

Bordercrossings

Encounters with living things

Digital landscapes







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Digital landscapes

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Istituzione of the Municipality of Reggio Emilia
and Reggio Children



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Digital landscapes

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in collaboration with

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Research notes

by Paola Cagliari

School for 0-6 year olds cannot be extraneous to the contexts they live in. Which is how the first research on the encounters between children and computers in municipal preschools in Reggio Emilia began its life in 1984. It was an adventure proposed by Loris Malaguzzi, always attentive towards phenomena in contemporary life, and who decided preschools could not remain indifferent towards the first appearance of personal computers in offices and homes.

Digital technology in the form of computers, printers and ‘turtle’ floor robots¹ was introduced into our preschools, integrated into classrooms and ateliers in interactions with the more traditional ‘languages’, at a time when few other primary, middle and secondary schools were broaching the subject, and those which did confined computers into separate laboratories used at certain times – a way of working they would continue, we might say to the present day. Reggio Emilia’s preschools have always constructed contexts around computers that make it possible for children to work in small groups, in contrast with the modes of working (and prevailing concerns) which preferred to see users (adults or children) alone in front of a computer. In the 1990s scanners, digital cameras, video projectors and dual computer work stations were also introduced into the schools, giving potential and support to children’s collaborative group work in simpler ways, and with a more intuitive approach. In fact these tools amplify dialogue between children and computers in the same space, making it more visible and shareable, and they initiated an *immersive* quality that has become predominant in all of our experiences. They are also tools that make computers less ‘solitary and self-sufficient’, increasing the likelihood of children producing interactions and hybridisations between different ‘languages’, shifting children’s attention (and especially that of adults) away from screens to potential relations. The way we were oriented was always to make the digital dialogue with other materials children have available to them; for example a scanner with clay, or metal wire, or with natural materials. So that digital technology gradually became integrated into children’s living spaces and learning contexts, heightening their senses and perceptions, offering new tools with which to investigate, and giving new potential to the expressive and

aesthetic qualities of representations and narratives children use to give form to knowledge.

This long path we have travelled since 1985, not without stumbling and encountering difficulties, still offers important suggestions for imagining environments augmented by digital technology.

Traces of these experimentations are present in the *Bordercrossings* exhibition, offering areas open to deeper field research in the future; they can be seen in the *Research Notes* video at the start of the exhibition.

The challenges of programming and its codes

I would like to introduce this aspect by telling readers the story² about the first time we tried working with a computer, an experience in which I was an active protagonist, together with three other teachers.

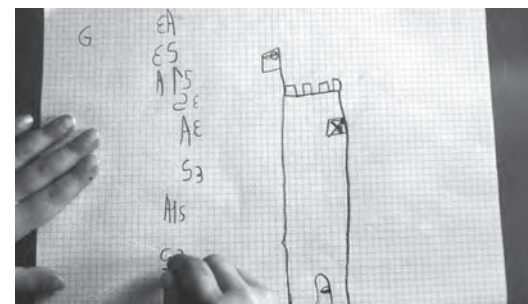
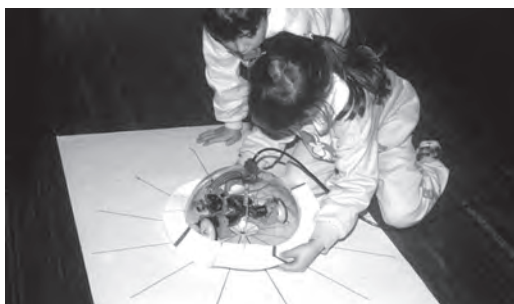
The computer we chose to try out, in 1984, was awkward compared with today’s models, but tiny compared to calculators filling entire rooms in ministries and large companies.

It certainly wasn’t an attractive object, but the children imagined and expected great things of it.

In fact on the green background of the screen there was a small triangle, called a turtle, with one corner highlighted, and when it moved it drew a black line. In order to ‘speak’ to this turtle we adopted a simplified form of Logo, the programming language invented by Seymour Papert and his colleagues, which is still an essential structure in all programmes used to start children coding. A very precise syntax was needed to move the turtle around, a sequence made up of a command initial (**F**orward, **B**ackward, **L**eft, **R**ight) – space – number – return. If the sequence wasn’t formulated correctly communication became impossible. The turtle learned from the children. When they made a name from a command sequence and wrote the name a second time, the turtle drew the drawing again, always the same drawing but sometimes starting from a different point, so it didn’t always do what the children expected.

¹ Robots created in the 1960s, capable of moving on a flat surface using commands in the Minilogo language with transmission by keyboard.

