JOURNAL OF E-LEARNING AND KNOWLEDGE SOCIETY
Vol. 17, No. 3 (2021), pp. 43-49

INVITED PAPER

Next Stop Perpetual Beta: notes for an ethics of design in digitally augmented learning contexts

Stefano Moriggi[a,1]

[a]*University of Milano Bicocca, "Riccardo Massa" Department of Human Sciences for Education – Milan (Italy)*

(published: 31/12/2021)

Abstract

Not even the pandemic period – which in many ways made necessary the use of networked devices – has contributed to trigger a reflection able to conceive and manage the digital beyond the opportunity/limitation represented by the remote connection. In the light of this awareness, this contribution will try to highlight some epistemological premises in order to outline a conceptual and operational context within which to make more intelligible the complexity of our interaction with digital technologies. Consequently, we will proceed to outline a design horizon within which to develop pedagogical perspectives and education approaches in which digital technology could effectively contribute to reshaping and enriching the learning scenario. More specifically, by sharing the main goals and some of the decisive phases of the project design "Briciole di Futuro" ("Crumbs of the Future") – carried out during the 2019/2020 school year in a class (fifth year) of the primary school of the IC Galilei in Reggio Emilia – we will try to highlight the opportunity to identify in digital technology a coherent extension and a creative expression of that cooperative and anti-authoritarian matrix of the scientific community. The spatio-temporal prerogatives of a digitally augmented classroom setting will be also illustrated, as well as the methodological strategies selected in order to facilitate, in the multiple types of interactions thus made possible among the children (and with the teachers), a dialectical experience and an argumentative habit in order to achieve, in this case, a shared co-design of the school of the future (year 2119).

KEYWORDS: Medium, Message, Hypothesis/Prediction, Cooperation, Networking, Digitally Augmented Learning.

DOI
https://doi.org/10.20368/1971-8829/1135593

CITE AS
Moriggi, S. (2021). Next Stop Perpetual Beta: notes for an ethics of design in digitally augmented learning contexts. *Journal of e-Learning and Knowledge Society*, *17*(3), 43-49. https://doi.org/10.20368/1971-8829/1135593

1. Digital as "message"

"We have entered the digital age. And the digital age has entered us" (Richtin, 2010, p. XIII). The effective incipit with which Fred Richtin, in his *After Photography*, sets out to investigate the future of images and the destiny that will await photographic art and technique in the era of the digital revolution is an essential premise for any reflection that really wants to come to terms with the impact produced by the pervasiveness of digital devices. However, because of reasons that we will try to investigate here, there is a difficulty – not to say a widespread resistance – to translate this awareness into an operational competence capable of metabolising the cultural discontinuity triggered at different levels by technological evolution.

Or, in Richtin's words:

[1] corresponding author-email: stefano.moriggi@unimib.it – address: Piazza Ateneo Nuovo, 1, 20126, Milano (Italy)

> *"we are struggling to reinvent the media in the form of what is essentially a marketing term, the 'digital revolution', and we dare not admit in this turbulent age that we are in fact reinventing ourselves" (Richtin, 2009, p. XV).*

This tendency has recently become evident also in the more circumscribed debate on the use of digital technologies for educational purposes. From this point of view, it does not seem too far-fetched to reinterpret the reduction of the reflection on the potential of digital technology in learning contexts in terms of the opportunities and limitations of the information technology with which, in the months of lockdown, it was possible to guarantee the continuity of distance learning.

What has hindered the triggering of one long argument (Mayr, 1994) – which could/should have started well before the pandemic – able to shed light on the need to "reinvent" school?

What has so far prevented us from initiating the appropriate gestalt switch useful to perceive, imagine, and manage, within school (but not only), the consequences of a massive use of digital technology, without reducing the cultural evolution of a context to a mere question of updating the devices and skills of the actors of that scene?

Inevitably, a plausible answer to these questions will have to address – and this is the first goal of this paper – the complexity of our relationship with technologies, freeing it from the dialectic of perspectives, more or less ideological, which variously interpret a hypothetical idea of virtuous synthesis between use and abuse.

