

UNCONVENTIONAL MATERIALS FROM THE INFANT TODDLER CENTER THROUGH SCHOOL

Monica Guerra, Franca Zuccoli

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

Abstract

The educational use of unconventional materials – understood as highly informal and undefined materials that have not been designed for didactic purposes and which as yet are not widely used in schools (Guerra, Zuccoli, 2012; Guerra, 2013) – is a theme that has been attracting increasing interest and targeted research initiatives at different levels of schooling. Indeed such materials – given that they are inexpensive, readily available and easily sourced, may be used flexibly and foster creative and divergent experience – represent a potentially valuable resource for educational services and schools seeking new and stimulating ways to interact with their broader context.

This paper presents the outcomes of qualitative research conducted at infant toddler centers, preschools and primary schools, outlining both the transversal usefulness and meaning of unconventional materials for children in general, and the specific ways in which children relate to them at different ages.

Keywords: Innovation, materials, infant toddler center, preschool, primary school, research projects.

1 UNCONVENTIONAL MATERIALS AT SCHOOL

The educational use of unconventional materials – understood as highly informal and undefined materials that have not been designed for didactic purposes and which as yet are not widely used in schools (Guerra, Zuccoli, 2012; Guerra, 2013) – is a theme that has been attracting increasing interest and targeted research initiatives at different levels of schooling (Bagnacani, Giacomini, 2004; Goldschmied, Jackson, 1994; Gordon-Smith, 2010; Grindley, 2010; Kelly, Lukaart, 2005). Indeed such materials – given that they are inexpensive, readily available and easily sourced, may be used flexibly and foster creative and divergent experience – represent a potentially valuable resource for educational services and schools seeking new and stimulating ways to interact with their broader context.

This paper presents the outcomes of qualitative research conducted at infant toddler centers, preschools and primary schools, outlining both the transversal usefulness and meaning of unconventional materials for children in general, and the specific ways in which children relate to them at different ages.

Objects and materials have always been viewed as necessary resources for teaching at every level of schooling. From the most ancient times, a host of thinkers, pedagogists and teachers (Froebel, 1993; Rousseau, 1989; Agazzi, 1938, 1950a, 1950b; Montessori, 1969; Pizzigoni, 1971; Freinet 1973, 2002) have emphasized the added value, at times primigenial in nature, of using material and familiar objects within concrete educational programmes linked to everyday life. The idea that such thinkers have promoted is that education should not be limited to exclusively abstract knowledge, drawn from the words spoken by the teacher or written in books, but should also facilitate new experiences in which children and adolescents can and should directly engage in action while the objects encountered become the cultural mediators of the educational activities proposed. Thus objects and materials have been, and are currently, thought to play a vital role in the education of young children, particularly those aged between 0 and 5/6 years. The lack of a codified language or a written form of communication in the early years virtually imposes the choice of alternative means of communicating, which become relegated to a more minor role as the students grow older. From six years onwards, schools place increasing emphasis on formal and disciplinary learning, which is increasingly abstract and categorizes and simplifies the complexity of reality, intentionally differentiating and cutting off education from other social and everyday contexts. In relation to this aspect, contemporary authors from different fields of knowledge (Edwards, Forman, & Gandini, L., 1993; Hawkins, 1979; Gandini, 2005) along with empirical data from a large body of research (OcsePisa, 2000) suggest that such a level of abstraction does not foster learning in terms of the acquisition of skills, or in terms of a

spreading of shared and useful knowledge from real life to school contexts and vice versa that would overcome the divide between education and everyday existence.

Within this line of educational enquiry, which has gradually come to view as crucial the concrete and manipulative aspects of learning, an area that is receiving increasing attention is the use of unconventional materials in the various childhood services and levels of schooling. As early as the 1970s and '80s, scholars had begun to draw a distinction between structured (Anolli, Mantovani, 1981) and unstructured materials. For these authors, structured materials were: "in operative terms, play material the elements of which are linked to one another via a well-defined network of relations. This means that the elements making up a single type of material (e.g. wooden blocks, bingo cards, sticks and so on) are related to one another in terms of similarity or difference or order or symmetry on the basis of certain characteristic variables (such as shape, colour, size etc..)" (Anolli, Mantovani, p. 17). The definition of unstructured material developed over time, thanks to the contributions of other authors (Bondioli, 1996; Braga, 2009; Caggio, 2009; Galardini, Giovannini, Mayer, Musatti, 1995, Staccioli, 1998), coming to be understood in recent years (Gordon-Smith, 2010; Grindley, 2010; Guerra, 2013; Kelly, Lukaart, 2005; Pramling Samuelsson, Kaga, 2008; Zuccoli, 2010), as a material that is not intended for just one mode of usage, planned a priori by the adult who designed it, but which provides the opportunity to combine different strategies suggested by a more creative and divergent way of thinking. This same opportunity is also supplied by other kinds of materials, amongst which we may highlight used materials, that is to say, materials that in relation to their original purpose have reached the end of their life cycle. A further category that may also be defined as open materials are industrial waste materials (Guerra, Zuccoli, 2012; Guerra, 2013), that is to say, materials that are generated as surplus at the end of a production process, as a result of production errors or as remnants of other products; key characteristics of these materials include the fact that they are new but yet not intended for use, and the fact that they are partial and incomplete.

