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Finished and unfinished objects: supporting children's creativity through materials

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Abstract

Experimenting with materials is something that all children do both at preschool and primary school. Working with materials at school is even more relevant in evaluating what has been produced and go beyond this inescapable frontier, already crossed by art, even in education. This paper presents the first results of an exploratory survey that investigated the meaning and effect of working with materials at schools, based on two parallel and complementary processes: finished and unfinished objects. This survey confirmed that working with different types of materials makes it possible for children to develop their creativity through different but just as important pathways.

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1. Introduction

Objects and materials have been part of the educational philosophy of numerous thinkers, considered a fundamental aspect in active and proactive teaching, where the construction of knowledge becomes an element that is in turn part of the more general development of knowledge. Starting from reality, this process is divided into actions, observations, questions and reflections. Some initial reflections can help us to understand the pedagogical meaning of this proposal which does not have a single direction, but offers the chance to explore diverse educational dimensions. Within didactics, concrete objects and materials are multi-faceted and multi-dimensional aspects of reality, sort of holograms of the world surrounding us. This brief and partial survey is useful for understanding the value of the proposed actions and their history in past centuries. The first reference is found in Comenius, who underlined the necessity to start from things, objects of the intellect and of discourse, before using words (Comenius, 1993). Locke underlined how contact with objects and the appreciable world were the basis of most of our ideas (Locke, 1690), while de Condillac stressed how touch was a fundamental medium for any form of knowing (Condillac, after 1930). Rousseau was to develop in detail how, from infancy, direct experience and teaching-learning were linked. In the second book dedicated to the development of children from 3 to 12 years old, he explained: “Since everything that penetrates human intellect comes through the senses, the first human reason is the reason of the senses; this is the basis of intellectual reason: our first philosophy teachers are feet, hands, eyes. By

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substituting all this with books, we teach not to reason but to make use of others' reasoning, to believe and not to ever know anything" (Rousseau, 1989, pp. 200-201).

In considering the value of dealing with objects and materials, John Dewey cannot be left aside. His idea was that children must have experience in order to strengthen the creation of knowledge, and not as a mere exercise: "It is not enough to insist on the necessity of experience, nor on activity as part of an experience. Everything depends on the quality of experience. [...] Thus the main problem of education based on experience is to choose the type of experience the children can re-experience fruitfully and creatively in the experiences that follow" (Dewey, 1953, pp.15-16). Working with materials at school is even more relevant in evaluating what has been produced and go beyond this inescapable frontier, already crossed by art, even in education. It is not a choice dictated by idleness but it is a priority, not only from a pedagogical point of view aimed at supporting sustainability, but also for the surplus of creativity that comes from working with materials.

This paper presents the first results of a theoretical and empirical survey that investigated the meaning and effect of working with materials in preschools and primary schools, based on two parallel and complementary processes: finished objects (daily or familiar objects reutilized and given new meanings, unknown objects with different meanings) and unfinished objects, using recognizable or unrecognizable materials which were either new or had been previously recycled or used (by the children or the teachers). This investigation was inspired by artists who use finished objects or parts of finished objects in their works, juxtaposing the objects or creating installations made of matter and materials. The analysis was carried out starting from a survey of existing pedagogical and artistic literature, as well as through direct experience and documenting experiences using both types of objects in both orders of schools, based on the hypothesis that both types of materials could support diverse creative processes.

2. Objects and materials in pedagogical thought

The peculiarity of finished objects presented to children, meaning artistic, naturalistic, scientific and also daily objects, including waste materials, seemed like offering them a significant view of reality. By investigating the specificity of each object, we can always discover a range of possible explorations which refer to materials, colors, forms, uses, designs, thoughts, stories, people, relationships. They are pieces of the world which enter the classroom and offer new stimuli.