² Immovilli G., *Quando due intelligenze si incontrano - I part*, in ‘Bambini’ n. 11/November 1985, pp. 22-28; Castagnetti M., *Quando due intelligenze si incontrano - II part*, in ‘Bambini’ n. 12/December 1985, pp. 76-80; Giacomini E., *Quando due intelligenze si incontrano - III part*, in ‘Bambini’ n. 1/January 1986, pp. 82-87; Cagliari P., *Quando due intelligenze si incontrano - IV part*, in ‘Bambini’ n. 3/March 1986, pp. 71-75.



Initially the small group of three children was disappointed not to find a video game (though these were rudimentary compared with today's games), however they soon got carried away with their challenge, and after working for eight mornings the lines of a castle proudly bearing a flag was their result.

It wasn't a beautiful castle, not compared with the castles they drew and painted and built in the classroom using their traditional technologies of paper, felt-pens, tempera and water colour paints, or wooden and recycled materials.

So why offer this experience to the children?

Because the significant thing was not the product (much as aesthetics is an essential quality of learning processes), the significant thing was that the turtle had learned to draw the castle 'on its own'. Writing 'castle' was enough for the turtle to draw it without any further input from the children. It had been *programmed*.

So the children had learned a new code/language, necessary for dialogue in that environment. They had organised a logical process of programming.

They had experimented with actions mediated by tools: the keyboard, and the screen.

They had elaborated theories about computers that were deeply philosophical and debunked certain myths: 'It's intelligent' they said, 'but only a bit. It gets its intelligence from us'.

They had transposed problems of direction, orientation, length and dimension from a 3-dimensional horizontal space in which they moved themselves, to a 2-dimensional vertical space on a screen. They had had to formulate the concept of viewpoint, and transpose concepts of right, left, forward, and backward, to turtles in different positions on the screen.

Once they saw the need to deal with different issues of angle and direction the children asked if they could write D (destra/right) and S (sinistra/ left) on their hands. At one stage the turtle was head down and opposite the children, virtually, on the screen. One of the children, Alan, switched his hands over, swapping their positions, left and right, to mirror the turtle's, and identifying the right command (D or S) to make the turtle go left or right as desired. These are important and difficult processes: to the extent that someone had invented a turtle for the floor, a transparent Perspex semi-circle, on a string that stopped it moving around freely or making accurate lines, and which we put away in a cupboard straight away.

They are processes a group of three children discussed in

sometimes-heated conversations, in negotiations, in trial and error, in exchange, and with the strength of minds bent to the same purpose.

So a new tool made it possible to look at problems with 5- and 6- year old children that we couldn't have imagined before.

For me, as a young teacher, it once again confirmed children's unexpressed potential, and the importance, which Malaguzzi always suggested to us, of trusting in them.

In the *Bordercrossings* exhibition we can see another two passages of programming, related to experience with sensors and robotics in the 1990s and 2000s. Here, robots moving through the same spaces as children were equipped with sound and movement activators, commanded by computers at a distance, and interacted with the surrounding environment through contact and temperature sensors, all adding a dimension of care and affect to the experience we had with the turtles. In contexts children imagined, they worked on giving new life to a branch the snow had broken, and created a habitat of friendly inhabitants willing to collaborate in acting out strategies to resist the weather (the sun's burning rays for example). Then they put together a robot that would carry bread to birds living in this same branch. To our mind, this transfer of feeling and sentiment, from living subjects to robotic elements is an attitude, the foundation, for an ecological sensibility towards life and relations.

The children say:

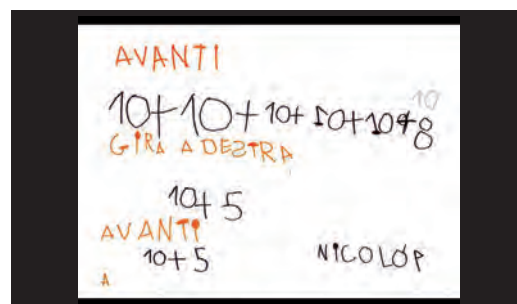
In my opinion if we use the robot's sensors it will turn into an electronic branch. Luca

It could turn into a branch with robot life. Anna C.

Is that pretend life? Giulia

It's special life because it's different from ours! It can have a 'select' life, you know, like the TIM telephone advert says. Francesco

No new experience can be separate from life and the meaningful questions it poses for children. The important thing is for adults not to forget this by believing, as we often do, that programming and codes are simply a question of technique, logic and computation. In the weaving of philosophy, humanity, relations and languages, constructed together by adults and children, children explored their knowledge meta-cognitively, and encountered another's ways of knowing and languages, that is to say, of robots. They were able to explore the relativity of the concepts of space, measure and speed, through procedures based on trial, error, and comparison.



In the form of words and drawings they worked to design relations and stories, activated their capacity for foreseeing, and verified their ideas in the robot's actuations. We do not believe children have to become programmers of artificial intelligence, but we do feel programming, with all the differences of context, can be an extraordinary opportunity for learning and research.