Such materials, whose potential for stimulating action and reflection in children from the infant-toddler center to preschool and primary school we set out to explore here, may also be described as unusual and unconventional. The last-mentioned term is used to refer to materials not originally designed for educational use at school or in extra-curricular contexts, and which are highly informal and undefined. Given that these materials have not been created with an educational purpose in mind, they are unusual and unconventional in the school context, firstly because they are still rarely used in schools – although their usage is on the increase –, but also and consequently because their educational potential has not yet been fully explored or recognized. The fact that their use is difficult to control, with the issues that this raises for teacher, can make them unwelcome guests at school, or mean that they are only used on a once-off or random basis, without being adequately thematized or analyzed in their own right (Guerra, 2013). On the basis of this brief introductory definition which is most certainly not exhaustive, we now analyze some ways in which these materials have been deployed and thematized in schools, specifically in preschools and primary schools.

A preliminary survey of the situation in schools was required in order to identify the best means of introducing and researching unconventional materials. Specifically we set out to explore what type of materials are normally to be found in primary and preschools: to this end we administered a questionnaire, made up of both open and closed questions, to 102 undergraduate students on the Degree Program in Primary Teaching at Milano-Bicocca university during the academic year 2011-2012. Before discussing the results, it is important to point out that these students are training to become teachers at primary and preschools in the Lombardy region. The degree is a recognized qualification for the teaching profession in Italy, and throughout the four-year program students are required to carry out substantial periods of teaching practice – which is observational but mainly active in nature – in schools in Lombardy – totaling more than 250 hours over the four years. The university requires these students to conduct this observation and teaching practice in a different school every year, so that they can build up a rich view of the current school situation. Given that over 100 students took part in our survey, it is plausible to assume that between them they had experience of at least 300 different schools. It follows that the data provided by our sample is very rich in terms of providing insight into the situation across a broad variety of schools from the privileged perspective of observers who spent many hours working in these institutions as opposed to a few days researching a predefined situation. The first question asked the respondents whether, on the basis of their observations, materials were considered important in the schools in which they had done their teaching practice. Sixty-one percent replied yes, and 39 % no, going on to specify – in answer to an open question – what had led them to reach this conclusion, and speaking in many cases of the great care taken with the setting up and preparation of spaces, and therefore of highly focused adult intervention. The second question asked whether materials were considered important by the children,

with 92% replying affirmatively and 8% negatively. Those who replied affirmatively were asked if they had observed this in preschools (yes for 53%), in primary schools (yes for 29%), or infant-toddler centers (yes for 18%) (in relation to the levels of schooling they had experience of); and specifically whether teachers and educators considered materials to be important, with 67% replying yes and 33% no, and which teachers, in their view, devoted the greatest effort to the theme of materials, among: primary 12%, preschool 84%, infant-toddler 4%. A further open question asked what had enabled them to draw this conclusion: many specific examples were provided of the preparation and fitting out of spaces in classrooms or other areas of the school.

At this point respondents were asked to indicate how this attention to materials was concretely applied, in relation to two closed and one open option: specifically, whether in the context of learning paths or in the context of the layout and fitting out of learning spaces or in some other context to be specified. Each of the closed options was rated on a three-point scale: a lot, somewhat, not very much. For learning paths, the breakdown of responses was as follows: a lot 38%, somewhat 51%, not very much 11%. For the layout and fitting out of spaces: a lot 35%, somewhat 50%, not very much 15%.

One of the final questions asked whether respondents had observed activities related to materials being conducted in the schools where they had done their teaching practice: in this case 66% replied affirmatively, and 34% negatively. Of the affirmative replies, 58% reported having observed this in preschools, but only 37% in primary schools and 5% in infant-toddler centers. This overview of the current school situation shows us that, despite many theoretical and legislative calls (National Guidelines, 2007; 2012) for the use of concrete materials at all levels of schooling, at the everyday operational level educational practice has remained similar to several decades ago, with objects and materials playing a more important role in preschools, but becoming increasingly marginal as children grow older, in line with the idea that schooling should be focused on abstract knowledge that is highly segmented and poorly grounded in reality.

