DIGITAL * Childhoods *

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RESEARCH BRIEFING TWO: PLAYING AND LEARNING WITH TECHNOLOGIES

Playing was a central activity in the everyday lives of the 3-and 4-year-olds who took part in our research projects. They played at home, at nursery, went outside to play and were taken to play with friends. When their parents described how the children spent their time they often talked about them as either playing with 'things' or with other people. We will return to what the children played with later but first I want to consider what we mean by playing and how play is related to learning.

What do we mean by play?

There is widespread agreement among those who make decisions about what children should do in their early education settings that 3- and 4-year-olds learn through play and that the best kind of educational experiences are 'play-based'. But this is an area of education that is full of contradictions and tensions. There is very little hard evidence that play leads directly to learning, especially learning particular things. Some researchers have suggested that children gain immediately from play while others argue that the benefits can only be seen later.

Playing is often thought to be behaviour that is spontaneous, has no particular goals and no need for an end product. Yet, despite this, practitioners and parents sometimes encourage play with particular toys or games because they are thought to be educational, and toy manufacturers claim that their product improves children's development of skills such as reading, mathematics or physical dexterity.

'Child's play' is sometimes compared with the work of adults; the former being easy and pleasurable and the latter serious and challenging. On the other hand, play is considered to have an important developmental function. Children all over the world play and this seems to confirm suggestions that play is a biological necessity for development. At the same time other researchers have described the ways in which children's play is shaped by the opportunities and values of the culture in which they are growing up.

Defining play is difficult. There are lists of different types of play, such as games with rules, pretend play, physical play, and of the characteristics associated with play such as being self-motivated, risk free and personally satisfying. Alternatively, play can be defined as anything children do or as the child's work. However, far from considering *any* actions of children as play, Vygotsky, an important child development theorist, argued that only pretend play or 'as if' play (where children imagine scenarios, act out roles and stick to the rules for those roles) is important for their development.

In our studies we have chosen to focus on what children do with their technological toys and the new technologies available to them at home and in their preschool settings. We have not specified a particular range of experiences, actions or interactions as play and have a broad definition of technologies and technological toys and games. Pretending to buy groceries with a simulated bar scanner involves social interaction and imagination. It can be satisfying or frustrating and could be a freely chosen activity that emerged as part of a longer play episode or a response in an adult-directed activity designed to give some 'hands on' experience of calculations with money. Spending time at the computer might be an opportunity to create a fantasy world or experiment with shape and colour in an art programme. It could also mean identifying matching initial letters of words or recognising rhymes in a game intended to support developing reading skills. Our interest has been in what preschool children can do and want to do with technologies, the ways in which these new resources are incorporated into their everyday lives, how they learn to use them and the kinds of cognitive, physical and social activities encouraged by using these resources.

University of Strathclyde
Humanities & Social Sciences

UNIVERSITY OF STIRLING

Technologies and playthings

All of the homes that we visited for our research projects contained large numbers of toys and technologies, regardless of family income. When we surveyed the toys in the homes of the children taking part in our most recent study we found props for pretend play, board games, puzzles and jigsaws, soft toys and dolls, cars, farms, train sets, construction kits like Lego, musical instruments, bicycles, balls, dressing up clothes and much more! Books, resources for art and crafts and educational games designed to support number work and reading were there too. The proportion of the playthings in any individual home that could be categorised as technological ranged from just over 33% for one family to only about 10% for others. In 10 out of the 14 families taking part in that study about three quarters of the toys were traditional ones and one quarter or less had some technological features.

There were differences between the toys that girls and boys owned and in the kind of character toys and accessories they had such as Thomas the Tank Engine or Disney Princess. Girls were more likely to have Barbie dolls and boys Lego. But there was no clear distinction between girls and boys when we looked at the proportion of their toys that were technological. The kind of toys and technologies played with by our target children did not vary according to the socio-economic status of their home either. All of the children identified a favourite traditional toy, nominating a wide range of preferences from jigsaws to bikes, drawing and imaginary play. Most of the children were also able to tell us about a favourite technological toy or game. The range of technology favourites nominated was narrower, with computer games, a Wii and various games consoles being mentioned most often.

