THE ROLE OF OBJECTS AND MATERIALS IN THE EXPLORATIONS OF THE "TOUCH-SCREEN" CHILDREN

Monica Guerra, Franca Zuccoli

Human Sciences for Education Department – University of Milano-Bicocca (ITALY)

Abstract

It is recognized that the contemporary era is marked by the widespread availability of technologies, a source of radical change that is deeply influencing the modes of learning and knowledge-building of the so-called digital natives.

More recently, the children and young people of today have been defined as "the touch-screen generation" due to their constant use of tablets and related applications, which is bringing about further changes in their relationship with culture. This last development in particular seems to have led to a different way of exploring objects and consequently of exploring contents. While we do not wish to pre-empt the results of studies that are currently underway, preliminary observational findings suggest that children's approach to contents is increasingly mediated by contact with touch surfaces, which in turn implies a different use of the sensory skills. This represents a new two-dimensional revolution that adds a new perspective to the existing key and multiple vanishing points of the civilization of image: this novel perspective includes a time dimension that is regulated by touch and is more predictable than the exploration of reality.

These early observations already prompt us to problematize some key issues, in particular the need to provide opportunities for young children to engage directly with objects and materials (Edwards Forman & Gandini 1993) not in opposition to their natural predisposition as members of the touch-screen generation, but to offer them a valuable and complementary mode of exploration and research that can contribute to the development of integrated and complex modes of knowledge-building (Zuccoli, 2010). In this paper, we analyze observations and video-recordings collected in early childhood services, discussing the value in today's context of making unstructured materials available for children's play, with a particular emphasis on those materials defined as "unconventional", including industrial waste products (Guerra & Zuccoli, 2012). The last-mentioned materials are particularly contemporary and therefore suitable for the younger generations, while their undefined nature may help to develop complementary competencies that are less easily drawn out by other means.

Keywords: Innovation, materials, touch screen generation, infant toddler centres, preschool, primary school.

1   A NEW GENERATION

It is recognized that the contemporary era is marked by the widespread availability of technologies, a source of radical change that is deeply influencing the modes of learning and knowledge-building of the so-called digital natives. This is the construct used to define persons born during or subsequently to the diffusion of digital technologies such as Internet, the various types of personal computer, mobile phones, etc., which are functional to the spreading of information/knowledge and to the management of a broad range of activities and processes. Digital natives have therefore encountered these technologies during their very earliest learning experiences, they display mastery of them and deploy them on a daily basis (Prensky, 2001).

The digital native is different to those who have encountered digital technologies later in life, the so-called digital immigrants. These are persons who were born before the spread of the new technologies and are therefore not as proficient in their use. In terms of their approach to digital technology, those who have come late to digital technologies may display one of two very different types of behavior: the first category opts not to use this type of technology at all, either because they perceive it as hostile or because they are unable to cope with the significant level of change that adopting it would require; the second category chooses to use digital technology and own instruments such as state-of-the-art mobile phones/personal computers and broadband Internet connections, as well as being registered on one/more social networks, but only use the more basic functions of the instruments in their possession (e.g., only using their smartphone to make calls and send text messages), either

remaining unaware of or avoiding the more advanced functions offered: to put it another way, they avail of what Paola Cinti has defined as the "shell" while disregarding the "meat" (Cinti, 2012).

Digital immigrants, also referred to as digital settlers or hybrids, fall somewhere in between the natives and the latecomers: they too were born before the advent of digital technologies, adopting them after their early learning experiences and displaying a degree of proficiency that is generally inferior to that shown by digital natives (Prensky, 2001).

More recently, the definition of digital native has been revisited: the current generation of children and adolescents have been defined as "the touch-screen generation" due to their constant use of tablets and related applications. A phenomenon which is bringing about further changes in how younger people, including children, relate to culture, because the development of touch technologies in particular seems to have led to a different way of exploring objects and consequently of exploring contents. While we do not wish to pre-empt the results of studies that are currently underway, preliminary observational findings suggest that children's approach to contents is increasingly mediated by contact with touch surfaces, which in turn implies a different use of the sensory skills. Specifically, the predominantly bidimensional approach that characterizes touch leads users to relate differently to tridimensionality, and this is most evident in relation to digital contents. As may be observed in relation to children's everyday experience, their relationship with screens of every kind appears to be direct and physical, as though they were all touch screens: technological objects – tablets, smart phones and personal computers, but even objects which are not particularly technological – are all lightly touched in the attempt to access their contents, suggesting a mode of knowledge-building that relies on mediated as opposed to direct contact. Touching an object is attributed with the power to make something appear or move or do something, implying that a new type of connection has been formed between the act of simply touching and the expectation that something will happen. This relationship with the touch-screen is an infinitely more powerful version of certain traditional games with univocal responses, for example, those in which pressing a key produced a sound or opened a window (Buckleitner), with the difference that, compared to the old-style structured game, apps offer responses that are ever more diversified and therefore far more appealing, engaging and addictive.