A second questionnaire, again comprising both open and closed questions, was next completed only by those students who were about to prepare undergraduate theses specifically on the theme of the use of materials, either in art or in more general education, many of whom had already conducted significant projects with materials as part of their teaching practice or work. The number of students in this sample was therefore lower than that of a full class group, standing at 42. For this reason, the questions regarding objects and materials were more tightly focused, asking the informants to provide specific examples of both conventional and unusual materials encountered at school (both preschool and primary). The first items once more concerned the use of conventional and unusual materials in the schools respondents were familiar with. With regard to whether the schools they worked in or had done teaching practice in considered conventional materials to be important, 93% replied yes, and only 7% no. The next question asked whether unusual or unconventional materials were considered important in these schools, yielding a lower level of affirmative (38%) and a higher level of negative (62%) replies. Both of these items were followed by an open question asking respondents to provide specific examples of what they meant by each type of material. The third and final section of the questionnaire regarded the work that the students themselves had already conducted in previous years or were currently conducting in schools: the respondents were asked whether they had made use of conventional materials in their own teaching work. In this case, 83% replied yes, and 17% no. Again examples were requested. Finally, when asked about their own use of unconventional materials, the proportion of respondents that reported using them went down to 55%, with 45% stating that they had not used them.

From these quick surveys, it emerged that in schools in general, as in the trainee teachers' own work although based on state-of-the-art research in education (Eckhoff, Spearman, 2009; Ferrari, Giacomini, 2004; Gandini, Kaminsky, 2003), ongoing activity based on the material aspect of things and experience and experimentation as a constant aid to classroom teaching, have to date failed to take hold; on the contrary, experience is viewed as a supplementary tool as well as the exclusive prerogative of concrete materials, and is more strongly associated with preschool than with primary school education. This was also reflected in the examples of conventional and unconventional materials provided by the student teachers, who often considered paintbrushes and colors to be materials, while classifying as unusual: plastic bottles, straws, buttons, fabric and other elements that have long been presented in schools as part of the broader category of waste or materials destined for reuse or recycling.

2 INTENTIONAL ACTIONS WITH UNUSUAL MATERIALS

In this second part of the paper, we discuss why it is important to draw on materials other than those normally to be found in schools (although even conventional materials are not yet used to a sufficient degree, as we have seen). These alternative materials may take the form of teaching aids, created by publishing houses, and informed by the thinking of various educationalists when not actually designed by them (Freinet, 1973, 2002; Froebel, 1993; Gattengo, 1965; Montessori, 1969), or of objects drawn from children's everyday domestic context.

We therefore continue our analysis of such materials, which we earlier provided an initial sketchy definition of. We begin by making the proviso that we do not propose using exclusively unconventional materials in the classroom, but adopting them as a means of enriching the current educational offering, as a resource that has already been partially explored but needs to be further developed and availed of.

The first factor underpinning the value of unconventional materials is that they are materials of the contemporary era, born of our own times, and which therefore speak to our contemporary awareness and act powerfully on our imaginary.

A further characteristic concerns these materials' potential to enhance sustainability, both economic and environmental (Guerra, 2013). In the first place they are available at almost zero cost in terms of purchase price, and they intrinsically contribute to children's environmental education because of themselves they encourage children to have respect for objects and to make ethical use of them. They are also strongly local materials because they have a specific connection with the local area, and therefore with the context in which the children live and in which their schools are located. This induces a sense of closeness while also endowing the materials with a recognizable cultural identity.

In terms of functionality, these materials may also be defined as post-functional, in the case of used materials, or as functional in the case of industrial waste, with both types of material becoming polyfunctional – albeit to different extents – in the hands of those who encounter, make their own of, and reinvent them. They are thus highly adaptable to children's thinking and actions. This flexibility is both physical – insofar as they invite the construction of new shapes and structures – and semantic – insofar as they lend themselves particularly well to taking on the multiple and diverse meanings that children assign to them in the course of their explorations (Guerra, 2013).

By placing both adults and children in a similar condition of "inexperience" (Guerra, 2013), these materials often allow teachers to experience "educational shock". Given that their prior experience of unconventional materials is often as limited as that of the children, insofar as they have not previously had the opportunity to experiment with or build up reference frameworks regarding them, like the children they approach them from an exploratory perspective. This puts the teacher's role to the test: the more unstructured the materials, the more the adult needs to stand back and observe what happens as a result of the activities stimulated by the context.

