CREATING THE (SCHOOL'S) FUTURE.

IMAGINATION, PREDICTION AND ARGUMENTATIVE COMPETENCE

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This paper proposes notes and reflections on methodological strategies and qualitative outcomes of a teaching experiment that involved a class (5th year) of the primary school of the IC Galilei in Reggio Emilia. The work was carried out within a digitally augmented learning ecosystem capable of a) enabling synchronous and asynchronous interaction practices and b) facilitating co-operation and sharing at different levels of proximity (between teachers and students). In this context, efforts were made to enrich and develop pupils' argumentative competence by working with images and especially by prodding their predictive imagination. Therefore, taking the evolution of technologies as a projectual (and cultural) horizon within which to try to imagine a plausible and desirable future, and conceiving −like Vygotskij −the imagination in terms of a creative and combinatory behaviour, we asked the children to 'create' a probable future. In other words, we asked them to give shape to the school of the future, starting with an analysis of the mistakes and intuitions that a group of artists at the end of the 19th century were able to make in an attempt to predict the year 2000 that the protagonists of this action-research project did not experience. Final objective: to develop in the children an argumentative and linguistic structure capable of supporting a lesson aimed at citizenship in which the pupils themselves would then share their idea of integrating digital technologies at school. The results collected made it possible to positively assess a second edition of the training course, which will see the adoption of a device −McLuhan's Lost Tetrads− with which we will try to further encourage an exercise of imagination (and also of argumentation) capable of designing sustainable contexts and ecosystems (of learning and beyond).

PHENOMENOLOGY OF AN EMERGENCY

The main objective of this paper is to underline, in a peda-
gogical context, the heuristic value of the imaginative exer-
cise and its potential usefulness in enriching argumentative
competence. More precisely, we will report on a teaching ex-
periment conducted at the Loris Malaguzzi Primary School - IC
Galilei Reggio Emilia, carried out during the 2019-2020 school
year. This was an action-research project (Barbier, 1977) in
which the use of digital technology —as will be stressed later—
was conceived and managed, on the one hand, to increase the
space-time of sharing and comparison, and on the other —in
line with what Tim Berners-Lee said, recalling the aims he had
pursued in designing the World Wide Web— to "keep under
control the institutional memory of a project" (Isaacson, 2014,
p. 409). This last aspect is not negligible in the didactic econ-
omy of the experiment under examination, since it allowed
the children involved (coordinated by the teachers) to retrace,
once they had finished the experience, the ideational pro-
cesses in which they had been protagonists and, consequent-
ly, to produce metacognitive reflections on the work done.

The motivation that prompted us to work on the link be-
tween imagination and argumentative competence is to be
found in the educational (and cultural) emergency of freeing
argumentation from the narrower and more intuitive logical-
mathematical field (Cambi & Piscitelli 2003) to make it to all
effects a transversal competence. After all, this is also the di-
rection suggested by the OECD, which defines argumentation
skills in terms of "students' ability to apply their knowledge and
skills in key areas and to analyse, reason and communicate ef-
fectively while identifying, interpreting and solving problems
in different situations" (INVALSI, 2019, p. 15).

And even more supportive of the work done seemed to us
to be the "Council Recommendation" of 22 May 2018, which
even places functional alphabetic competence at the top of
the list of key competences. This is significantly described in
the aforementioned document as:

the ability to distinguish and use sources of different kinds, to search, collect and process information, to use aids, to formulate and express arguments in a convincing and contextually appropriate way, both orally and in writing (Gazzetta Ufficiale C 189, 2018, p. 8).

What is more, the "Recommendation" also states that a positive attitude towards this competence involves a willingness to engage in critical and constructive dialogue, an appreciation of aesthetic qualities and an interest in interacting with others (Gazzetta Ufficiale C 189, 2018, p. 8).

