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# The Home as a Technological Learning Environment: Children's Early Encounters with Digital Technologies

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## **Abstract**

Today's children are growing up in homes with an ever-growing array of technologies supporting families as they work, play, communicate and learn. How have recent rapid changes to the home as a technological environment influenced what and how preschool children learn? This paper, based on a series of studies of young children's experiences with digital technology at home, identifies key factors – including the structure and layout of the home, family practices, family values and family interactions – which shape the ways in which children: a) learn to use technologies; b) learn about the world via the medium of technologies; c) develop learning dispositions; and d) learn about the role of different technologies in family and community contexts.

## **1. Context**

Over the last decade or longer, the homes of children growing up in the developed world have become increasingly technologized environments in which computers, the internet, cell phones, digitally controlled domestic appliances and entertainment devices, and technological toys all play a major role in family life. While the significance of the 'digital revolution' for the 'information society' has been widely debated, and, more specifically, there have been a number of key studies focusing on the ways in which gaming and internet-based activities have influenced the learning behaviour of school-aged children, the impact of these societal shifts on family life and home activities has received less attention, and we know little about the ways in which young children, growing up in 'hi-tech' homes begin their learning careers in such environments.

## **2. Aims**

This paper presents findings and reflections from a series of studies with young children, aged three to five, focusing on the range of technologies available to children in the home, the kinds of technological activities they undertake, and the learning these facilitate. A key aim of the work has been to explore children's early experiences with technologies so that early years practitioners are better informed about these and able to

build on them as children enter formal education. In addition, given the extent of public debate around the advantages and disadvantages of early engagement with digital technologies, our work seeks to dispel certain myths, providing an evidence-based perspective on the ways in which young children and their families integrate technologies into their everyday lives. (For a detailed account of these studies to date, see Plowman et al., 2010.)

### **3. Theoretical background**

Our work draws on sociocultural theory, particularly Barbara Rogoff's work exploring cultural factors influencing young children's development around the world (cf Rogoff, 2003); writers such as Heath, whose immensely detailed, longitudinal account (1983) of children growing up in a rural area of the south-eastern United States research showed that variation in both the physical and the cultural environment of these communities produced very significant differences in terms of children's existing competences when starting school; and the work of Luis Moll and colleagues investigating ways in which young children gain access to the kinds of knowledge and skills valued by the communities in which they are growing up, developing the concept of 'funds of knowledge' (Moll et al., 1992). From studies such as these we have derived our own theoretical model of the home as a learning environment, to be presented in this paper, incorporating the *structure and layout* of the home, the *routine practices* of the home, the *cultural histories, values and aspirations* of families and the communities in which they live, and *interactions* within the family and with the wider community. All of these elements are linked to each other, and combine to determine both what children learn – what is seen as important or valuable – and how they learn. We seek to understand the place of digital technologies within this broader framework.

### **4. Methods**

Our two completed studies, *Already at a Disadvantage?* (McPake et al., 2004) and *Entering e-Society* (McPake et al., 2007) were based principally on case studies of families with children aged three to five, as is the research on which we are currently engaged, *Young Children Learning through Toys and Technology at Home*. In total, between 2002 and the present, we have worked with 54 families, selected to ensure a balanced distribution of gender of child, family socioeconomic status and location, as well as high and low use of technology in each household. Each case study has involved several rounds of data collection, designed as an iterative process to enable us to respond to emerging issues, such as parents' reminiscences of their own uses of technology since childhood. Multiple visits also give us the opportunity to gain an understanding of family cultures, develop relationships of trust, and track changing patterns of use and attitudes. Two researchers are involved in each family visit: one audio-records interviews and one takes field notes. Facilitated by NVivo, our analyses of the case study data are subject to detailed case-by-case readings of the data: the cases are representative in the sense that they highlight some of the complexities of children's experiences with technology at home but the particular configurations of socioeconomic status, availability of different types of technology, and participants' attitudes and experiences are unique.

Our approach involves the gradual development of a relationship with the children, over a period of several months, to the point where they are comfortable in our presence and interested in what we are doing. We have used a number of visually oriented methods to stimulate conversation, including the use of photographs taken by the children's parents

or by the children themselves, maps of the home environment constructed with stickers, and sorting activities using pictures of technological and non-technological items with which we know they are familiar. These and other methods have enabled children to show us how they use technological items and have allowed us to explore ways in which they engage in shared technological activity with other family members, learning from them and developing their own – and others’ – expertise.