The theoretical and research hypothesis that we intend to share here – and at the same time put to the test – moves precisely in the direction of unveiling what a (merely) instrumental approach to technologies cannot reveal. More precisely, we are referring to the constitutive and restructuring function of a given medium (Di Martino, 1998, p. 16), which we will try to put forward in its specificity by prolonging the genealogical exercise that engaged McLuhan in his effort to reconstruct the ways in which the forms of experience and mental point of view (and expression) have been modified first by the phonetic alphabet and then by the press (McLuhan, 1962, p. 22) – and then by the media that would follow.

But this kind of exercise calls for a subversion of planes in the analysis of a media phenomenon, a rethinking of priorities that allows us to focus first and foremost on the action of the media as such rather than on the contents they convey (McLuhan, 1982, p. 40). The original and constitutive function of the media should therefore be understood and pragmatically represented in its formative power, seeking to bring out the activities it inaugurates, the behaviours it makes possible, the environments and contexts to which it gives form and meaning.

While this opens up an ecological approach to the study of our interactions with technologies, it also takes the form of a design ethic that is desirable in educational settings in order to try to decipher and responsibly and creatively manage the digital "message" – or rather its form – on the learning scene.

Moreover, the historical coincidence of living, even within schools, the time of discontinuity generated by the disruptive *novitas* of digital technology could represent a prospective opportunity. If, actually, as mentioned above, the most intuitive and widespread strategy tends to trap the unprecedented in the categories of the traditional education (consequently reducing the "new media" to mere tools with which to replicate in "innovative" ways cognitive styles and relational practices produced by interactions with other media); on the other hand, this disorientation with respect to a desiderable media education could: a) represent the privileged point of view from which to return to analyse with the necessary detachment (a sort of Brechtian *verfremdung*) a cultural (and therefore also technological) inheritance metabolized to the point of no longer being perceivable as such; b) predispose, more easily, to the radical awareness from which we started by sharing Richtin's considerations.

2. Learning beyond communication

On the basis of what has been observed, it is now a question of indicating one of the possible strategies through which to intercept the digital "message" in order to show its potential interpretations/declinations in teaching. This will also be done through the description of some of the salient phases of an educational path actually implemented (school year 2019/2020) in the fifth grade of the primary school of IC Galilei.

About the case-study under examination, we will underline the methodological approaches and the spatial-temporal coordinates on the basis of which we have tried, in the direction of the design ethos outlined above, to operationally acknowledge the formative/transformative power of the digital medium. All this in order to reach an educational proposal able to intercept and develop – as we will see in the next paragraph – at least some of those expressive potentialities that induced Loris Malaguzzi to define the child as "unwieldy". The same child that, according to the *pedagogista* from Reggio Emilia, would have imposed a paradigm shift and would also have triggered a series of consequences of no small importance not only on the levels of psychology and pedagogy, but on the same ways of interpreting life and inter- and intrapersonal relationships as well as with knowledge and cultures (Edwards, Gandini & Forman, 2017, p. 56).

In an attempt to take up the challenge launched (and at the time won) by Malaguzzi, "Briciole di Futuro" (Crumbs of the Future) (this is the name – chosen by one of the pupils - of the instructional design) has tried to make the class experience the logic and dynamics which,

in many ways, have made digital technology possible and necessary in the various phases of its historical evolution.
In more explicit terms, the main goal of designing and conducting this educational pathway (conceived and implemented by myself in collaboration with Giuseppina Grasselli, the teacher in the class involved) was to "immerse" the children in the logic of the digital medium.
It has been a question of enabling them to (inter)act within a digitally augmented context, making them reflect at the same time on its own medial specificity, as well as on the skills necessary to "inhabit" it in a meaningful way. And this, to put it even more explicitly by paraphrasing once more McLuhan's words, corresponds to an attempt to facilitate an experience of the form of the digital, trying to avoid the linguistic and conceptual misunderstanding that considers it, still today, too often reduced – even in educational activities – to a "communication tool" [to underline this equivocal perception of the media (and not only of the digital) we refer, for example, to the frequent and paradoxical (editorial) italian tendency to translate precisely Marshall McLuhan's *Understanding Media* as "Gli strumenti del comunicare" (The tools for communication)].
Therefore, already in the fine tuning phase, we worked first of all on some articles, texts and testimonies of researchers who have been protagonists in the evolution of computer networks. The aim was to gather useful clues (first and foremost for us, the trainers) in their goals, as well as in the strategies put in place to achieve them, in order to better calibrate an educational design functional – as we said – to "stage" the digital as medium (that is, as "message").
And if somewhere else (Ferri & Moriggi, 2018, pp. 49-59), an attempt has been made to underline the irreducibility of networks in terms of instruments for communicating (and connecting) – trying at the same time to highlight the internal and constituent dynamics of the scientific community itself as it has been structured over time in the logic of the implementations those networks – on this occasion, we have rather concentrated on how the very concept of communication has been operationally understood by those "network builders" in terms of a sharing aimed at a quantitative and qualitative increase in cooperation.