As part of the experiential research of a large number of students, who have already begun even concluded their theses, as well as training courses in childhood educational services such as infant-toddler centers and preschools, or workshops we ourselves have conducted with undergraduate students, preschool and primary school children, a significant body of conversations have been audio-recorded and documented, and engagement with unconventional materials video-recorded. From this corpus of data, which we are currently analyzing with a view to identifying specific features of how these materials are used and explored, we have drawn some preliminary classifications which have been a helpful guide to us from the outset.

The first categorization regards the actions stimulated by the materials (basic exploration in the analytical phase, the search for a movement naturally elicited by a given type of material, the search for a complex movement, congruent or incongruent combinations of different materials): these actions clearly denote intentional or symbolic thought, by virtue of which the materials become something else, either a planned individual construction or a substitute for some other object.

The second categorization concerns children's observation of their classmates' actions: At times the child is almost wholly absorbed in its own work, paying relatively little attention to what the others are doing; in other cases, the child seems unable to immediately embark on an exploration of its own, but having picked up a material, as though in any case to ensure its own personal space in the group activity, initially observes the others, only subsequently beginning to work autonomously on the basis of its preliminary observations.

The third categorization relates to post hoc conversations. We refer here to discussions initiated by the educator after the children have had the opportunity to experiment with the new materials: by means of stimulus questions and prompts, the adult attempts to draw the children's attention to particularly meaningful points of their explorations and get them to reflect on them with a view to fostering new trains of thought and discovery.

The fourth categorization which follows on the third, regards the questions asked by the adult. The educator's words enhance the children's experimentation as a function of specific characteristics including the timing of the question, the adult's way of putting it and even the type of question.

3 A KIND OF CONCLUSION

Finally, we wish to report on experiential research conducted at a number of infant-toddler centers in the city of Milan: specifically in the context of a training course attended by the entire team of educators from two centers, and individual educators from other centers around the city. The course was not designed to provide training alone, but was based on training-action-research. To this end the educators were invited to take part in experimentation with unconventional materials. The first phase was conducted with the educators themselves, who were asked to record the objects used on a daily basis by the children (records were both written and photographic and were shared with the educators from the other centers). The aim of this preliminary survey was to identify the objectives of the various instruments and materials currently in use at the centers, as well as to observe exactly how children used them. The next step involved the preparation of settings featuring unconventional materials, first for adults and then for children. From the video-recordings subsequently shared among the whole educator group, it was clear that these materials had been highly significant for the children exposed to them: specifically, the toddlers spent longer playing with them in order to discover their multiple potential, using their entire bodies for this purpose, and engaging in visual, tactile or oral exchanges with their peers.

Indeed the difference in the way children at infant-toddler centers approached unconventional materials, compared to preschool and primary school children as observed in the earlier-cited studies, appeared to lie in the involvement of the entire body – observed in virtually all of the experiential research projects conducted; in the need for initial guidance from an adult, before going on to engage with the materials independently; in the attentive visual observation that accompanied the children's actions; in an initial absence of verbalization, apart from rhythmic sounds, or isolated words or sentences; in the fact that children's initial experimentation and play was individual, and only subsequently shared.

The training research, designed to offer materials that could enhance the educational opportunities afforded to children, led the educators over the course of the year to decide to modify the educational space itself, making significant changes to various areas within the centers. This leads us to hypothesize that the introduction of novel elements, in this case unconventional materials, which prompt new educational activities, plus observation of their potential, the use made of them by the children and their impact on the thinking of the educators, ultimately leads to a rethinking of the entire educational service being provided, in terms of spaces, timing and actions that have often been standardized for many years, resulting in key changes regarding materials (not only unconventional), their presentation and use.

REFERENCES

- [1] Agazzi, R. (1950a). *Guida per le educatrici dell'infanzia*. Brescia: La Scuola Editrice.
- [2] Agazzi, R. (1950b). *La lingua parlata: esercizi pratici ad uso della scuola di grado preparatorio e delle prime classi elementari*. Brescia: La Scuola Editrice.
- [3] Agazzi, R. (1938). *Come intendo il museo didattico nell'educazione della infanzia e della fanciullezza*. Brescia: La Scuola editrice.
- [4] Anolli, L., & Mantovani S. (Eds.) (1981). *Giochi finalizzati e materiale strutturato*. Milano: Franco Angeli.
- [5] Bagnacani, S., & Giacomini, E. (2004, November). "La rete dei Remida". *Bambini*, Azzano San Paolo (Bg): Edizioni Junior, 28-33.
- [6] Bondioli, A. (1996). *Gioco e educazione*. Milano: Franco Angeli.