Regarding this aspect, especially during early childhood, Fröbel talked about the objects collected by children and the relationships with these objects, which define the child's very essence, creating the boundaries and giving the child an idea of him or herself (Fröbel, 1826). This same ideas were also pointed out by some pedagogues in the past, who confirmed the importance of concreteness and direct activity in education, and they listed which objects served to develop certain didactic proposals. Among them, Rosa Agazzi noted in detail what objects could be on show in her so-called Museum of "unpatented bric-a-brac", a free Museum which housed "small boxes, buttons, seeds, little tubes, thread, nails, cord, cards, little bottles, corks, fabric samples, paper samples, little balls, small jars, packets, postcards; and various materials: wax, iron, tin, marble, wood, leather, glass, ..." (Agazzi, 1938, p. 13). This varied collection of objects, thanks to a caring eye, can become a powerful means for enriching linguistic development, logic and reflection through manipulation, naming, dividing, creating categories, storytelling, modifications, for example. Often the items were things from the children's pockets, which would usually be thrown away if found, together with other things collected and added by the teacher.

For the purposes of research, it is useful to note the importance of the authorship of this action. The active parties can be divided into 5 categories, below we will cite just a few of the pedagogues linked with them. Those who can choose the objects are: the children themselves, spontaneously, using what they collect in a casual way; these objects are found and brought to school by the children due to their instinctive interest and only at a later time are they used with a didactic aim (Agazzi, Lodi, Malaguzzi, ...); the children themselves, intentionally, making a willing and specific choice regarding the choice of the objects brought to school, showing awareness of use and thought (Agazzi, Pizzigoni, Freinet, Lodi, ...); the children in response to the teacher's specific request, in order to make use of these objects in a specific way in class (Agazzi, Pizzigoni, Freinet, Lodi, Malaguzzi, ...); the teachers, who bring materials to school for a specific didactic purpose (Gabelli, Agazzi, Pizzigoni, Freinet, Lodi, MCE, Malaguzzi,...);

pedagogues or experts, who invent and create particular tools and materials to develop learning opportunities (Fröbel, Montessori, Pizzigoni, Kerschensteiner, Freinet, ...). If in the first cases the choice of objects can have various aspects, the selection carried out by adults also can be considered from many different points of view.

Given that bringing objects to school is almost a daily occurrence, what actions can be carried out with these objects and what is the debt to modern and contemporary art? In reference to Montessori and her carefully designed materials (Cives, 2004), a few fundamental characteristics can be pointed out, useful for making comparisons, singling out the similarities and differences from other experiences that involve objects. There is the esthetic aspect, so that the objects are attractive and fascinating, they catch the eye and make you want to take them in your hand; the activity proposed, so that the objects are easy to use and transportable by children and offer the possibility to be used well; error control, so that the material is designed in such a way that errors are immediately evident and allow children to correct themselves; the limits, so that the material is circumscribed, and does not present excessive stimuli, aiming at creating mental order within variety. The possibility for exploration proposed by Montessori is based on the sensorial isolation of the specific qualities of each object, offered to the children in a particular order.

On the contrary, many recent educational experiences provide for the free exploration of objects, and develop thematic investigations only afterwards. There are diverse experimental experiences in infant-toddler center settings, like the Treasure Basket and Goldschmeid's heuristic play, where everyday objects are offered to children for tactile investigation (Goldschmeid & Jackson, 1996). In this field, the study regarding children from ECE centers and preschools entitled "Di fronte agli oggetti" (Galardini, Giovannini, Mayer, Musatti, 1995), theorized that free exploration not only leads to individual learning, but also to broader reflections which are more articulated if children are allowed free reign. Susan Isaacs Sutherland (1971) in her school for children aged 2 to 8 managed to offer seemingly opposing proposals: objects of all types, together with didactic materials from Montessori and other pedagogues, with the declared objective of stimulating active research on the part of children, rather than teaching them. Reflecting on action made possible through objects and materials with older children, David Hawkins' thought is useful. In order to make up for lacks in learning science, he theorized a fundamental phase of free exploration when children could freely explore objects and materials: the idea was to allow simply knowing a variety of things and their relationships, before undertaking thematic study. This initial phase required a good amount of time and was the fertile basis for all future learning (Hawkins, 1979). The methodology proposed by Mongay Maite Pujol and Cunill Nùria Roca (1995) included an initial phase of spontaneous action, where children moved in an unplanned space and had contact with unstructured materials and objects, leading to greater structuring and shared intentionality.

