Alice: Yes

Lora: How to turn this one on, Hani?

Hani: you need to switch that one

Lora: Ok (removed Gloria's CD, put Lora's CD, KIKA HITS, in the CD player)

Alice: I want to play the one that Gloria wants

Lora: Ok (she put back Gloria's CD, the music started, then they started to dance, and other children joined in)

Gloria: (came back to the activity) This CD is full of scratches, it needs to be wiped (she did that and put her CD back in the CD player. All the children started to dance again. After a while Lora wanted to put on the KIKA HITS CD)

Lora: now I am going to change it Gloria, Okay!

Gloria: no, not yet

Lora: We need to change it to people ok. I am going to stop it now

Gloria: We a music [inaudible]

Alice: No we want to do …. we need to get people a big idea [Lora stopped the CD and wanted the KIKA HITS one. Gloria did not agree and stopped the CD player]

Lora: Gloria if you do not let me play, I will not invite you to my party (then Lora put the CD on).

Gloria: (made an angry voice) No (and stopped the CD).

Lora: If you let me have this, I will be your best friend and I will give you my ball

Gloria: ok, got it

Lora: can we start now? (Then the music started) When the music starts you dance and when it stops you sit down? (She stopped the music.) Shall we start again? (She started the music and stopped it.) You (addressing Gloria) are out? (She started the music) well Chris is out now?

Fieldwork note 4: (31/07/2013 W)

In this episode, Lora and Gloria were dominant leaders with conflicted wishes. Lora managed to negotiate her wishes with Gloria by compromising and bargaining, and hence resumed the role of the leader of the group. However, conflicts more

often ended up in terminating play or suspending friendship. For instance, in a pretend play episode, there was a 'Zoo shop'. Chen was playing with a till in the office area. He wanted to be the cashier. He asked Claudia, a practitioner, to help him get some pretend money so that he could role-play the cashier. He started pressing buttons. Yang came and asked: 'can I play with this one?' 'But I am playing now!!!' Chen replied. 'We are not friends', Yang said, with a frowning face, and then both of them left (05/07/2013 W). Yang here used a different strategy to that of Lora; he tried to dominate the activity using his social power (Arnott, 2013).

The children attributed these conflicts variously. The children wished to play on an equal turn-taking basis, discussed below. They also wished to have some 'peace' while playing, since lots of children stood around, shouted, pushed, touched the equipment, etc. In addition, some children referred to the fact that children needed to wait since 'there is only one mouse' (Arthur 12/01/2014 S). Nonetheless, the children did prefer to be with their friend(s); many of them explained they would feel 'lonely' and 'sad' if they played without their friends.

Fairness

This aspect showed children's moral thinking about their actions in the context of activities with technology. They justified their preferences to self-lead their play the way they liked using rights-based reasoning. Phrases such as: 'He is having a very long turn!' (Chris 02/05/2013 W), 'Not only you, I want to play' (Rich 18/06/2013 W), 'You already have a turn' (Paul 10/01/2014 S), 'It's for all people' (Ken 09/12/2013 S), 'When it's my turn?' (Lora 14/05/2013 W) were common in children's discussions and activities with technology. Hence, while arguments and quarrels, as mentioned in the literature (e.g., Arnott, 2013), were common and might be described as negative, the children's intentions were to play fairly.

Gender

Children sometimes classified the content of their activities with technology as either girly or boyish. Once a child gained access to the play they chose programs that accorded with their gendered identities, without exception in this sample. For instance, girls would choose or ask for programs that contain princesses and housework such as making cupcakes, while boys would like to watch or play games such as Mike the Knight, Power Rangers and Superheroes

VII. DISCUSSION

Nursery-aged children are inquisitive about different aspects of their lives in the different contexts in which they experience events. The opportunity to voice their perceptions provides a rich source of information about their learning, education, play, and other matters to those who are responsible for educational provision for these young children. In this article, evidence was presented as to how nursery-aged children perceived their ICT-based activities as play experiences. In particular, attributes of what the children perceived as play with digital resources are summarised in table 2.

[Table 2 near here.]

The findings suggest that children perceived their ICT experiences in the nursery settings as 'play', conceiving their actions and interactions (such as choosing a program, controlling the mouse, dancing) as 'playing'. The playful experiences were meaningful (Truong & Mahon, 2012), to the children in that they were self-initiated, self-led, and enjoyable; in the process, the children drew on agency, social roles and relationships, moral reasoning, and gender differences, combined with technological positions (Truong and Mahon, 2012; Arnott, 2013). This finding is consistent with that of previous studies which indicated that children are likely to view voluntary, freely chosen activates as play, and teacher-imposed, teacher-led activities as 'work' (e.g., Barnet, 2013; Howard, 2002; Wiltz & Klein, 2001).

The social dimension of digital play appeared in the children's friendship preferences and in their social status roles. The children wanted to be with friends, and they used friendship relations and social power to negotiate goals and control the play. When attempts to negotiate failed, conflicts arose. This finding aligns with research showing that children like to play with friends and that this play often includes conflicts over controlling play objects (e.g. Factor, 2009; Arnott, 2013).

The fairness dimension of digital play appeared in children's preference to play on equal basis and to defend their play rights. This finding shows the prevailing preference of nursery-aged children for fair play and is in agreement with previous research (e.g. Wong, 2010). Wong (2010) found that young children frequently used justice-based moral rules to maintain equality in sharing and to preserve their personal rights in the ownership of play. In the study reported here, the children raised the equality concept in order to express their right to play.

The finding of gender differences in the children's ICT-related preferences is congruent with previous research (e.g., Francis, 2010; Oncu & Unluer, 2012). This research showed that most young children develop awareness of gender differences and expectations early in their lives, and prefer gender-appropriate toys and games.