It is on the basis of these premises that the action-research work in question was conducted in a class group composed of 23 children (13 boys and 10 girls) and the languages spoken –besides, obviously, Italian– were 6: Chinese, Moldavian, Arabic, Portuguese, Yoruba (tribal - Nigeria) and Asante (tribal - Ghana).

IMAGINING THE FUTURE, BUT ALSO THE PAST

The starting point of the training course – as well as the pretext that allowed to set up the exercise of imagination of the pupils of Reggio Emilia– coincided with a reflection initiated in the classroom on digital technologies, on the impact they have (and may have) on society and in particular on school life. The aim of this dialectical discussion (coordinated by Stefano Moriggi) was first of all to investigate (and to prod) the pupils' awareness of the complex discontinuity that the adoption of digital devices in learning spaces could (and will) trigger.

At the same time, Giusi Grasselli, the class teacher, took care of the operational organisation of the project's spaces and times, and in particular of all the digital and analogue tools available to the children for research and documentation, as well as of preparing the Workspace for Education platform. As mentioned above, the setting up of a digitally augmented classroom setting (Moriggi & Pireddu, 2020) was conceived and realised following some of the objectives that

originally guided the conception and IT implementation of the World Wide Web. All this with the intention (explicitly shared with the children) of enabling a space-time of learning and interaction that goes beyond that allowed by the mere physicality of the classroom; and such as to enable active and cooperative work and research methodologies able to compensate for the criticalities and optimise the opportunities of the different levels of interpersonal proximity.

More concretely, the students had to learn to manage (and document) the moments of dialectical confrontation with Moriggi in the classroom, alternating with work phases –coordinated by Grasselli– of in-depth study and cooperative development (both in presence and at a distance). Moreover, the digitally augmented didactic ecosystem set up in this way allowed a continuous interaction between the class group and Moriggi (when he was not in the classroom), as well as guaranteeing a constant updating of the reflections started in the first meeting in presence and a continuous sharing of materials considered useful for the progress of the action-research.

Having said that, it is now a question of illustrating how this reflection on the impact of digital technologies could have triggered an imaginative exercise aimed at developing the class's argumentative competence. But this presupposes some clarification of the term imagination as understood here.

Particularly inspiring in this regard were the writings of Lev S. Vygotskij on imagination and creativity in childhood – and more specifically the identification in the behaviour of the human being by the Belarusian scholar of a "second type" of creative activity (in addition to the "reproductive" one): that is "the combining or creative one" (Vygotskij, 2010, p. 19) which, precisely, for the psychologist from Orša coincides with imagination. Vygotskij writes:

> if human activity were limited to reproducing what is old, man would be a being turned solely towards the past, capable of adapting to the future, only if this were a reproduction of the past. Creative activity is therefore what makes
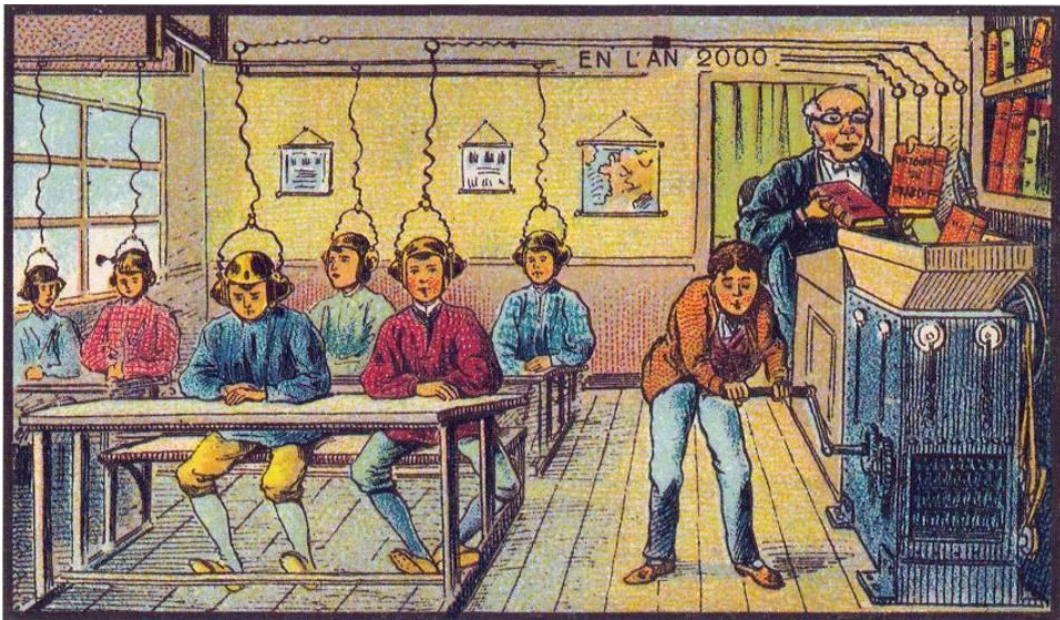
man a being turned towards the future, capable of shaping it and changing his present (Vygotskij, 2010, p. 19).