A final reflection on objects and materials was made by Dewey, who criticized Froebelian gifts and Montessori's materials, which he felt were too defined, also regarding the actions they could be used for. "It is true that those materials control the operations of the pupil to avoid errors [...] But starting from raw materials and manipulating them intentionally, pupils' intelligence took form in finished materials (Dewey, 1984, pp.254-255)".

The introduction in preschools and elementary schools of unusual, recycled and discarded industrial materials seems to go one step further, since children can explore and generate connections, transform and reinvent, promoting creative thought (Eckhoff & Spearman, 2009), as well as express and share feelings and thoughts (Gandini, 2005).

The proposals, with differences and specificities, dedicated to bringing discarded and recycled materials into schools are present throughout the world. A bastion of working with discarded industrial materials in schools is Remida, part of the Reggio Emilia Approach, deeply interested in the connections between children and their environment (Edwards, Forman & Gandini, 1993). In this approach, children are encouraged to search for knowledge and understanding of the world through immersing themselves in it (Samuelsson, Sheridan & Williams, 2006), including recycled or discarded industrial materials. Remida "collects, displays and offers alternative and reclaimed materials obtained from unsold stock and rejects or discard and scrap materials from industrial and handicraft production, with the aim of reinventing their use and meaning" (Reggio Children, 2005, p. 9). Besides Remida, there are other similar organizations like Weave Recycle, a Creative Recycling Centre and Educational Training Provider, and the House of Objects, a centre offering reclaimed, reusable and recycled materials to its users, both in the UK; Reuse Alliance, a community of like-minded individuals and organizations across the USA

dedicated to finding new uses for things and for waste; ArtsJunktion mb, a community-based organization committed to redistributing reusable materials.

Working with recycled products, designed for specific purposes and apparently at the end of their useful life, and discarded industrial materials, which are new since they are unused due to production excess or defects, is a particularly interesting choice both in terms of sustainability, containment of waste and respect for the environment. This paper explores the use of these materials in education through their intrinsic adaptability, which is not only physical, but also from the point of view of the thought processes developed.

Summarizing the various proposals made schematically, we can draw up a list of the points materials and objects used at school offer for consideration: the choice of materials, who uses them and why; the type (natural-artificial, simple-complex, structured-non structured, familiar-unknown, new-used, ...); operative proposals (observation-description, structured and unstructured activities, free exploration, deconstruction, modification, transformation, ...); how the experience is elaborated (individually or in a group, re-proposal of similar materials with variables, discussions, ...).

3. Objects and materials in art

If we consider the aspects linked to art, it is interesting to notice how in these cases materials and objects have been able to invade this field in different ways. There are parallels to what takes place when these experiences are proposed in school settings. Looking closely at 19th century art, not necessarily in chronological order, especially at the use of objects (Francucci, 2009), we can reflect on the decontextualization first used by Marcel Duchamp (Marcel Duchamp, Bicycle wheel, 1913, New York, Janis Collection) and the Dadaists with ready-mades: objects extrapolated from their daily context inserted into another space appear under a new light, detached from function, with attention placed on the shapes, colors, materials, structures and all the potentials that we might otherwise have overlooked in the same way that every day objects inserted in school settings allow for new explorations, unusual thoughts that break away from the obvious and facilitate connections. Thanks to the cubist collages of Braque (Georges Braque, Still life (guitar), 1913, Philadelphia, Philadelphia Museum of Art) and Picasso (Pablo Picasso, Still life with chair, 1912, Paris, Musée Picasso), pieces of reality erupt from the painting, becoming a symbol for everything, where the newspaper headline represents the newspaper itself, the theater ticket glued on as is, permitting mixtures and contaminations where real and painted objects are equal, flowing between reality and fiction. The same can be said for children's collages and installations, where real and recreated objects are part of a constant dialogue, where nothing is out of place. Going even further, in New Dada, Jasper Johns and Robert Rauschenberg (Robert Rauschenberg, Dylaby 1962, New York, Sonnabend Collection) entire objects are used. Sometimes found in the trash, they are united in a combined work where elements of painting, two-dimensional and three-dimensional images are placed into relation with one another, in a continuous relationship with life. Another important artist is Tony Cragg (Tony Cragg, Spectrum, 1982, Private Collection): He starts from objects (discarded and not) and then re-categorizes and reinvents a new order. In this profoundly objectified art, there are many stimuli for contamination with a certain type of scholastic planning and action, aimed primarily at increasing new ways of thinking and experimenting with day-to-day life. For a child involved in experimenting with objects, this becomes concrete not only in the vision but also in playing or in constructing. Working with finished objects seems to comment on their use, with a different function with respect to the usual one, new attention develops regarding what is already familiar, stimulating questioning, proposing reflections on the single parts of the whole, moving beyond new facets and breaking with the defined.