Dialogues and hybridisations between atoms and bits

In the 1990s, with the arrival of low-cost input and output peripherals, the dialogical, processual, and creative capacity of children and computers grew even greater. Children, in their everyday life, seek to give shape to ideas and make representations of the world: they look for forms and means capable of recording and communicating their experiences and thoughts. Their visual landscapes, painted and drawn, and the forms of communication they elaborate, are made more complex by scanners and digital cameras. A digital camera turns into a sort of 'hyper-eye' and lets children produce multiple different representations of the same subject. Representations of what is real are close to reality itself, and support the building of relations, comparisons and dialogues, and new interpretations of the subject we are knowing. Digital cameras and scanners let us import images, materials, colours, and shapes, taken from reality, onto a computer, where we can modify them, enrich them, and mix them with one another, or with our own interventions in drawing, thus creating new qualities of perception previously unimaginable. Video projectors let us share our work with others as we are creating; let children's representations (in drawing, painting, construction) become part of the space they are inhabiting, in immersive experiences that continue to fascinate today. These aesthetic and emotional experiences are very powerful for knowledge. The ease with which imported elements can be replicated or multiplied, and the realistic appearance of these images and representations, offer new and playful possibilities. This is what happened when we offered the children a traditional lasagne lunch on the last day of school before summer vacation, something much appreciated by the children. However on this occasion it was offered in a highly realistic but completely inedible visual form. The lunch was produced on paper, and created with the complicity of a digital camera and scanner, real plates, serviettes and cutlery, and servings of pasta, ragout and béchamel sauce, all waiting in the kitchen to come out and console the victims of the joke. When we augment potential for transferring images from one device to another and make children autonomous, not only is the idea of network and dialogue between different devices an intuitive, practicable idea, but the different representations produced can be visualised, explored, compared, and evaluated. In practice, digital tools are offered to children as a powerful means of interacting with experience and ideas, and giving them

form: they multiply, animate and transform children's drawing, painting and sculpture work, and their verbal and physical narratives. New relations are made possible with the subjects children are knowing, through variations children seek out and create themselves. Moreover children's processes and products can be more easily memorised, become small documentations and 'multi-media' forms of communication. This is how digital technology contributes in giving new forms to traditional 'languages'. Music, drawing, colour, and material representations acquire different qualities when they encounter contexts that contain a possibility of interaction, movement, and hybridisations between languages. Our experience shows that not all 'languages' need to be digitised (made of the same 'bit' material) for hybrids to be obtained. They can be produced in encounters between atom and bit, between material and immaterial, engendering new and original possibilities for representation. These kinds of processes began to be more accessible in the 1990s with the arrival of increasingly friendly interfaces. This opens up great possibilities but also requires a certain caution. Technology designers try to avoid or anticipate emerging questions such as 'How can I do this?' or, 'This is something I can't do yet'. But these questions are useful for reflecting together and finding solutions that increase knowledge. So it becomes the school's task to unravel the thinking processes activated by these new representations and make them explicit, utilising a new and more contemporary approach to knowledge.

Communication at a distance

Digital technology makes it possible to construct knowledge that can be realised by connecting different and distant real places, related in a reticulate or radial form. This is a possibility we explored between 2002 and 2004 in a research project in primary, middle, secondary and preschools in Reggio Emilia, Italy, and in Stockholm, Sweden³. This idea of connected-up thinking, of several authors, and incomplete and flexible kinds of knowledge travelling between one place and another, constantly changing, was part of a new cultural imaginary that didn't exist before, and although it has rapidly become pervasive in our societies it is still relatively recent. To my mind, certain questions we asked at the time are still relevant in today's schools: how can these new 'spaces'

³ Research carried out in 2002-2004 as part of a European project titled *E3. E-context, e-technologies, e-early learning*, which involved two of Reggio Emilia's municipal preschools (la Villetta and 8 March) and a state school, a Swedish school (Lemshaga Academy Ingaro with children aged 4-16 y years), the Reggio Emilia Institutet of Stockholm, and the Computer Technology Institute and Hellenic Open University in Patras, Greece. The aim of the research was to construct a learning platform through distance exchange, coherent with an idea of socio-constructive knowledge, and of schools as places of production of knowledge and not transmission of contents.

amplify and modify the kinds of collaborative and co-operative (socio-constructive) learning we feel is the most useful kind of learning today? And again, how can these communication networks, in which one almost never knows the person one is connected to, enter schools, changing, and introducing a different ethics and practice of web connection?