We will therefore report, by way of example, some of the textual passages that have mainly shaped our educational pathway. In the next paragraph, they will be shared, but proceeding backwards with respect to the chronological order, just to further underline how and how much the attention to the development of (technological) supports aimed at optimising and enriching sharing – and therefore cooperation – has not been a recent acquisition, but a regulatory idea whose origin is rather to be found in the same constitutive characteristics of modern (and contemporary) scientific knowledge: in its own being correctable as controllable and controllable as public – that is, shared.

3. The historical and epistemological premises for designing (the) digital

We shall therefore begin by considering some of the strategies that guided Tim Berners-Lee in the design of the World Wide Web from the above perspective. In a book written in 2000, *a posteriori* he remembered paying close attention to the cognitive style of the physicists (the community in which Berners-Lee worked as a computer scientist at CERN in Geneva in the 1980s). In fact he explained that:

> *"one of the beautiful things about physics is its ongoing quest to find simple rules that describe the behaviour of very small, simple objects. Once found these rules can often be scaled up to describe the behaviour of monumental systems in the real world" (Berners-Lee 2000, pp. 35-36).*

He then went on to point out, by analogy, that:

> *"if the rules governing hypertext links between servers and browsers stay simple, then our web of few documents could grow to a global web" (Berners-Lee, 2000, p. 36).*

However, the British scholar did not neglect to point out the following:

> *"what was often difficult for people [more than for physicists] to understand about the design was that there was nothing else beyond URIs, HTTP, and HTML. There was no central computer 'controlling' the web, [...] not even an organisation anywhere that 'ran' the Web" (Berners-Lee, 2000).*

And it is precisely this disorientation resulting from the awareness of being within an a-centralised system (Petitot, 1981, p. 889) that corresponds – also in an educational context – to the realisation that in such circumstances learning (as well as thinking) becomes above all a question of orientation (Kant 1996, p. 47). This context is becoming even more complex to manage from the point of view of orientation if we also take into account what Berners-Lee did not hesitate to define the fundamental principle behind the Web (Berners-Lee, 2000, p. 37). That is, the possibility for Web users to make available – in the sense of sharing in a reticular and dynamic context – texts, graphics, sounds or videos, by building new links to other already shared contents. This, as the computer scientist (graduated in physics) observed, was a substantially new practice, and not without consequences.

After all,

> *"getting people to put data on the Web often was a question of getting them to change perspective, from thinking of the user's access to it not as interaction with, say, an on-line library system, but as a navigation though a set of virtual pages in some abstract space" (Berners-Lee, 2000).*

It is just this change of perspective highlighted by Berner-Lee that finds a pedagogical correspondence in that gestalt switch that was hoped for above as a cultural strategy aimed at a plausible integration of digital in school contexts.

And it is precisely with a "link" to the theme of the library and its future that, here, we will try to further highlight – or from other perspectives – some of the issues underlying the culture of networks which have proved decisive for the development of our pathway. In this specific case, the "link" in question refers to Joseph C. R. Licklider's *Libraries of the Futures*.

In 1965 the St. Louis (Missouri) scholar wondered, among other things, about the challenges that a library would have to face in the 21st century. In this specific thematic context, he articulated his idea of the interaction between human beings and technologies and proposed the need for a new technological support that would allow a different way of sharing and (therefore) managing information.

But let us proceed step by step in the reconstruction of his reasoning as regards, in particular, the aspects that proved useful and functional in designing of "Crumbs of the Future".