Recent applications developed for tablets or smartphones appear to cater for the potential paths of development of even the youngest children, transposing them from the physical experience that characterized the learning of earlier generations to behind touch-screens targeted at children. Examples include applications that tap into children's natural inclination to build and destroy, now transferred behind the screen; but also the numerous applications that use children's fingers as a substitute for drawing or painting instruments, as well as those that teach reading, writing and counting to extremely young children, often under three years of age.

This represents a new two-dimensional revolution that adds a new perspective to the existing key and multiple vanishing points of the civilization of image: this novel perspective includes a time dimension that is regulated by touch and is more predictable than the exploration of reality. In a certain sense, it could be likened to the perspective revolution that during the Renaissance gave rise to a modified vision of reality, or to a more detailed and defined model of it (Piero della Francesca, De prospectiva pingendi). In that case, the novel interpretation, based on systematic observation of reality, became a new form of representing and codifying complexity, which could then be transferred onto canvas or used for architectural and urban design. In other words, the path that was followed led from the complex, to the interpretable as laid down by precise and specific canons, and then back to the phase of execution. In the current case, in contrast, the bidimensional perspective revolution automatically translates into a revolution of direct experience, bypassing exhaustive exploration of the real and tridimensional world, and in some cases completely substituting immersion in reality.

2   SOME NEW QUESTIONS

As the number of children using the newest technologies increases and their age decreases, research interest is also intensifying, although data on the effects of early usage has not yet become available to us. Nonetheless, we may reasonably formulate two hypotheses. As previously demonstrated by longitudinal research on the effects of exposing children to television, presumably research on the use of tablets will show that they do not exert a "zombie" effect on children's brains (Kirkorian), but in contrast that they foster certain types of learning, on condition that interaction with the screen is not the only stimulus that children are exposed to and that the hours of usage do not exceed a certain limit. On the other hand, we may already observe that the relationship with the tablet entails a sort of

deprivation – perhaps the only kind, along with the relational deprivation that would ensue if the above mentioned conditions were not respected – which we may define as physical, sensory, perceptive but also constructive: "In this sense all the children of today are poor [in terms of stimuli] because they are lacking in material experience, in direct contact with things, often substituted by simulation effects in which the virtual takes the place of the real (…). Yet it is the role of touch [and the other senses] to establish the first, most immediate, immunizing contact with the world, directly informing us of what can burn, sting, cut, what can be good or bad for us (…). Although tactile experience is crucial to safety, in everyday life, (…), the messages sent to us by our sense of touch are often overlooked" (Vegetti Finzi, 2006).

Such early observations and reflections already prompt us to problematize some key issues, in particular the need to provide opportunities for young children to engage directly with objects and materials: not in opposition to their natural predisposition as members of the touch-screen generation, but to offer them a valuable and complementary mode of exploration and research that can contribute to the development of integrated and complex modes of knowledge-building. In this paper, we analyze observations and video-recordings collected in early childhood services, discussing the value in today's context of making unstructured materials available for children's play, with a particular emphasis on those materials defined as "unconventional", including industrial waste products. The last-mentioned materials are particularly contemporary and therefore suitable for the younger generations, while their undefined nature may help to develop complementary competencies that are less easily drawn out by other means: there should be no censorship or negative definition of the new possibilities offered by these materials, which are guaranteed to be successful in terms of the activities and experience that they prompt children to independently engaged in, but on the contrary integration and stimulation of these actions alongside others, intentionally designed by the educators, as a means of bringing the children into contact with complex reality, of immersing them in an experimentation that involves the body with all of its rich potential. The aim is to identify and design learning paths specifically focused on the materials, with a key emphasis on experiential activities. The specific choice of material is therefore a key element of the learning path, along with the way in which it is presented and how to stimulate the defined actions on the part of the children, while paying due attention to the dimensions of social interaction and sharing, often a marginal aspect of the touch-screen experience.

In the first place, reflection on the figure of the educator/teacher is in order, in relation to the categories of digital experience and usage outlined above, in order to grasp the changes that have been wrought in the traditional top-down relationship in which the adult was the holder of knowledge who supported the learning child by offering knowledge and instruments in which he or she was expert and the child inexpert. Inevitably, educators and teachers are often amongst those defined as digital latecomers or, in the best-case scenario, digital immigrants. This has implications regarding their level of knowledge and usage of the new technologies. One of the associated risks is that teachers may share a general, often generic, mistrust – or indifference – towards technological instruments, due to ignorance, but also prejudice, so that instead of closely observing the children's explorations, curious to discover how knowledge-building experiences are being changed in early childhood contexts in particular, they stay as far away from the technologies as they can, treating them as a distant and incomprehensible culture to be opposed at all costs. In these cases, the entire gamut of technological instruments is generically viewed as a threat to education, as an offering to be rejected out of hand, as something that will inevitably have negative consequences. The teachers may even advise the children and their parents to avoid this type of experience and experimentation. This in turn may lead to a dissociation on the part of the children between the desire to experiment and play with these undeniably attractive instruments and a moral vision of them as a waste of time compared to more serious activities. It follows that the children will therefore be prevented from availing of the full potential offered by these instruments and left alone to carry out their explorations.