Digital media and learning (or on an excessive confidence that digital technology can change schools)

Increasingly, computer media have offered qualities that make them particularly important in constructing children's learning:

- synergies between 'languages', which computers with peripherals make possible;
- simulation as a strategy of trial and error, with the added value of 2-way reversibility, being able to retrace our steps;
- the possibility of creating memory of a process and going through it again;
- rapid transformations, which show greater solidarity with creative imagination;
- distance communication as a possibility for extending learning communities beyond spatial contingency;
- greater possibilities for children to offer themselves as social subjects from inside schools (making themselves easily visible as interlocutors and producers of cultural proposals).

Our research, over time, has led to us finding ways in which schools can manage to make room for these experiential possibilities, generating processes of acculturation, knowledge, of contact with a reality, imaginative elaboration and cognitive construction, which let children structure criteria for access and interpreting, and leading to new possibilities in thinking. However computer technology alone cannot change the learning/teaching relationship traditionally acted out in schools. For that we need new and different conditions in places of education and in professional development; an interdisciplinary approach that extends to the way the school day is organised; a socio-constructive approach to knowledge; and 'environmental' care when inhabiting and furnishing spaces with materials and tools capable of 'solidarity', and of extending children's and adults' thinking processes. Environments that offer good, and several, materials and tools for us to act with, build with, and think with; where traces of our thinking can settle, as a strategy for memory and re-elaboration; environments that encourage attitudes of research in children and adults, and support a design approach to building knowledge, integrating with, or replacing, the approach of pre-defined programmes. Different contexts that credit computer mediated technologies with the role of 'environments' which contribute to giving good form to the learner's efforts to represent-understand-communicate. Environments/contexts capable of participating in children's research into meaning, and their narratives of the world.

Conclusions

The development of digital technology and information networks is producing significant changes in our ways of learning and communicating, our ways of constructing knowledge and identity. Between schools which tend to confine computers in special labs, and predominantly teach IT techniques, separating technology from a sense of humanity, and other after-school activities which only offer technology's gaming and relational dimensions, we must think of places for creative, constructive, meta-cognitive reflection on the potentials of these tools.

We must let children discover that what we have with digital tools is a *dialogue*, in which it is necessary for the intelligence of human beings to meet the intelligence of devices. A dialogue in which these two intelligences reciprocally shape each other and co-evolve, and where the rules of the game must be in the hands of both players. Schools must be an opportunity for children to elaborate the means, to be active protagonists in realities that, for thirty years, have been part of everyone's general fabric of experience, a social, political, cultural and economic dimension of the contemporary world.

Over the years digital technology has offered us an increasing number of tools for creating experience that is *sensorially-augmented*, modified and enriched, with unexpected and previously impossible perceptions: the dimension of macro, the shift of points of view, and the creation of inexistent realities – to name just a few. These have always been the work of art, which creates imaginary spaces (paintings as screens for example), but in virtual reality there is a new dimension of interaction. That is to say we can be a part, we can co-author, these new sensory realities.

Virtual reality is not produced by digital media, but is a product of our culture, and there is a great continuum between realities we have always inhabited and these new virtual realities. As educators and teachers we have to be capable of understanding these continuities, which let us understand differences. Only then can we organise our didactics in such a way as to integrate digital technology in meaningful ways. The 'virtual' is not a particular kind of reality produced by research into artificial intelligence, it is, above all, a space created by our human capacity for the symbolic – a primary function of our minds. Communication technology contributes to our capacity for making sense of the world, for constructing meaning and sharing it. The Italian philosopher Umberto Galimberti has warned of the risk of technology offering greater possibilities than our current understanding or needs. It is important for actions we are all creating (some of us more, some less) with digital technology networks to not only be a *doing*, but also the building of a shared culture and social practices, not simply carried out, but consciously elaborated and processed with a critical awareness.

The *Bordercrossings* exhibition has tried to make a contribution to this process.

Bordercrossings

by Simona Bonilauri and Maddalena Tedeschi

Artisan technology in infant-toddler centres and preschools

Neither opposed nor enthusiastic, the position we have always adopted on digital is reflective, and we continue to explore and investigate with this same attitude.

Technology enters into the daily life of Reggio Emilia's infant-toddler centres and preschools, not dominating other 'languages', or replacing them, but mixing with them. It enters in the form of 'environment', not as pure equipment and function, but as a connector of areas of knowledge and multi-disciplinary explorations. It supports children's ways of knowing and inaugurates new environments of socialisation and sharing where each child's 'mental' world – which includes external stimuli and interior representations, at the same time cognitive and emotional – can be expressed and communicated.

In digital environments we have explored, as with all our educational contexts, children act as authors and constructors of their own knowledge, and of their own individual and collective imaginaries. They invalidate the idea that technology is anaesthetising and the centre of attention, and make visible another idea, generative and amplifying, in dialogue with the scent of moss and the growth of life.

Digital has the potential to change learning-teaching contexts, offering new modes of representation to children's thoughts and theories, and a cultural dimension capable of fusing the abstract and the artisan. In digital contexts children work simultaneously on different levels of representation, gaining practice in flexible, hybrid, integrated ways of thinking.