Children's play preferences

We found out about the children's perspectives on playing with technologies through some specially designed activities that used techniques that were familiar to 3-5-year-olds, such as indicating choices with smiley and sad faces or stickers. When we asked about the activities, toys and games they liked and disliked we found a preference for physical activities such as swimming, playing in the garden or riding a bike.

'Using the controller can be hard because there are so many buttons it's hard to use them all at once' (Kenneth)

Indoors their favourite sources of entertainment were computer games, television and watching DVDs. The usual reason they gave for not liking a toy or game was that it was boring or 'too hard'. The children described some technologies and particular games and activities in these terms, too. They were put off technological playthings and games when they had difficulty in managing the controls, the activity took too long or they were not able to complete the tasks. Their parents were sometimes surprised by the children's negative comments about technological games or toys as the adults tended to assume that their children were interested and competent users of most forms of technology.

'I'm good at the Bob the Builder game' (Catriona)

We asked the children about the traditional and technological play activities that they thought they were good at and found that they could make judgements about their own competencies. In contrast to the general assumption of adults that the youngsters were good at using technologies the children were clear that they were better able to do some things than others. They thought that they were good at things like drawing, football and swimming and at play with a wide range of technologies. We were surprised by the relatively small number of children who said that they were good at using the computer. We have no way of assessing the accuracy of the children's judgements but our study suggested that the children were discriminating users of technological resources, knowing what they liked and making judgements about what was boring, fun and what they were good at using.

'I die on that one, it's rubbish' (Freddie)

Parents' play expectations

The parents in our studies had clear ideas about why they bought toys for their children and what they expected children to get out of playing with particular things. Some parents occasionally bought toys for their educational value but no one talked about only buying toys that are explicitly designed to help with learning. They were overwhelmingly in favour of the view that there is more to learning than reading, writing and numbers and that playing does not mean missing out on other important aspects of development. However, they were divided over whether children get a head start from playing with technological toys rather than traditional toys. The parents we talked to did not think that learning could be handed over to a computer and argued that parents have an important role as children's educators. They said that there was a time and place for computers and that technology was not the answer for everything. Parents were generally of the opinion that technological toys were less likely than traditional toys to stimulate children's imagination and we found few examples of children using technological toys in their imaginative play. Indeed in one video-recorded play episode 4-year-old Kelly preferred to have her 'technological puppy' switched off when she included it along with her soft toys in a pretend train journey.

'Computers aren't a substitute for humans' (Mrs Simpson)

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Playing to learn, learning to play

We see play as one way in which children learn. However, we acknowledge that they also learn through imitation and modelling, through instruction and from their own experiences. Learning can happen in any context. Indeed learning seems to be a pervasive feature of young children's lives. We are clear that children learn in and out of educational settings. They learn at home, in the playground, with others and sometimes when exploring alone. This widespread nature of learning makes it difficult to define.

In our research we have thought of learning as an internal process which is unseen but made evident by changes in children's level of skill, confidence or knowledge. Children learn how to do things like ride a bike or climb to the top of the slide, they learn to do things better (using cutlery or taking turns for example) and they learn about the world in which they live, (for instance, identifying and categorising animals, knowing about quantity and beginning to read). From our studies of children engaging with technologies and technological toys at home and in their preschool setting we have been able to conclude that these experiences support four types of learning. We are not claiming a direct or exclusive relationship between playing with a particular technology and a specific learning outcome, but that opportunities to use or play with some technologies support children's learning.