First of all, Licklider in *Libraries of the Futures* was keen to point out that, from his point of view, even if we use the helpful expression "man-machine interaction", we must bear in mind that it is

> *"an abbreviation and that the corpus of knowledge is a coordinated partner of human beings and computers" (Licklider 1965, p. 90).*

This is not the place to dwell on the details of the "man-computer symbiosis" (Licklider, 1960) theorised by "Lick"; but it seems however relevant to underline at least his explicit reference to the importance of the *corpus* of knowledge and – as we shall see – of its structure in order to reach a definition capable of satisfactorily restoring the complexity with which the theme of our interaction with technologies deserves to be addressed.

His aim was in fact to restructure the *corpus* – working precisely on the possible future of the library as a system for the conservation, organisation and retrieval of knowledge – in such a way as to encourage the more creative dimension of thought. To this end, as early as 1957, he undertook to compile a register in order to analyse, quantitatively, what kind of activities he was engaged in during his working day. And thus trying to assess the actual impact of this use of his time on his research activity. The results of this survey were discouraging: only 15% of his time was devoted to thinking, the remaining 85% to preliminary or support activities (Licklider, 1960, p. 6).

It was on the basis of such considerations that he imagined a "man-machine thinking system" based on an appropriate distribution of roles. One would have to assign the human being to what he does best and the machine to what it does best (Licklider, 1957, p. 1). An apparently banal consideration, but one that in reality sheds light on the declared need to overcome the book in the design of functional support for a rational and creative management of the available information.

It was therefore a question of going beyond the book-technology in the direction of a device that would make it easy to transmit information without transporting material (Licklider 1965, p. 24).

It is in this direction that Licklider predicted the future of libraries in the realisation of procognitive systems able to promote and facilitate the acquisition, organisation and use of knowledge (Licklider, 1965, pp. 6, 21) – and not only the flow of communication.

It was in this way that he arrived at the idea of redefining (informatically) the *corpus* of knowledge in terms of a "relational network" structure: that is, a structure composed of entities, relations and properties connected by "multi-topic" relations in a "network of relevance" (Licklider, 1965, pp. 82-83). It was in this way that Licklider sought to improve his status as a researcher, and thus also that of "the very creative scientists and engineers who spend most of their time doing essentially clerical work (Licklider, 1957, p. 2).

On closer inspection, "Lick" was therefore moving in the direction of designing and implementing an environment (a dynamic and diffuse *corpus*) that would require and allow at the same time a cognitive experience capable of reproducing and enhancing the logic of sharing (and cooperation) constitutive of the scientific community itself.

This effort becomes even more evident in an article written in 1978 together with his colleague Albert Vezza and dedicated to the analysis of thirty cases of application of information networks in different contexts (among which the educational one). On that occasion, taking into account the political, social and economic consequences of such applications, the two scientists wrote the following:

> *"One of the major motivations for networking is the need to share resources. [...]. The design of a network can make it easier or more difficult to share resources and thus directly influence the amount of resource sharing that will occur" (Licklider & Vezza 1978, p. 1330).*

It is therefore on the basis of the intuitions and goals – here reproduced in brief – of two undisputed protagonists of the evolution of computer networks that we have tried to trace the "message" of digital technology, making it emerge from the pages of authors who embody and symbolise two historically and conceptually relevant junctions in the development of the technologies under examination.

Without therefore thinking to reduce the investigation of the digital as a "form" to their research work and theoretical perspectives, the reflections of Licklider and Berners-Lee were considered sufficiently representative. At least to start, with the instructional design "Crumbs of the Future", an experience of education that could find one of the plausible strategies to nurture an epistemologically correct and functional approach to the integration of digital technologies in educational contexts in the recovery of the cultural matrices of IT projects and devices - and therefore also through a careful re-reading of the founding texts of Information Technology.

4. The future of school in predictive "crumbs"

At this point it is a question of describing how we have tried to put into practice what has been shared so far. This will be done first of all through an illustration of the instructional design, which will correspond to the explanation of the goals set for the students by underlining the activities envisaged, as well as the classroom setting which has been able to host and at the same time make sustainable this research-action.

But firstly, the description of the group of students involved is preliminary to all this. It was – as already mentioned – a fifth grade class (Galilei primary school of Reggio Emilia) consisting of 23 children (10 girls and 13 boys). Within this group the languages spoken – in addition to Italian – were 6: Chinese, Moldavian, Arabic, Portuguese, Yoruba (Nigeria) and Asante (Ghana).