The intelligences we aspire to are not strictly disciplinary, but connective and synthesising, intelligence which can be constructed as we [re]search into meaning, on the border areas between the different languages.

'The virtual does not cancel ordinary reality, or replace it, but limits itself to breaking reality down into fascia of sensory relations that course through it, until each object is shown no longer to be a given, but the product of just one of a myriad possible modes of perceiving it. In short, until showing reality – our way of recognising and interpreting reality – is always the result of a construction process, or better, a piece cut from our chosen point of view.' (Arturo Mazzaella)¹

In our experiences with children in infant-toddler centres and preschools we have imagined a kind of *artisan technology* that keeps the artisan and digital dimensions connected. We do not interpret digital as simply a de-materialisation of reality into pure sound or vision, but as a something that multiplies levels of materiality, a builder of artefacts transiting between analogical and digital, and vice-versa.

'The studio of a technology artist is a studio that mixes pencils and graphic tablets, all kinds of colours, prototypes, models, different installation materials, mechanical and electronic tools, computer workstations with networks of peripherals, video and mixing stations, and photography and film sets; and where virtual design on computers mixes with hand-drawn sketches, flip-charts and storyboards. Therefore the 'artisan' dimension is not lost, but its characteristics and applications become altered, flexible manual skills are challenged by materials both physical and virtual, and already experience a synaesthesia between natural senses and the artificial in the embryonic process of creation and design. The 'artisan' dimension gives a human quality to the creative process unfolding, it leaves marks and traces, layers the intentions, gives density to experience, and brings different competencies closer together.' (Andrea Balzola and Paolo Rosa)²

A learning environment is not simply a container or background: organising the spaces of a school means organising a metaphor for knowledge, giving centrality to learners.

This choice of values comes before choices of economics and function: when we discuss architecture, furnishings and equipment we are discussing our image and vision of humanity, society and inter-personal relations.

Therefore we think of designing contexts where children can experiment with increasingly sophisticated research structures, ask questions, formulate hypotheses, find forms of experimentation for those hypotheses, and construct theories as provisional explanations for the phenomena and things around them.

Digitalnature

The intention with the projects included in the *Bordercrossings* exhibition is to bear witness to the intense work developed together with children, and offer samples of the different-shaped journeys made, and which continue to be made, in-between digital and nature.

This slightly paradoxical-sounding word pair, digital and nature, runs through the entire exhibition, in an attempt to integrate nature's complexity with the complexity of the digital. In particular we have tried to humanise the digital coming into contact with nature, making it more 'artisan', creating hybridised, reciprocally contaminating worlds, where analogical and digital co-habit, and together produce new ways of investigating and representing.

This osmosis between nature and digital, their contiguities and border-crossings, let adults and children have a project approach that attempts the fusion of two different domains, interpreted as *digitalnature*.

¹ Mazzaella A. (2008), *La grande rete della scrittura. La letteratura dopo la rivoluzione digitale*, Torino, Bollati Boringhieri.

² Balzola A., Rosa P. (2011), *L'arte fuori di sé. Un manifesto per l'età post-tecnologica*, Milano, Feltrinelli.



The point of view we adopted was phenomenological and ecological. We did not necessarily look for answers, but always tried to ask generative questions, or at least always give ourselves problematic answers.

We started out with some hypotheses to give direction to our trajectories of research:

- the passage from an anthropocentric approach to an ecological approach that considers the connective fabric of individual-environment relations;
- the co-habitation of analogical and digital;
- a digital 'pluriverse' as the expansion of nature;
- the indistinct mingling of nature and artifice;
- multi-dimensional and relational perceptions.

This was our perspective, keeping the analogical and digital closely connected, in designing indoor and outdoor learning environments in infant-toddler centres and preschools. The exhibition gives an understanding of these environments and their characteristics:

- connective environments in which centrality shifts from tools to research processes;
- inclusive environments with different digital and analogical media, creating a system of interfaces made up of devices, objects, supports and a multiplicity of languages
- environments where children can construct and deconstruct their narratives, exercising meta-reflexive competency;
- environments brought to life through the questions of adults and children, in relation to the limits and possibilities offered by interfaces between devices;
- environments where individual pre-figurations become common ground, converging to create collective worlds, constantly becoming;
- environments that inaugurate a new aesthetic dimension.

Possible worlds

In analogical-digital environments an imaginary situation (possible world) is created, and we know that in terms of cognitive development, creating an imaginary situation can be considered a way of developing abstract thinking. Children always engage in creative and combinatory activity by starting with elements of reality, which they then re-elaborate and transfigure with digital tools.

