Tracing the Development of Touchscreen Education: How Young Children’s (0-10 Years) Appropriation of New (Touchscreen) Technologies is Leading Us to Revisit Our Teaching Strategies and Vision of Learning

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ABSTRACT

After a brief introduction pointing up the technological origins of humankind, in the main body of this paper the authors bring three different levels of analysis to bear on 0-10-year-old children’s appropriation of touchscreen technology (in the home, during informal exchanges with peers, and at preschool and primary school). First, they review the most recent literature on the topic, showing that the age of first access to this kind of technology has dropped significantly; this suggests the need to provide a critical education in technology from the early childhood education and preschool stages onwards. Indeed, the data and evidence that is accumulating from home and educational contexts prompts the authors – in the second part of the paper – to revisit Sherry Turkle’s classical three-phase model (informed by the work of Papert and Piaget) of how children encounter and relate to “new” digital technologies. Furthermore, the uses that children make of digital devices and the relative cognitive patterns need to be interpreted in light of the epistemological requirements that have driven both the development of these technologies and changes in the dynamics of how they are appropriated. All these levels of analysis are prerequisite to designing educational models that are truly enhanced by the deployment of touchscreen technology. Finally, in the third section of the paper, the authors outline the key principles of their own proposed model – the Bayesian Classroom – based on the theoretical considerations previously outlined.

KEYWORDS

Bayesian Classroom, Cultural Evolution, Teaching Strategies, Touchscreen Technology

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1. INTRODUCTION

The arguments presented in this paper were jointly developed by the two authors; more specifically, Sections 1.2, 1.3 and References were written by P. M. Ferri; and Sections 1.1, 1.4 and 1.5 by S. Moriggi.

1.1. We are Technological by "Nature"

According to a statement paper by the French Academy of Sciences on the relationship between the various types of screen that have marked key stages in the development of digital technologies and children’s (0-10 years) learning over the past two decades: “As in all other areas of human culture, education remains the most powerful technology that humankind has yet developed for the transmission, acquisition and enhancement of knowledge” (Bach, Houdé, Léna, Tisseron, 2013).

Now such a statement, especially in an era that is increasingly pervaded by devices offering Internet connectivity – and (consequently) new cognitive, communicative and relational practices – supports the hypothesis that there is an ontological leap between the merely instrumental nature of our relationship with technology and the value of any educational (or didactic) model (whatsoever).

To put this another way, on the one hand we have increasingly sophisticated machines, which it makes sense for us to exploit in order to facilitate or speed up our daily tasks; but at a higher level, educational values – in no way undermined by the pressing pace of scientific progress and technological obsolescence – remain intact, a fixed and incorruptible point of reference that can help us to find our way through a world in a constant state of flux.

In any case, this dichotomy may be resolved via a more scientifically informed perception of our relationship with technology of all kinds, including the more basic. If instead of viewing scientific advances as a mere sequence of concepts, definitions, formulas and theorems serving to carry out tasks, we see them as complex and powerful categories of analysis and criticism, we will more inclined to take on board the fact that education is a technology to all intents and purposes – and that vice versa – educational models could never have been developed without reference to the technologies that made them feasible, not to say necessary.

This type of analysis has been conducted, for example, by the Nobel prize-winner for Medicine (1974) Christian de Duve (1917-2013), who – in his Life Evolving: Molecules, Mind and Meaning (2002) – provided a rigorous and clear account of the complex interplay between nature and culture that has marked the history of our species.

The Belgian biochemist noted the growing consensus in the international scientific community that “toolmaking played a key role in the development of the human intellect, by way of an evolutionary to-and-fro between hands and brain” (de Duve,
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