These children were asked to reflect on technologies – starting with those they used in their usual school activities. And the need to generate a proactive and cooperative learning experience that would intercept the digital "message", at least in the aspects mentioned above, took shape in the request addressed to the class group to try to design the school of the future (year 2119).

This working hypothesis was developed into the groove of a didactics of prediction (Rivoltella, 2014, p. 11) with the intention of stimulating a bold imaginative effort within the class – it would have been a question of imagining the school "in a hundred years" – but tying the formulation of hypotheses to two criteria: reliability and desirability.

In other words, the children were essentially asked to produce predictive inferences which, in their eyes, represented likely (in this sense *reliable*) anticipations of how learning environments and methodologies would evolve over the course of a century. Another condition set for the class was that, as far as possible, the various hypotheses/predictions produced by the various working groups into which the children had been organized should converge into a single idea/design for the school of 2119.

This final result would be illustrated to the parents and, more generally, to the citizens of Reggio Emilia at the public meeting that would mark the conclusion of the education path.

This last constraint added to the internal cooperative dimension of each group a further level of dialectical confrontation and collaboration aimed at committing the individual students of the various groups (and also each group of the class) to estimate – precisely in terms of reliability and desirability – the best of the available hypotheses. All this in the awareness that the final proposal could also have emerged from creative crasis between the different ideas of the groups.

From an organisational point of view, the set of instruments (digital and analogue) available to the children for their usual research and documentation activities was "re-designed" in order to build and optimise that network of relations that would have made it possible to enhance quantitatively and qualitatively the space-time of their research community.

In this direction, in fact, the Workspace for Education platform was set up for the networking of shared spaces for archiving, tracking and comparison (video calls, chats, team repositories). All of this was functional for managing and documenting phases of dialectical interaction both in the presence and at a distance, depending on the case and the moment. And here we mean interactions between students in the same group, between different groups, between the class and their teacher who coordinated the activities and monitored the processes in the everyday life of the school.

Lastly, a classroom setting conceived in this way – and, in particular, a socio-constructivist use of Classroom – made it possible to continuously exchange and share information, multimedia contents and reflections between the class and myself even on days and at times when we all were not physically presence in the classroom.

And it was precisely the children's experimentation with the cooperative potential of the digital devices in the classroom that prompted them to produce reflections similar to those selected below from a classroom discussion with their teacher.

Eva: "Classroom was for commenting on ideas". Costantino specified: "To consult each other". Alessia added: "To reconsider". Eva replied again: "To compare notes. We produced digital documents. And Costantino added: "And many times we went to revise, to get to the details". And in the end Eva even came up with a definition: "Classroom is a partner" (exactly the same word used by Licklider to define the *corpus* of knowledge).

It is therefore within the framework of a multicode learning ecosystem thus conceived (Moriggi & Pireddu, 2021, pp. 231-235) that the context design was articulated; initiated however by an activity that was in many ways preparatory to the complicated exercise of prediction.

More specifically, the children were asked to examine a series of postcards entitled *En l'An 2000*, which Jean-Marc Côté and other artists had been commissioned to produce in 1899 for the 1900 Universal Exhibition in Paris. The class was supposed to evaluate the reliability (and also the desirability) of those nineteenth century hypotheses about the future of society (including schools). The task to which they were called was actually less easy than it might seem. After all, the children in that class were not yet born in the year 2000, which is why, in addition to the awareness of having to find, at least in some cases, the historical documentation necessary to evaluate the work of those illustrators, the class group also came to the enlightening conclusion that Lorenzo (one of the pupils) formulated with the following words: "We cannot see things from the past with our eyes and we must have a little imagination even to understand historical findings".

As far as the prediction exercise is concerned their assessments of the many "errors" committed by Côté and his colleagues in the prefiguration of the year 2000 represented, however, a precious heritage from which to extrapolate methodological indications useful for managing and overcoming the initial embarrassment into which the formless spectre of the future threw them (Rivoltella 2014, pp. 64-66).

From this point of view, the following considerations, shared in a discussion with their teacher on how to proceed in the formulation of reliable (as well as desirable) hypotheses, should be read.