## 5. Findings

In this paper, we focus on what we have learned about the home as a technological learning environment:

### *Structure and layout of the home*

We describe the very wide range of technologies available in the home and the extent to which considerations such as location and technological complexity enable or inhibit young children’s access to them. An important finding is that children do not automatically have access to all the technologies available in the home: parents may hide or forbid children to use expensive, delicate or potentially dangerous items. Conversely, children may have regular access to items that are not located in their own homes but in those of other relatives, neighbors or friends.

### *Routine practices*

We also report on ways in which families’ domestic practices – such as eating, sleeping, work and leisure – incorporate technologies and introduce young children to the various roles which they play in everyday life in the 21<sup>st</sup> century, even when the children themselves are not the principal users. Internet shopping, email, the use of search engines to acquire routine information or to find out more about topics of interest and other practices common among adults or older siblings are all activities with which young children see as ‘normal’ within their families even though they are rarely able to engage in these themselves: in most cases this is not because of technological complexity but because they require developed literacy skills.

### *Cultural histories, values and aspirations of families and communities*

A key finding from our research is that family histories and values, including parents’ notions of a ‘good’ childhood and their own perspectives on the role of technologies now and in the future, are a very powerful influence on the extent to which young children actively engage in technological activity. This has consequences for children’s growing confidence in using different items, their interest in technology more broadly, and for the kinds of knowledge and skills they develop. Our research suggests that family values are a more reliable predictor of early technological competence than family income, a finding which challenges some of the research on ‘digital divides’, particularly as we have evidence that less affluent families typically do not share the ambivalence which some more affluent families feel towards young children’s technological activities. (See McPake et al, 2008; McPake et al., forthcoming; and McPake et al., 2010, for further discussion.)

### *Interactions within the family and the wider community*

For all commentators on the home as a learning environment, the nature and quality of interactions involving young children are a key factor in their learning. Early discussions of this phenomenon focused on interactions between children and parents, or more specifically between children and their mothers (Bronfenbrenner, 1979; Tizard &

Hughes, 1984). More recently, Gregory and colleagues have broadened the field somewhat to look at the role of siblings (Gregory 2001) and of other significant adults such as grandparents (Kenner et al., 2007) or other older children or adults who live in the home or are regular visitors (Long, et al. 2007). In all of these studies, analyses of interactions are the most immediate indicators of what and how children are learning, and how interlocutors shape this learning by paying attention to (or ignoring) issues which children raise, pointing to significant phenomena in the environment, or indeed by setting out overtly to teach something which they feel a child should know. In this paper we present some examples illustrating ways in which parents, siblings and children talk when engaging in a technological activity and what this tells us about the learning process.

### *Technological learning*

Lastly, we focus on what children have learned, as a result of these early home experiences with technology, by the time they are ready to start school. We have identified four types of learning: learning to use technology; learning via the medium of technology; learning dispositions; and learning the role of different technologies in family and community contexts. Of these, the first (learning how to switch equipment on and off, rewind, record, store, retrieve) is perhaps the least significant, though often the most remarked in discussions of young children's technological competences. Discussion of the others shows that understanding the ways in which young children are learning with and about technology has the potential to transform our expectations of what children of this age have the capacity to do. This work is therefore of considerable relevance for early years educators and policy-makers, as well as parents and the general public.

## **6. Significance**

The significance of this paper lies firstly in the theoretical model of the home as a technological learning environment which it proposes; and secondly in the discussion of the implications for young children as they embark on their learning careers before they enter formal education. This is an under-researched area, both in terms of young children as informal learners generally (other than in relation to early literacy and numeracy) and, more specifically, of their experiences with digital technologies, given that much greater prominence has been given, to date, to older children's experiences principally with video games and internet-based activities. Yet the importance of children's earliest encounters with technologies and the influence this is likely to have on their subsequent learning is potentially very great, not only for their individual educational futures but for the economic, societal, cultural and intellectual features of the 21<sup>st</sup> century which they will shape.

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