As far as regards recognizable and unrecognizable finished materials, which are the fruit of an industrial practice which leads to production surplus, accumulation and discard, there are many examples of contemporary art we can consider. Attention towards these objects becomes tangible in an artistic practice which uses trash, rubbish and discarded materials (Vergine, 2006). Waste is an integral part of art, from futurists like Kurt Schwitters or Picasso or Marcel Duchamp, leading to the invasion of art forms that are more and more advanced and disruptive. Nobody thinks of contesting the first contamination of art with elements initially considered vile (ripped paper, cords, scrap metal, tickets). Some movements including Fluxus, Visual Poetry, Nouveau Réalisme and Pop Art use waste as a

privileged element, a sharp criticism towards consumerism. In the '80s and '90s contamination meant using hobbies, plagiarism, citations, creating new images or installations starting from existing ones and discarded elements. Waste has become a metaphor, a provocation, a reflection, a global process (for example: McCarthy, "Assortment- Daddies ketchup", 1994, Courtesy Galerie Georges-Philippe et Natalie Vallois, Parigi-Kounellis, "Senza titolo", 1993, Courtesy Christina Stein, Milan). This passage can be used in schools where use and reflection regarding these materials necessitates adult participation placed in relation to the constant and excessive consumption of our society and the giving of value and the re-appropriation of constructive and sensorial practices which involve children from a young age.

4. First questions from exploratory experiences

The experience we will briefly discuss is an example of an exploration in light of the existing literature focused on a few educational-didactic projects which included workshops on objects and materials, carried out in a few pre-school and elementary school classes.

The projects were similar in that the introduction of objects or materials through direct experimentation over a lengthy timeframe in a continuous way promoted learning in many directions and allowed for a variety of experiences which were not unidirectional with indications given by or led by adults. In this way, the offering of open situations allowed for experimentation and manipulation of reality, necessary to develop creative thinking in children (Munari, 2009). If, in fact, children do not know materials and their possibilities for use, creative relationships cannot come about. Creative thought is meant as a particular cognitive process which takes shape thanks to the ability to create relationships and transformations based on the knowledge that the subjects have regarding reality and their capacity to answer the questions it poses (Munari, 2010). Starting from these open proposals, each work process focused on a specific area of research over time for each group of children.

Below we will summarize the main points which emerged from the documentation, showing possible hypotheses for new and more focused areas of research.

The first results from the experiences carried out in preschools and primary schools with finished objects brought up the following points and questions. Finished objects, everyday objects, became interesting after they were recognized if de-contextualized and used for other purpose (ex. A fork used to decorate a surface). Shapes and materials opened to new horizons, moving from what was known by giving value to the sensorial aspects and using one's hands in a different way. If the objects were strongly characterized from a disciplinary point of view (in particular in primary schools, for example with mathematical didactic materials used for playing and creating artistic compositions), they were "rethought" and opened to contaminations from various disciplines. If they were parts of unknown objects, the hypotheses after their having been manipulated led to articulated thoughts, which are concretized in experimental use and in words, raising more and more detailed questions and forming hypotheses. If known but used together, they lay the basis for metaphorical thought and planning: it was a question of pretending, where single or multiple elements created new possibilities for thought and play.

Projects with finished objects, if appropriately supported and developed over a long enough period of time, can lead to a reflection about the relationship between function, form, esthetics as well as the chance to design new creative or functional objects, starting from the ones observed and manipulated, as emerged in the project "Giving Form to Ideas", conducted with the Education Section of the Fondazione Arnaldo Pomodoro for Primary and Secondary schools.