The first kind of learning that is supported by playing with technologies is what we have described as *operational learning* – learning how to use the toys and other resources. For instance, in the nursery children learned to use the controls on audio recorders and digital cameras and about some computer functions. At home they learned how to find the television programme they wished to watch or to answer a call on a mobile phone. As they used the technologies the children were involved in a second form of learning - *extending their knowledge and understanding of the world* by finding out, for example, about people, places and the natural world. They practised counting and matching shapes, matched initial sounds, words and pictures and sorted music into soft/loud, slow/fast categories. At preschool and at home children demonstrated their developing knowledge as they succeeded in sequencing and sorting games. Children began to read their own name and the names of family members on file labels on the desktop and learned about topics and questions that fascinated them, whether that was dogs, cars and trucks or volcanoes. As they reviewed digital photographs they learned about family stories and relationships.

A different form of learning is seen in the *development of dispositions to learn*. Children's self-confidence and self-esteem flourished as they became increasingly competent users of technologies and technological toys. Their willingness to persist grew and they and the adults who cared for them noted with pleasure the children's greater independence. Nursery practitioners described children becoming able to print independently or complete tasks on their own and parents talked about their child's growing concentration on and persistence with games on the home computer. The fourth form of learning was more noticeable at home. Children *learned about the role of technology in everyday life* - for communication, work, making purchases and for leisure. For instance, they learned to take part in phone calls, Skype conversations and to share photographs by email or mobile phone with family and friends. The children became able to participate in games like bowling with their families on the Wii and watching DVDs with siblings.

Play, learning and supportive adults

We have suggested above that children's opportunities to play with technologies and technological toys supported their learning but the availability of the toys alone was not sufficient – they also needed the help of adults or more competent children. Our research makes it clear that if children's learning is to be promoted in preschool settings or at home it is essential that they are offered sensitive support. Children need the help of others who can recognise their existing understandings and skills and interact with them in ways that develop new competencies and help them to acquire the tools that will allow them to participate in their society (e.g. literacy and numeracy). Adults can help through modelling or demonstrating, explaining and instructing, monitoring and offering feedback, prompting exploration and asking 'what if' questions. Children also sometimes need help to manage their emotions as they use technologies. Pleasure and self-confidence are enhanced when parents or practitioners offer praise or share in a child's fun. Adults can help with encouragement when frustration threatens to take over, by being alongside when something scary happens in a story on a DVD or by settling difficulties that arise when children with different competencies compete in a game. We call these various ways of providing support *guided interaction*.

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What children learn as they play with technological and traditional toys at home depends on the context of their family. It is influenced by the values of their parents, their beliefs about the benefits of playing with different kinds of resources, the ways in which parents think that learning happens and on their typical style of interaction. One of the mothers in our study was sceptical about the value of technologies as a way to support learning but could see potential in the interactive book we introduced. As with any other new technology the family acquired, she carefully explained how it worked to her daughter before allowing her to begin to use the book. In another family the mother was very enthusiastic about the educational potential of technological toys. She valued exploration and direct experience as the best way to learn and was keen that her son should work things out for himself. For example, Arden was expected to find out how to play on his games console and his mother only helped when he asked or became very frustrated.

And all of these different learning opportunities will be influenced by the child's individual preferences. Two children in our study had access at home to a computer and to a Wii but their very different interests meant that they had different play experiences with these technologies. Robert was motivated by competition and enjoyed both the physical activity and chance to score points and compete against himself and others that the technological games offered. In contrast, Jasmine only played on the Wii occasionally with her mother and brother when they had time for a collaborative family activity.

Where we stand

Technological toys and technologies such as computers and games consoles, televisions, DVD players and the 'real life' technologies that children have access to, such as digital cameras or mobile phones, have extended the range of play possibilities but our studies suggest that they have not replaced traditional toys. We have found that playing with technologies is associated with learning how to use the toy or technological equipment, extending knowledge and understanding of the world, developing persistence, independence and other positive dispositions and knowing how to take part in the social and leisure world of family and friends. However, we see play as only one way to learn. Our studies have demonstrated that play and learning opportunities with technologies are enhanced when children are supported by responsive adults and that the culture of the home in which they are growing up and their individual preferences are important determinants of playing and learning in digital childhoods.

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