However, no less relevant for the structuring of the project under discussion was the consideration that immediately followed, in which the scholar pointed out that

imagination, as the foundation of all creative activity, manifests itself in all aspects of cultural life without exception, making artistic, scientific and technical creativity possible (Vygotskij, 2010, pp. 19,20).

Therefore, asking the children to imagine how the evolution of technologies could have changed the school and the learning scene, seemed to us to be an opportune planning horizon within which to direct their imaginative (creative-combinatory) effort from the outset.

In this case, the children would have to imagine the school of 2119, substantially replicating what Jean-Marc Côté and other artists did in 1899. On the occasion of the Universal Exhibition in Paris in 1900, they were given the task of predicting

Figure 1 At school it is an illustration belonging to the 87-part series "En l'An 2000" (In the Year 2000) depicting scenes of life in the future. First produced for the Universal Exhibition in Paris in 1900, they were printed as inserts for cigar boxes and then as postcards between 1899 and 1910. Science fiction writer Isaac Asimov discovered a series of them in the 1980s, publishing them in his non-fiction work Futuredays: A Nineteenth Century Vision of the Year 2000, Virgin Books, London, 1986.

At School

the future by making a series of postcards that could project those who would see them *En l'an 2000*.

A selection of these postcards –including the representation of the school in the year 2000 (see Figure 1)– was shared with the class (in the digital environments adopted) and carefully analysed by the working groups into which the children were organised.

And this for a series of interconnected reasons: 1) by analysing these representations, and in particular the mistakes made by the artists in their predictions, the children would have been able –as in fact happened– to understand the difficulty of the exercise that would soon involve them too; 2) the exercise in question should not have been, precisely, a free and fanciful interpretation of the time to come, but rather an attempt to anticipate events, arguing the probability and desirability of some scenarios compared to others. All this –as Simone Arcagni has recently written about George Herbert Wells' futurology– producing "an attentive and motivated observation that combines scientific expertise with a series of social notations" and that tries to "intercept those processes in progress that more than others seem to show privileged directions" (Arcagni, 2021, p. 11); 3) considering that in 2000 the children involved in the action-research were not yet born, the analysis of the above-mentioned postcards would have forced them not to remember, but to reconstruct (and therefore imagine), researching and arguing, what they could not see.

As Vygotskij again noted:

When [...] I try to imagine a future event, for example, life organised in a socialist way, or the remote past and the struggles of prehistoric man, in both cases I do more than reproduce impressions [...]. I have never actually seen either that past or that future; I can only have a representation of it, an image, a picture of my own (Vygotskij, 2010, p. 19).

And in this vein, adding his own commentary to that of the members of his working group, a child wrote in the

shared digital environment: "We cannot see things from the past with our eyes; you must have some imagination to understand the findings"[1].