Often, children's work is made up of fragments of real images, put together to create a new reality, in a game of image-transformation that attempts to create a fantastical universe standing outside everyday life. These re-created, possible new worlds often evoke the dream-like metaphysical atmosphere of the Surrealist avant-garde artists.

A possible world is a space of sensory, narrative, and evocative amplification laid down in a digital image. Possible worlds present things that would otherwise be invisible to our eyes,

which is why they stimulate children to think in complex systemic ways.

Possible worlds create multi-dimensional and inter-disciplinary images that cross the borders of visual culture, and open up pluri-lingual codes.

Possible worlds are like theatre sets, *hypothetical enchanted looms* brought to life by children's hands and thinking, their creative *busyness*, trials and errors, approximations, and hypotheses for combinations, knowingly made.

And naturally, all forms of creative imagination contain elements of affect and emotion. Children have a desire to wonder, and to make others wonder.

The encounter with living things

In exploring and getting deeper into the possible world we have defined as *digitalnature* children investigated nature using technological tools, producing unexpected kinds of visibility, original conjecture, and contexts not seen before.

Areas of learning widely diffused and codified in our schools were woven with nature's freer, more vital learning, which enriches the meaning of educational experiences, and promotes thinking that is ecologically structured – thinking of nature as thinking of self.

A transversal focus in all these journeys was investigation from life, a process of knowing and relating: we enter an empathetic dimension with a natural subject to learn to know it, and know ourselves. This is why we speak of the dialogue between our identity and the identity of the subject observed: this is why we believe investigation from life is not simply *morphological* but *anthropological*.

Different angles come together in a life study:

- the value of context, that is, the relations of the subject with its life environment
- 'listening', as an attitude of empathy and contemplation toward living things
- listening mediated by digital tools in an approach that includes scientific, imaginative and expressive aspects
- the body and multi-sensoriality, which are necessarily contained in multi-disciplinary and inter-disciplinary research
- an ecological gaze
- a multi-dimensional context that supports plural representations of the same subject
- care and respect
- the time of nature: its transformations, 'movement', and unpredictabilities

A life study is discovery, recognition and re-invention, depending on the extent to which children can create new and different narratives of the original subject that go beyond the obvious, also using digital tools. In this sense we feel digital's meeting with nature expands the potential for both exploration and

representation, like a 'hyper-eye', nudging them to where it is possible to reveal the subject.

Blurring, micro-detail, and degrees of focus are the source of new representations that do not always coincide with visible reality, and may never have been seen before.

In a life study living things can be represented in such a way that their identities, sometimes concealed, can emerge.

Certain lines of work have hallmarked the progress of projects included in this exhibition, which we believe could form a starting point or basis for developing similar experiences in other infant-toddler centres and preschools:

- identifying areas for deeper exploration and research, that could be tried out with children as part of a life study, to be carried as part of an everyday context;
- building maps of possible uses for devices and software in the centre, and understanding what potential they offer when introduced into various analogical/digital environments;
- increasing children and adults' awareness of the value of organising, and archiving, data and knowledge collected in an experience. Memory is an important learning factor. It provides our predictive mechanisms with a foundation of experience they cannot be activated without. Therefore it is important to make a place that layers and weaves together information, data, analogical and digital artefacts, and images; a place that creates a platform for collective thinking. These ongoing archives, like an open-source memory, can be accessed, shared and manipulated, be considered a way of organising and processing the data of our own knowledge as time goes by.

'Ecology, as Commoner used to say – he was an old American pioneer – ecology is certain to be the alphabet of the future. We are part of an ecosystem and we must be convinced of this, that our earthly journey is a journey made together with the environment, with nature, with the cosmos; that our organism, our morality, our culture, our knowing, our sentiments, are all connected with the environment, with the universe, with the world, with the cosmos. And this is where, Commoner said, the great web of our lives exists, in this grand dimension, a dimension we find difficult to measure but which is the dimension a web requires; and whatever happens it comprises our life's terrain.' (Loris Malaguzzi)³

³ From 'Talk at a workshop on *progettazione* in the *scuola dell'infanzia*, 1988', in Cagliari P., Castagnetti M., Giudici C., Rinaldi C., Vecchi V. and Moss P. (eds.) (2016), *Loris Malaguzzi and the Schools of Reggio Emilia*, London, Routledge.

The thinking that supported the exhibition project

by Isabella Meninno



The journey that leads to creating an exhibition is a long and complex process of bringing a project to a concrete level of communication, capable of offering and becoming a place of discussion and exchange.

Just by existing the project already contained different *life forms*: exhibit, debate, publication, layout, installation; and not least an atelier, which transforms ways of inhabiting and conceptualising the exhibition even more. The project offers a space where thoughts can continue, and evolve, without settling into forms that are too fixed, crystallised or museum-like.