- [7] Braga, P. (Ed.) (2009). *Gioco, cultura e formazione. Temi e problemi di pedagogia dell'infanzia*. Azzano San Paolo (Bg): Edizioni Junior.
- [8] Caggio, F., (2009). "Coltivare sensibilità. Cosa dare fra le mani a un bambino?". In P. Braga (Ed.), *Gioco, cultura e formazione. Temi e problemi di pedagogia dell'infanzia*, Azzano San Paolo (Bg): Edizioni Junior, 117-160.
- [9] Eckhoff, A., & Spearman, M. (2009). Rethink, Reimagine, Reinvent: The Reggio Emilia Approach to Incorporating Reclaimed Materials in Children's Artworks. *Art Education*, 62 (2), 10-16.
- [10] Edwards, C., Forman, G., & Gandini, L. (Eds.) (1993). *The hundred languages of children: The Reggio Emilia approach to early childhood education*. Norwood, NJ: Ablex Publishing.
- [11] Ferrari, A., & Giacomini, E. (Eds.) (2004). *REMIDA day. Muta...menti*, Reggio Emilia: Reggio Children.
- [12] Freinet, C. (1949). *Nascita di una pedagogia popolare*. Trad. it. Roma: Editori Riuniti, 1973.
- [13] Freinet, C. (2002) (Eynard, R., Ed.). *La scuola del fare*, Azzano San Paolo (Bg): Edizioni Junior.
- [14] Fröbel, F. (1826). *L'educazione dell'uomo*. Trad. it. Firenze: La Nuova Italia, 1993.
- [15] Galardini, A. L., Giovannini, D., Mayer, S., & Musatti, T. (Eds) (1995, june). Di fronte agli oggetti. I primi passi dei bambini nella sperimentazione scientifica, *Bambini-dossier*, XI, 6, 1-32.
- [16] Gandini, L. (2005). From the beginning of the *atelier* to materials as languages: Conversations with Reggio Emilia. In L. Gandini, L. Hill, L. Cadwell, & C. Schwall (Eds.), *In the spirit of the studio: Learning from the atelier of Reggio Emilia*. New York: Teachers College Press, 6-15.
- [17] Gandini, L., & Kaminsky, I. (2003). Remida, the creative recycling center in Reggio Emilia: An interview with Elena Giacomini, Graziella Brighenli, Arturo Bertoldi and Alba Ferrari. *Innovations in Early Education*. 12(3), 1-13.
- [18] Gattengo, C. (1965). *Il material per l'insegnamento della matematica*. Trad. it. Firenze: La Nuova Italia.
- [19] Goldschmied, E., & Jackson, S. (1994). *People under three*. London: Routledge.
- [20] Gordon-Smith, P., (2010, March). All about... Learning with recycled materials. *Nursery world*, 4, 18-23.
- [21] Grindley, L. (2010, September). The Midas Touch. *Nursery world*, 2, 16-17.
- [22] Guerra, M. (2013). *Unconventional materials at school: teaching experiences and educational potential*. RELAdEI - Revista Latinoamericana de Educación Infantil, vol. 2, pp. 105 -120.
- [23] Guerra, M., & Zuccoli, F. (2012). Finished and unfinished objects: supporting children's creativity through materials. *Procedia - Social and Behavioral Sciences*, 51, 721-727.
- [24] Hawkins, D. (1974), *Imparare a vedere. Saggi sull'apprendimento e sulla natura umana*. Torino : Loescher.
- [25] Kelly, D., & Lukaart., S. (2005). The hive project: Building community and supporting environmental awareness through recycled materials. *Innovations in Early Education*, 12, (3), 14-18.
- [26] Montessori, M. (1950). *La scoperta del bambino*. Trad. It. Milano: Garzanti, 1969.
- [27] Pizzigoni, G. (1971). *Le mie lezioni ai Maestri della Scuole Elementari d'Italia*. Brescia: La Scuola Editrice.
- [28] Pramling Samuelsson, I., & Kaga, Y. (Eds.) (2008), *The contribution of early childhood education to a sustainable society*. Paris: Unesco.
- [29] Rousseau, J.J. (1762). Emilio o dell'educazione. In *Opere*, trad. It. Roma: Armando, 1989.
- [30] Staccioli, G. (1998). *Il gioco e il giocare*. Roma: Carocci.
- [31] Zuccoli, F. (2010). *Dalle tasche dei bambini... Gli oggetti, le storie e la didattica*, Parma: Edizioni Junior Spaggiari.