THE LOGIC OF CREATIVITY

The analyses and reflections carried out in the first phase of the project contributed to preparing the class to face the future of the school as a problem (Andersson, 2018) to be tackled by trying to calibrate, in a planning logic, a predictive exercise able at the same time to identify plausible and desirable scenarios. And the fact that the work carried out so far has made the children more aware of the complexity of the exercise required of them seems to be quite evident from their own considerations – in which it will not be difficult to perceive some significant assonances with Vygotskij's reflections (not to mention Wells' futurology) from which we started.

Here are some of them: "One can imagine by taking one's cue from things that already exist. From the certainties we have. If you have to think about the future, you try to anchor yourself in the certainties of the present". And again: "We have created new things out of existing things".

If, on the one hand, the children understood that imagination in this sense requires a creative recombination of what we already know; on the other hand, the need for logical rigour (fully compatible with the creative impetus) to go hand in hand with a good knowledge of the tools and devices whose evolution is to be intuited did not escape their attention.

"In order to imagine" –wrote one child– "we had to think logically. Evolutions must be made on the basis of needs". And another added: "When you imagine the future, you have to know as much technology as there is. Usually, you never think of something from scratch".

In this phase of the project –as in the previous one– an attempt was made to maintain sufficient terminological rigour to avoid trivialising the issues and problems addressed. Not
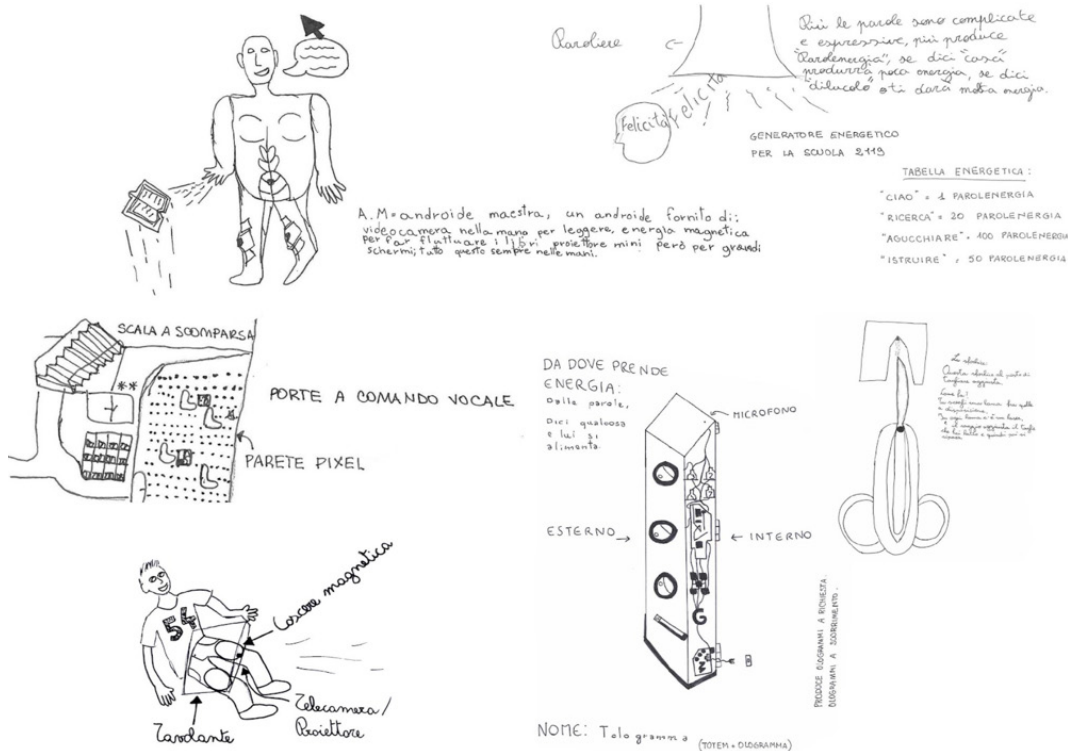
Figure 2 Graphic projects realised by the children of the fifth class of the Loris Malaguzzi Primary School of the IC Galilei of Reggio Emilia.