The layout is organised with spaces for reading, reflection, *action* and *staging*. It is, then, a place conceived to be experienced and transformed by the public, by children, by questions and discoveries, with spaces and equipment curated to support several processes, and which prompt a desire to catch a glimpse of places we can venture into, and there construct new imaginaries.

A journey which is not excessively packaged, never completely ends, and is made up of differing forms of communication, for a very mixed public.

The qualities of artisan-digital work

Many different aspects are present in the exhibition because schools wove and experienced several elements, in different ways, using similar digital tools.

Nature was the point we started from and returned to: a constant presence. Nature reproduces, transforms, transmutes and multiplies; nature expanding, combining, composing, fluid, immersive, welcoming, frightening, enveloping, reconciling and mysterious.

There is often assonance between these characteristics and digital material, and its possibilities, which duplicate, invent, archive, mutate, transform, surprise, expand, dilate, fluidify, distort, trick, confound.

Schools made these words, and these associations, their own, and invented new ones, because they have *artisan hands* and *contemplative souls*, which is why they *constructed* thinking and tools as artisans and inventors. They used their equipment in creative and provisional ways, unsuitable and precarious ways, inventing new spaces and environments, adapting them to needs and desires.

The exhibition was created on the wave of this thinking. The criteria for its layout retraced the steps of schools and curated similar spaces, sometimes larger, sometimes selecting a detail, or a particular area of research, or highlighting one quality of a project. Certain equipment and inventions have been offered anew, transforming and adapting them to the environment, to give atelier visitors an opportunity to leave traces and suggestions.

The fluid spaces crowd with new images and become 'environment'.



The Marco Gerra exhibition hall, Loris Malaguzzi International Centre:
wall documentation and work tables



The *Digital Landscapes* Atelier



Encounters with living things_ Exhibition

The exhibition is a narrative. Words and images on fifteen *banners* present each school project and recount its phases and processes.

This narrative angle lets readers catch the inception, the spark of a project's beginning, and follow the geography of its journey.

The banners show this initial moment and what happens next, documenting children's capacity for re-elaborating the initial elements of information.

Children equip like explorers to verify and encounter the world, establishing relations with new things, and inventing new relations with things already seen, thanks to their empathetic, intuitive and poetic capacity for opening up new scenarios on the world around them. This theme interests them, and gives them a sort of explorer's responsibility, so they take up the task of resolving enigmas and trying out theories, and use this opportunity to present reflections they may have been frequenting for some time.

After this passage schools equip and lay out their spaces: with technologies, materials and thinking. The rich material of thinking crosses borders, to access associations of words and 'languages': from the start technologies, with their capacity for registering thoughts, connecting, and building fantastical hybrid environments, seem a natural prostheses for re-elaborating thoughts, when the subject of investigation, nature, already brings with it great complexity.

Nature, entangled in pixels, is immediately set free again, while the borders of thinking extend further and further as we get deeper into material. These are passages full of provisional solutions, with always-new points of view, maybe destined to change again, or transform over time.

The journey recounted by the exhibition is an extract, an iceberg emerging from each school's long process and many experiences. The page-banners tell us that this journey is not over, and that happy endings exist in each and every passage.



The optimism of daisies

GIANNI RODARI
infant-toddler centre

authors and protagonists:

children aged 2 to 3 years

Alessio, Alice, Carolina, Caterina, Daniele, Farida, Giacomo, Giulia,
Guido, Irene, Lorenzo, Lucia, Marco, Maria, Massimo, Matilde, Matteo,
Nina, Sara, Sofia, Sophia, Virginia, Wellington

teachers: Filomena Andriulo, Barbara Fabbi, Simona Manini,
Rita Sturloni

tutor teacher: Lucia Colla

Video Centre: Daniela Iotti

pedagogistas: Angela Barozzi, Maddalena Tedeschi

Children's research

There are some 'big' issues that also concern small children, engaged in trying to give meaning and order to the world.



Look how many. Alessio

Multitude and singularity

Delicate tenacious daisies, in great quantities, the same but different too, transform, grow, die, and are reborn, they express an interesting biological cycle and a sort of happy optimism when they make their timely reappearance in the grass.

Encounter

The children's attitudes towards the daisies lead to respect without rhetoric.



They're still closed because they are cold. Giulia

They dance when it is windy. Irene

This one is little. Nina

This one is pink. Alice

They are alive because they are standing up. Alessio

They dry off in the sun when they are wet. Maria

It touched me, it tickles! Alessia

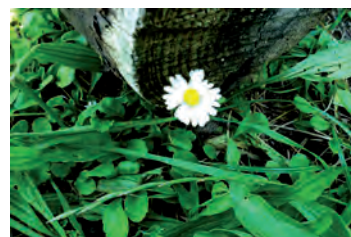


Photo by Lucia

Photo by Nina

Can I give the daisies to my mummy? Alessio

'Picked differently': contexts and tools

This desire of the children, to give the daisies, urges the adults to seek alternative solutions to picking daisies: paper frames, camera, video camera... to feed an empathy that creates respect.