Regarding experiences with unfinished materials, workshops were run within a project in the Teacher Training Faculty at the University of Milan-Bicocca, in collaboration with the center for creative recycling Remida@Muba in Milan to educate adult teachers-in-training regarding materials and where to get them.

There are numerous, documented, articulated experiences to recount, all exploratory despite focusing on diverse, specific aspects. Linguistic research was observed, where children were involved in singling out appropriate words to describe materials which were not immediately identifiable or nameable. In this case the focus was on the characteristics, qualities, uses which made it possible to distinguish what was not easily recognizable, re-elaborating and enriching verbal skills. In other cases, the studies were developed more around mathematical aspects, through

classifications and cataloging materials according to their characteristics which at times were scientific, considering characteristics like surface, resistance, weight, strength or balance, or constructive aspects. The materials were an invitation to share ideas and compare hypotheses and also to form relationships, since they offered a common connection between children who would not have taken part in more structured experiences. In this sense, the exploration of materials was easily structured according to not only cognitive but also emotional logic, as described through the feelings that their use evoked or recalled. In this sense, we can agree that “listening to materials makes traces of their identity emerge and brings out our experiences” (Brighenti as cited in Gandini & Kaminsky, 2005). The symbolic potential of materials is evident in other areas (Kelly & Lukaart, 2005), especially when children use them in symbolic play or when narrating stories, expressing themselves through metaphoric thought which, like creative thought, singles out imaginary relationships between elements. Last but not least, visual, or sonorous or bodily esthetic characteristics have been analyzed within the artistic dimension according to logic which is less realistic-figurative and more expressive.

Exploring materials together with an adult who supports without being directive towards a particular result over an ample period of time allows children to experience different possibilities, to study and develop multiple languages and different competences in a multidisciplinary perspective which is even more global since it is favored by deconstruction and versatility. The simultaneous possibilities offered by the use of materials, more so as they present indefinite characteristics and thus are more “open”, compared to the fragmentation of knowledge which results from more directed proposals, allows to embrace several ideas at the same time.

Besides this, unusual materials allow children to discover explorations over time which are more congenial to them, responding to their interests and their competences and accompanying them into their zone of proximal development in a natural way. Unusual material allow for a vast range of interpretational possibilities, which becomes especially evident regarding discarded industrial materials: since this material does not have a specific, characteristic use, it naturally lends itself to questions and attempts to find solutions. The lack of direct, univocal function makes these materials particularly fertile for children to use, since it sustains them in their questions, investigations and natural problem solving strategies.

In short, working with unfinished materials, as has been shown in the Remida project, supports children in using creative thought, meaning their capacity to generate new, original connections between information, thoughts and objects. The juxtapositions and the transformations of the objects allow new, meaningful and valuable attributes to be made, encouraging new and original viewpoints regarding everyday life (Taylor, 2006), making them material pretexts which naturally support creative research, typical of childhood, able to promote corporeal, symbolic, constructive, sonorous, sensorial, linguistic, mathematic and scientific explorations. Unfinished materials, especially recycled ones and industrial discards, are extremely interesting objects thanks to the creative possibilities which they offer to children, since using them involves fewer traditional formal, structural and functional references. This in turn leads to unusual and original connections which are not pre-definable, not only in terms of the actions of children exploring them, but also in the thoughts which accompany them and inspire reflection and discussion.

5. Conclusion

Working with finished objects showed that using these materials with different functions than the usual ones allowed for the development of new ideas regarding already known objects, stimulating reflection on the single components which composed the whole, creating novelty and moving away from the expected. The use of unfinished objects highlighted the indefinite qualities of unstructured materials, especially materials discarded from industrial processes, offering new opportunities also both for the teachers leading the workshops, as well as creating very specific areas of investigation for the children who experimented with several languages and thus learned on different levels, stimulating them to find creative strategies to deal with the questions that came up.

This exploratory survey confirmed that working with different types of materials makes it possible for children to develop their creativity through different but equally important pathways, useful to develop strategies for experimenting, broadening and deepening the use of materials at school both theoretically and methodologically, so that the choice of which materials to use is more and more intentional on the part of the teachers.

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