only that, but with a maieutic purpose, they were asked to give an account of each of their statements or imaginative impulses, sometimes relaunching the theme and bringing to their attention aporias not considered or critical points worthy of further attention. All with the aim of stimulating the creativity implicit in the zone of proximal development (Vygotskij, 1954). More specifically, it was our intention to systematically provoke "that continuous transition between the verbal level, the concrete and perceptual level of objects, and visual representation" that were significantly identified in the children's metaphorical processes (Cagliari & Giudici, 2021, p. 11) and that we found in the dynamics of (their) predictive imagination (precisely, as they themselves declared, "taking inspiration from things that already exist").

The word combinations with which they tried to conceptually translate their graphic projects were concrete and significant evidence of the combinatorial creativity with which their imagination tried to shape a school of the future that was both plausible and desirable. The drawings and captions that populate Figure 2 represent a selection of their projects that deserves some comment.

It seems appropriate to note from the outset their nonchalance in advancing future hypotheses that a subsequent phase of analysis and comparison would have made it possible to evaluate and select. For example, the idea of an 'android teacher' –which represented one of the first shared projects– would later be discarded in favour of a school in which the figure of the traditional teacher (even if technologically enhanced) seemed entirely pleonastic, not to say incompatible.

It was specifically a school in which active and cooperative participation in learning (already experienced in their teaching routines) would have to evolve to the point of contemplating a synergistic ecosystem in which knowledge could become a widespread experience in space and time capable of involving the school structure itself. As we read in the digitised notes of one of the working groups on their new idea of a school:

> Lessons will take place among children, that is, without teachers: thanks to a 'bionic' nourishment that retains the children's comments (as in the functioning of photosynthesis […]) and for each cycle of pupils it issues them according to the class […]. In this way the school learns together with the children.

With regard to the aforementioned word combinations, it seems pertinent to focus attention on the *Tologramma* (a totem that transforms voice commands into holograms) and the *Tavolante* (a tablet capable of floating in a vacuum): two examples in which the children worked, arguing the drawings with a combination of words in order to identify a meaningful conceptual compromise between the form and function of the devices in question. In other words, by mak-

ing explicit their principle of sufficient reason, i.e. their future usefulness/sustainability.

And even more significant from the point of view of future utility/sustainability (and therefore of linguistic-conceptual elaboration) is the conception of the *Paroliere*. It is a device that produces 'word-energy' in proportion to the complexity and richness of the meanings of the words it absorbs. The meaningfulness of the words spoken by the children generates the 'lifeblood' that satisfies the energy needs of the learning eco-system. This, evidently, finds its design coherence with the idea of the school described above in which the same school building imagined by the children learns with the students, holding and releasing their comments in such a way as to ensure a balanced sharing of knowledge and skills.

This work on words therefore led the various groups to converge on a project in which the very concept of sustainability found (also from an argumentative point of view) a virtuous declination in a school structure which, without impacting on the environment, would at the same time allow an active, involving and responsible learning experience (given that the production of energy needed by the institute depended on the attention with which the children –no longer needing the teacher– undertook to find the 'right words' to say, and therefore acknowledge and respect, the complexity of the world).

THE 'REDISCOVERED' TETRADS

The conclusion of the project coincided with a conference 'for adults' on the future of technologies (in schools), which was organised by the children of class 5ª A at the Loris Malaguzzi International Centre (Reggio Emilia). This epilogue, declared and shared since the beginning of the project, represented a further stimulus for the working groups to produce an argumentative/expositive strategy able to support (also publicly) the final product of their imagination

exercise. This event, as well as sharing of the work carried out, represented for the class (stimulated by Moriggi and the questions from the audience) a precious moment to take stock of their learning path – and therefore to find the most appropriate words to give an account of their experience and their projects. And the following sentences are a brief but significant selection of the reflections matured and shared during the didactic experimentation that the children decided to submit, commenting on them, to the attention of their parents and of the other adults who attended the final conference: "We learnt some new words"; "I learnt a bit more to express myself in everything I thought"; "I felt free"; "Maybe because we are growing up".