A second consequence is that the education of the touch-screen generation is in the hands of generations who are far from being touch-screen – and which are not even adequately proficient in the digital technologies – preventing them on the one hand from recognizing the potential educational applications of the new technologies and on the other from making knowledgeable and appropriate use of them for educational and learning purposes. The perspective underpinning this paper is that of a complementary and enquiring approach, within which the new developments which are gaining ground and invading educational space may become an opportunity to revisit one's own educational and teaching methods, offerings and choices.

3   OPPORTUNITIES FOR EXPLORATION

The current study followed in this line of enquiry, exploring the potential for supplementing the opportunities for exploration available to children, by presenting them with three-dimensional materials (Caggio, 2009), from the categories of finished objects (Anolli & Mantovani ,1981), industrial waste and unstructured materials (Gandini & Kaminsky, 2003; Gandini, 2005; Kelly & Lukaart, 2005; Eckhoff & Spearman, 2009). The underlying hypothesis was that by providing enhanced three-dimensional opportunities, it would be possible to counterbalance in an enriching and positive manner (not oppositional), the inevitable increase in children's visual and bidimensional experience. The hands used in touch-screen technologies lend themselves to movements that are different to those of grasping and building, and more akin to the bidimensionality of touching or stroking. Trying out actions of construction and balance, which bring to the foreground the material nature of certain elements, and demand the involvement of the entire body and not just of selected parts, allow children to experience a multiplicity of diverse possibilities.

Our analysis of the observation protocols and video-recorded materials collected during training-research projects conducted in a range of childhood services for children in the age groups 0 to 3 and 3 to 6 years in Northern Italy over the past four years, clearly shows that more unstructured materials engage children in play for markedly longer periods of time: on several occasions, we found children between 1 and 3 years of age to engage in independent exploration of such materials for over 30 minutes, a time that was greatly superior to that spent playing with more structured materials. This difference appears to be almost certainly attributable to the complexity of the unstructured materials, whose undefined nature makes them very adaptable and versatile for children's play, but also to their polyfunctionality and material nature, which allow different explorations to those afforded by touch. We may therefore hypothesize that it is important for very young children to have the opportunity to engage in complex three-dimensional exploration, and therefore to have access, amongst other materials, to unstructured materials with strong sensory, material and constructive impact.

These initial observations led us to ask about the current role of materials in the school system. We therefore conducted a preliminary survey of the situation in the schools of the Lombardy region. To this end, in May 2012 we administered a questionnaire to a sample of 102 undergraduate students on the third year of the Degree Program in Primary Teaching at Milano-Bicocca university in relation to the materials present in the Lombardy early childhood services, preschools and primary schools that they had observed in the course of their teaching practice or their work as young educators. In answer to the question: On the basis of your observations, were materials considered important in the schools where you carried out your teaching practice? 61% of respondents replied yes, and 39 % no. The second question asked whether materials were considered important by the children, with 92% replying affirmatively and 8% negatively. Finally, to the question: In your opinion, were materials considered important by the teachers and educators, 67% replied yes and 33% no.

In order to obtain more detailed information in relation to unconventional materials, a second questionnaire was designed to survey their use in Lombardy schools. This instrument was completed by 42 students, in June 2012. In answer to the question: On the basis of your observations, were unconventional materials considered important in the schools where you carried out your teaching practice? only 38% replied affirmatively, with 62% replying negatively. In answer to the question: In your own project work conducted in schools have you made use of unconventional materials? 55% said that they had and 45% that they had not.

4   SOME CONCLUSIONS

Taken together, the observational data and the results of the survey suggest that the stimuli provided by educators and teachers can be a valuable means of developing an aspect that might otherwise be undervalued: that of manual ability and sensoriality, with their implications for cognitive learning.

It also seems clear from our four years' of observational data – drawn from 30 training research projects conducted by undergraduate students as the fieldwork for their theses – that children from infant-toddler center through preschool and primary school, have a strong need to experience and manipulate, devoting long periods of time and intense concentration to this type of play. The time devoted, the conversations and the type of play engaged in, which may be enriched by the ideas of others, are all indicators of this need, which has not diminished over time despite the advent and contribution of new technologies, but on the contrary has become even more developed.

This paper does not put forward definitive conclusions, but poses questions about the possibility of enhancing the use of materials, particularly of the unstructured kind, within childhood services and schools, in a way that is complementary to and if possible – a hypothesis to be explored in future research – integrated into existing modes of exploration, so as to help children to move, through their exploration and reflection, from the bidimensional plane of technological objects to the tridimensional and holistic plane of real objects.

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