The daisies are a little bit very tall and they dance. Maria

Butterfly-daisies

Real settings and digital settings: enrichment of imagination.

These ones are playing quietly, quietly, without making any noise... When they tickle each other they turn into butterflies and fly... I saw it once when it was dark. Virginia



We make it dark, we make it quiet, we make the magic. Alessio

*There's lots that's colourful! Virginia
I saw a purple butterfly and a green one! Maria*

Metamorphosis

Projected daisies undergo metamorphosis, the imagination transforming them into large and colourful living butterflies.



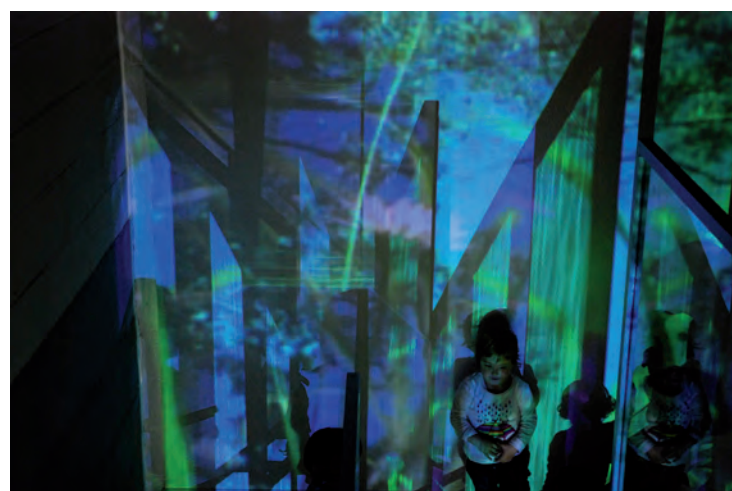
There, that thing has happened... Virginia



It has transformed into a butterfly. Virginia

Metamorphoses in drawings

Everything mixes, hybridises, changes and above all generates. This is what the children are courageously capable of suggesting.



It's the colours that transform it into a butterfly. Maria

My daisy. Virginia

I want to make it turn into a butterfly. Maria





Out walking with snails

ALICE
infant-toddler centre

authors and protagonists:

children aged 2,7 to 3,5 years

Alessandro, Alessia, Chiara O., Chiara P., Crhistian, Elijah, Federico, Flavio, Gabriella, Ginevra, Giovanni, Ilaria, Kristina, Luca, Mario, Nicole, Praise, Sofia, Tommaso

atelierista: Anna Orlandini

teachers: Antonella Campani, Silvana Brasile, Francesca Prandi, Giovanna Ruscitto

pedagogista: Deanna Margini

Encounters

On the lawn, a snail moves slowly, the children's eyes rest on her*.



She's creeping... but where is she going? Sofia
Out for a walk... Kristina

Getting closer

Out of a desire to observe and to know her, the snail is carried into the classroom for a few moments.



Returning to the habitat

The snail returns to the garden lawn, but remains close to the children's gaze.

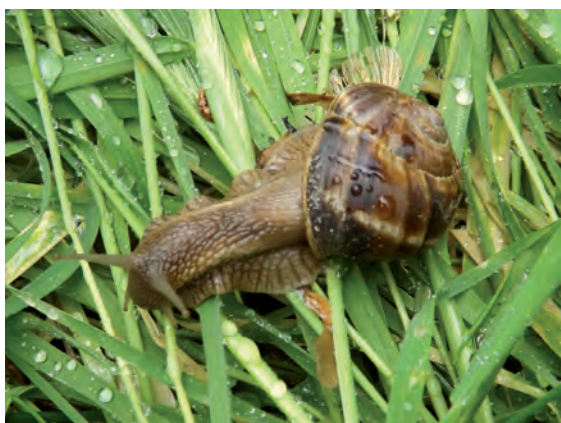
I want to go with her out into the garden. Then we can put her down to play with her friends. Sofia

The children, with their empathy and awareness, suggest a need for the snail to get back to her natural habitat.

New 'beautiful' habitats chosen and photographed by the children



Damp leaves



Fresh blades of grass



Salad for tasting

* The snail's gender is given by the female article used in Italian for snail, *la chiocciola*.

The force of an idea

And while they take photographs of her, they plan to build her a rich new setting, where she can also have fun. Fun and play are as necessary as finding food.

I'm doing a photography... with the snail... Chiara P.



We could make a roly-poly for the snails, so they can play together. Kristina
Like a ring-of-roses. Caterina



Settings for snails to play in



Drawn snails, the new friends of real snails



Feelers Chiara P.



Snail shell Federico