In order to assess the different levels of exercise of argumentative competence in terms of acted knowledge (Wiggins, 1993), we set up observation grids to record each student's data according to the following parameters: personal autonomy, relationship with adults and peers, participation,

Figure 3 Graphical representation of a tetrad based on the original model developed by M. & E. McLuhan.

ENHANCES

REVERSES

MEDIUM

RETRIEVES

OBSOLESCES
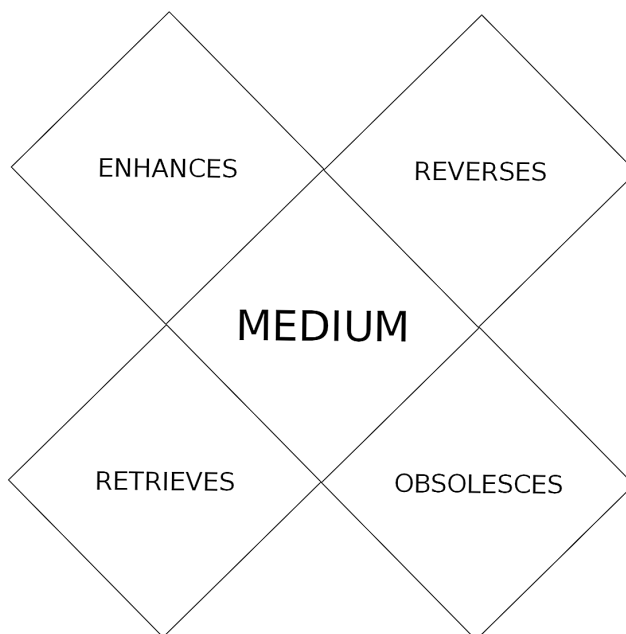
individual responsibility, flexibility and awareness. The rubrics of competence, on the other hand, focused on indicators of levels of mastery: that is, performance provided, cognitive and operational processes implemented, attitude towards the experience. The final results show high average levels, which meet the parameters that the OECD advocates for lifelong learning (OECD Skills Outlook, 2021).

Specifically, out of 23, the level of full competence was reached by 14 children and the other 9 were assessed as being in the medium-high range. The results collected –and above all the conceptual/argumentative elaboration developed by the children around the concept of sustainability (relating both to learning and to the environment)– led to the conception of an evolution of the project (and therefore a second edition planned for the 2022-2023 school year) that will integrate a projectual device capable of further articulating the ecological imagination (and therefore the argumentative competence) of the subjects involved.

We are alluding here to Marshall (and Eric) McLuhan's "Lost Tedrads" (McLuhan &. McLuhan, 2019). In order to manage this tool, it is necessary first of all to share the Canadian scholar's idea that every medium –and for McLuhan, every object or concept that (re)mediates our experience of the world can be called a medium– should be understood first and foremost as the set of its practical consequences, the practices that it inaugurates and makes possible (Di Martino, 1998, p. 32). Within this conceptual horizon McLuhan (and his son) came to formulate the "laws of the media" – the tetrad, in fact (McLuhan & McLuhan, 2019, p. 9). Each tetrad consists of four questions (see Figure 3), the answers to which should enable us to reconstruct (and thus imagine) the socio-cultural context (or, in other words, the ecosystem) that a given medium could (or will) contribute to develop.

What does it 'enhance'? What does it retrieve? If taken to extremes, what does it 'reverse'? And what does it make obsolesce?