The children enjoyed a multiplicity of activities with ICT resources, and these activities were motivated by 'fun'. Although feelings of fun depended on many elements, such as the role and position of the child in the activity, the focus here is on children's characterising of digital play as fun, comparable with traditional play.

The children did not regard the computer as a 'toy' as a previous study by Downes (2002) indicated. Rather, the children were well aware of the difference between a 'toy' computer and the real 'adult' computer. Appropriating the computer in their play did not transform it into a toy. It is noteworthy that play is not taken to mean to play games. To view children's behaviours and social interactions as just playing games would not reflect children's meanings. The children perceived their actions in the context of, and their interactions with, digital resources as play regardless of what these resources would normally help them do. Forms of play included watching something desired (such as pirates or Peter Rabbit), writing, creating stories, listening to a preferred song, programming the Bee-Bot and so on (see figure 1).

It has been argued that computers as well as other technological resources are 'a means to an end' (Shields & Behrman, 2000, p. 4). For the children in the study, ICT resources were means to 'play'. Unlike the claims proposed by some historical commentators (e.g. Healy, 1998), the children were far from being passive users or players. They showed a level of digital literacy in that they talked about a wide range of programs and games that went beyond what was available at the nursery. They were also active in shaping their play with technological resources and used their agency to own and lead this play. These findings support those of Arnott (2013), who showed that 'technological affordances may be secondary to children's agendas and the latter is likely to determine how positions emerge' (p. 109). Technological positions were partly determined by affordances as children used their social status roles to shape activities with technology, and used power to dominate their peers and to influence the dynamic of the social processes.

Marsh et al. (2016) developed the taxonomy of digital play to assist Early Years professionals to classify the types of play and learning that occur when children interact with technology. Bird and Edward (2015) also developed the digital play framework that helps early years' professionals to see how children's play with technology moves from exploration to play. Arnott (2013) explored the social construction of technological activities from children's perspectives. Arnott's study showed that children tended to draw on technological positions and social status roles in their attempts to influence and gain control over the technology and their peers. As an extension to this literature, the current study explored the wider picture of children's thinking about ICT activities, including friendship negotiation, ownership preferences, attempts to lead the activity, moral thinking that starts to develop at this period, gender preferences, and feelings of enjoyment. Thus, the study illuminates what constitutes digital play or the characteristics that make it play as children made sense of their activities with digital technologies; the characteristics that children in this study used to define digital play are similar in many respects with characteristics of traditional play (Einarsdottir, 2014).

In the light of this study, the pedagogical challenge is not so much to ask whether technologies are useful or harmful to young children's development. Rather, the challenge for teachers, practitioners, policy-makers and educational professionals lies in ensuring that the introduction of new technology into a nursery setting assists in extending children's play without hindering development. If practitioners and policy-makers 'attempt to view play more from the child's perspective and to be more accepting of play that is sometimes viewed as "inappropriate" in the classroom' (Wisneski & Reifel, 2012, p. 184), they can become the source of guidance, assistance, advice, and support to young children and their parents. Instead of considering technological resources as 'an available option', practitioners might consider developing new pedagogies for incorporating technology as an 'essential activity' (Ljung-Djärf et al., 2005) in which children learn as they play.

The limitation of the research is that the gender aspect of this play was not explored in depth. Future research could explore how gender differences may influence children's friendship relations, and whether girls are more able to negotiate their goals than boys.

This research provides further evidence that young children see using ICT as "play". The implication of this finding is that, rather than dismissing ICT as detrimental to children's development, or passively accepting technology as inevitable, teachers and parents could channel such play into their planning so that children's play with technology is conducive towards their formal learning and development. When early years educators are aware of the 'essence' of digital play, they are better able to support children's learning in this area and to undertake further research about what is learned and what might better be approached without technology.

VIII. CONCLUSION

Using ethnography to carry out 'a broader analysis of situated encounters, experiences and social dynamics' (Arnott, 2013, p. 100) of children's technological activities, this paper contributes a fresh perspective on digital play in the early years. It evidences a need to move from a techno-deterministic view of technology, beyond the view that technology is not appropriate in a play-based environment, to considering how children as active agents, through interaction with technology and peers, drawing on social status roles and technological positions, dynamically construct what they perceive to be play. It shows that digital play has more in common with traditional play than has been previously assumed.

According to Edwards (2013), understanding the intersections of traditional and convergent types of play:

represents an alternative way of thinking about what play looks like in the post-industrial context … a post-industrial conceptualisation of play views the relationship between traditional and convergent play as opportunities for children to create 'webs of meaning' that are personally relevant to their own lives. This in turn provides an entry point for teachers … as … learning can be planned for and mapped in relation to children's emerging cultural needs and interests' (ibid, p. 23).

In this study, some elements of the 'webs of meaning' within the sample have been described. It is hoped that the results help develop an entry point into more effective planning for young children learning with ICT.

By describing digital play through the eyes of children in the natural context of the nursery classroom, this study contributes to bridging the existing gap in early years education between play pedagogies and young children's experiences of digital technologies (Edwards, 2013). In addition, locating technology in the social setting, where children use technology to construct their own meanings and participate in social relationships, enables teachers to make informed decisions regarding the role of technology in fostering children's cultural meaning-making (Edwards, 2013). Hence, this study responds to the 'contemporary situation in which children are participants' (Edwards, 2013, p. 203) by re-contextualising children's play with digital technology from their own perspectives (Marsh, 2014).

By highlighting intersections between traditional play and digital play, this study contributes evidence for the need to rethink context so that the boundaries between 'play-based environment' and 'technology' are less distinct than they were some years ago (Bird & Edwards, 2015; Marsh et al., 2016; Plowman, 2016).

IX. REFERENCES

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