Daniele: "It's very difficult to imagine something that doesn't exist". Hanane: "You can imagine from things that already exist. From the certainties we have now. If you have to think about the future, you try to anchor yourself in the certainty of the present". Beatrice: "You never think of something from scratch".

The search for an "anchorage" to the present (as well as to the past of the illustrations they had to analyse) therefore had a twofold value for the children: on the one hand, it enabled them to anaesthetise, at least partially, the disorientation produced by the difficulty of thinking about non-existing things; on the other, it represented an inescapable starting point from which to imagine a plausible and desirable future for the school – experiencing each time the difficulty of choosing between two or more competing hypotheses/predictions.

Indeed, it is precisely in the proliferation of competing hypotheses about the future – fuelled in this educational path also by the cultural heterogeneity of the class group involved – that the children concretely perceived and cooperatively managed the learning experience in terms of a (qualitative) estimate of probability. That is, in terms of becoming aware of the fact that learning means, above all, learning (and eventually improving) the degree of uncertainty of our "predictive crumbs" about the world.

Therefore, it was precisely by exploiting the added value of the continuous and repeated exchange with their classmates in the spatial and temporal modalities allowed by the educational context designed *ad hoc*, that the class group produced a dynamic and operational representation of those prerogatives of the scientific community which – as mentioned above – give form (and therefore content) to the digital "message".

And this representation will be all the more faithful if it succeeds in making the computer concept of *perpetual beta* the stylistic hallmark of digitally augmented cooperation. This alludes to the principle according to which no contribution shared within a group can (and should) be considered as authoritative because there is no definitive version of it at all (Ryan, 2010, p.110).

It is precisely in this co-incidence between the "test version" and the "production version" of a piece of software that the IT world interprets and puts to work the craft and cooperative approach to knowledge typical of the technical-scientific enterprise.

It is precisely this conceptual and stylistic co-incidence that the design of this project has asymptotically aimed at in order to better grasp the (potentially) educational scope of the digital "message". And it was precisely by engaging in this kind of logic of the uncertain (de Finetti, 1989) that the children together challenged the unknown with their predictive crumbs.

References

Berners-Lee T. (2000), Weaving the Web. The Original Design and the Ultimate Destiny of the World Wide Web, New York, Harper.

de Finetti B. (1989), La logica dell'incerto, Milano, Mondadori.

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

Edwards C., Gandini L., Forman G. (2017), I cento linguaggi dei bambini. L'approccio di Reggio Emilia all'educazione dell'infanzia, Parma, Edizioni Junior.

Ferri P., Moriggi S. (2018), A scuola con le tecnologie. Manuale di didattica digitalmente aumentata, Milano, Mondadori.

Kant I. (1996), Che cosa significa orientarsi nel pensiero, Milano, Adeplhi.

Licklider J.C.R., Vezza, A. (1978), Application of Information Networks, Proceedings of the IEEE, 66 (11), pp. 1330-1346.

Licklider J.C.R. (1960), Man Computer Symbiosis, Transactions on Human Factors in Electronics, HFE-1 (1), pp. 4–11.

Licklider J.C.R (1957), The Truly Sage System or Toward a Man-Machine System for Thinking, Licklider Paper Box 6, Folder 1957 (b), pp. 1-2.

Mayr, E. (1993), One Long Argument. Charles Darwin and the Genesis of Modern Evolutionary Thought, Cambridge MA, Harvard University Press.

McLuhan M. (1982), Dall'occhio all'orecchio, Roma, Armando.

McLuhan M. (1962), The Gutemberg Galaxy. The Making of Typographic Man, Toronto, Toronto University Press.

Moriggi S., Pireddu M. (2021), Apprendimenti multidimensionali. Lo spazio-tempo della didattica, QTimes, XIII, 2, pp. 221-237.

Petitot J. (1982), Centrato/Acentrato, Enciclopedia Einaudi, II, Torino, Einaudi, pp. 884-954.

Rivoltella P.C. (2014), La previsione. Neuroscienze, apprendimento, didattica, Brescia, Editrice La Scuola.

Ryan J. (2010), A History of the Internet and the digital future, London, Reaktion Books Ltd.

Rychtin, F. (2009), After Photography, New York, Norton.