The very graphic arrangement of the laws is designed to facilitate a synoptic compilation of the tetrad. That is to say,

to facilitate "a cross-reading and analogical" such as to favour a network of connections based on a relationship that on the one hand exploits "the structurally metaphorical value of language" (Lamberti, 2000, p. 165) and, on the other hand, restores the complexity and dynamism of the contexts made possible by the interaction with the medium under examination.

Not to mention the ideational propulsion that could be generated by the possibility –envisaged by McLuhan himself– of comparing alternative, and why not dissonant, compilations of tetrads built around the same medium (the school, in this case). Obviously, precipitating the device in question (the school) within that digitally augmented space-time in which the children of Reggio Emilia have tried to 'create' the future of learning.

NOTES

1 The children's observations –reported throughout the text in inverted commas and in anonymous form– were selected from those available in the documentation collected as they were more representative of the ideas and considerations widely shared that emerged both in the research and in-depth study phases and in those of comparison (both in presence and at a distance).

REFERENCES

Andersson, I. (2018). *The Future of the World. Futurology. Futurists and the Struggle for the Post-Cold War Imagination.* Oxford, UK: Oxford University Press.

Arcagni, S. (2021). Wells futurologo. In H.G. Wells, *La scoperta del futuro.* Roma, IT: Luiss University Press.

Barbier, R. (1977). *La recherche-action dans l'institution éducative.* Paris, FR: Gauthier-Villars.

Cagliari P., Giudici C. (2022), Le ragioni di una ricerca e di una mostra sui processi metaforici nei bambini 0/6 anni. In E. Corte, S. De Poi, C. Giudici, V. Vecchi & A. Contini (EDS.), *Un pensiero in festa. Le metafore visive nei processi di apprendimento dei bambini*, Reggio Emilia, IT: Reggio Children, pp. 10-13.

Cambi, F., & Piscitelli, M. (2003) *Argomentare attraverso i testi. Una frontiera della formazione logica per lo sviluppo delle abilità linguistiche.* Pisa, IT: Edizioni Plus.

Di Martino, C. (1998). *Il medium e le pratiche.* Milano, IT: Jaca Book.

Gazzetta Ufficiale dell'Unione Europea (C 189 - del 22 maggio 2018). https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:3201 8H0604(01)&from=EN.

INVALSI (2019). Indagine OCSE PISA 2018. I risultati degli studenti italiani in scienze matematica e lettura, https://www.cnos-scuola.it/sites/default/files/01_Rapporto_Pisa,%202019.pdf.

Isaacson, W. (2014). *Gli innovatori. Storia di chi ha preceduto e accompagnato Steve Jobs nella rivoluzione digitale.* (Trans. S. Crimi, M.Fusari). Milano, IT: Bruno Mondadori.

Lamberti, E. (2000). *Marshall McLuhan.* Milano, IT: Bruno Mondadori.

McLuhan, M. &. McLuhan, E. (2019). *Le tetradi perdute di Marshall McLuhan.* (Trans. F. Deotto) Milano, IT: il Saggiatore.

Moriggi, S. & Pireddu, M. (2021). Multidimensional Learning. The Space-Time of Didactics / Apprendimenti multidimensionali. Lo spazio-tempo della didattica. *Qtimes. Journal of Education Technology and Social Studies*, Anno III, n° 2, pp. 221-237.

OECD (2021). Italy Country Note - Skills Outlook 2021: Learning for Life, OECD, Paris, https://www.oecd.org/italy/Skills-Outlook-Italy-IT.pdf.

Vigotskij, L.S. (1954). *Pensiero e Linguaggio.* (Massucco Costa, A. Ed.). Firenze, IT: Giunti Barbera. (Original work published 1934)

Vigotskij, L.S. (2010). *Immaginazione e creatività nell'età infantile.* (Trans. A. Villa, R. Platone). Roma, IT: Editori Riuniti University Press (original work published 1930).

Wiggins, G. (1993). *Assessing student performance: Exploring the Purpose and Limits of Testing.* San Francisco, CA: JosseyBass.