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METAVERSE AND NEW EDUCATIONAL AND INCLUSIVE PARADIGM. SOME REFLEXIONS.

METAVERSO E NUOVO PARADIGMA EDUCATIVO E INCLUSIVO. ALCUNE RIFLESSIONI.

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Abstract

This work represents a first research hypothesis on the impact of the Metaverse in education. Digital and new technologies, after the Covid 19 Pandemic, have accelerated the birth of a new educational paradigm in the Italian schools. Distance learning, integrated digital teaching, artificial intelligence have meaningfully influenced our classrooms, promoting new scientific possibilities to build a new model of school. The digital competence of students, teachers and parents has increasingly the focal meaning of a new school. How it will be the Italian school in respect to this educational paradigm and what will be the best practices promoted by NRRP? In this paper I will try to define some solutions that schools could adopt to make their classrooms more digital and inclusive, also experimenting with new spaces and learning environments through the Metaverse.

Questo lavoro rappresenta una prima ipotesi di ricerca sull'impatto del Metaverso nell'educazione. Il digitale e le nuove tecnologie, dopo la pandemia di Covid 19, hanno accelerato la nascita di un nuovo paradigma educativo nelle scuole italiane. La didattica a distanza, la didattica digitale integrata, l'intelligenza artificiale hanno influenzato significativamente le nostre aule, promuovendo nuove possibilità scientifiche per costruire un nuovo modello di scuola. La competenza digitale di studenti, insegnanti e genitori ha sempre più il significato focale di una nuova scuola. Come sarà la scuola italiana rispetto a questo paradigma educativo e quali saranno le best practice promosse dal PNRR? In questo articolo cercherò di definire alcune soluzioni che le scuole potrebbero adottare per rendere le loro aule più digitali e inclusive, sperimentando anche nuovi spazi e ambienti di apprendimento attraverso il Metaverso.

Keywords

Metaverse; Learning; Digital; School; Citizenship.
Metaverso; Apprendimento; Digitale; Scuola; Cittadinanza.

1. The Metaverse between Virtual Space and Real Impact

The advertisements launched by Meta (2022) on the impact of the Metaverse on our lives can represent a breaking point even in the educational field in respect to the past. In the next future, in fact, digital technology can be a challenge and an opportunity for the schools to promote the development of digital and transversal skills.

The Metaverse is a digital asset of interoperable and synchronous 3D virtual worlds that it is possible to explore with your avatar. It is characterized by the continuity of the data, and the identity of the users (TechStar, 2022).

The word Metaverse was born in the '90s, with the science fiction novel "Snow Crash" by Neal Stephenson (1992). The birth of this word represents a real revolution, since the concept of Internet 3.0 was diffused for the first time. The novel was published just three years after physicist Tim Berners-Lee (1994) created the World Wide Web while working at CERN in Geneva, which means that the concept of "metaverse" has existed since the era of the digital age. *Second Life* was inspired by it, one of the first virtual electronic worlds, created in 2003 by another physicist, Philip Rosedale, and since then it has been discussed on various occasions such as, for example, *Online Educa Berlin* (OEB, 2022), although the term only became current after Facebook decided to change the name in Meta and invest in the development of the metaverse. According to Mark Zuckenberg, Metaverso represents a virtual universe capable to promote a better social interaction with avatars, holograms, virtual environments governed by artificial intelligence (OEB, 2022).

The Metaverse, therefore, represents the last step of a technological evolution in which the communicative dimension becomes interactive for the first time, offering a complete and totally immersive experience.

Within the Metaverse, the choice of the environment, the personalization of the avatar and the presence of digital twins make this new virtual space a place where people can meet freely, exchange ideas and information, learn, cooperate and organize strategic choices without considering the real place in which they are.

But how does it work and how do you enter the Metaverse? The Metaverse can be explored through immersive devices such as *Mixed Reality* tools and viewers such as *Oculus* to enjoy an interactive and three dimensional experience.

The access is also guaranteed with mobile devices such as PCs, tablets and smartphones for a "flat" experience without any limitations and many interactions within it. The most important figure that represents the "other" of us in a virtual environment is the avatar. The avatar is the identity used to enter the Metaverse, a digital copy of ourselves, which allows us to express ourselves in an experience very close to the real one. It enables the experience of an immersive communication, not only limited to a 2D profile and to the verbal language which characterizes web 2.0.

The avatar enriches the virtual interaction with some elements of body language and self-expression through first-person movements and behaviors.

The Users, for students and teachers, have the possibility to choose between predetermined avatars and personalized avatars. The choice is virtually infinite: in the Metaverse we can do whatever we want, to obtain our personal representation in this new world. In the Metaverse, avatars carry emotions above all: the creation of expressive avatars implies not only 3D design and technology, but the possibility of collecting the main emotions, analyzing and simulating them.

Sectoral "sub-verses" are emerging within the Metaverse, including the one concerning educational processes (Eduverse).

A very interesting example of Eduverse is the global learning platform K-20 Educators, which is already developing a virtual world, based on web3 or web 3.0, with the aim to collect students and avatars.

There will be many platforms developing in the next future, but the stated ambition is to give learning opportunities based on technologies to all to promote a better equity compared to traditional teaching and learning in the classrooms.

2. New Digital Skills, Merit and Inclusion: the Italian Road

The impact of the new digital technologies has not only transformed our lives, our relationships and our interactions, but has deeply changed the school, the learning spaces and the educational intercourse. In the last twenty years in Italy we have witnessed some gradual changes promoted by the European Institutions with funds for the purchase of the technological equipment and to promote the teachers digital training. Many processes have been done, but many others must be promoting. Very important it has been the National Digital School Plan (2015) supporting the didactic innovations elaborated by the "Good School" Law (2015).

With the law decree n. 161 of 14 June 2022 the School Plan 4.0 was adopted. The Plan is envisaged by the NRRP as a tool to implement the funds for the schools and to support the educational activities in the school of autonomy. It is divided in four sections:

- the first section "Background" defines the context of the support on the didactic and digital transformation processes of the Italian school in the European scenarios;

- the second and third sections "Framework" present the reference framework and the main guidelines for the design of innovative learning environments (Next Generation Classrooms) and laboratories for the digital occupations of the future (Next Generation Labs);

- the fourth section "Roadmap" summarizes the implementation steps of the "School 4.0" investment money.

With the NRRP, the Ministry of Education, within the *School 4.0* investment line, intends to invest 2.1 billion euros for the transformation of traditional classrooms into innovative learning environments and to promote the creation of laboratories for the occupations of the future and an extensive digital transition training program for all school staff.

The definition "Scuola 4.0" derives from the aim to create some hybrid learning environments, which can put togheter physical spaces conceived in an innovative way and digital environments (PNRR, 2022).

From an innovative didactic point of view, we can refer also to other national and European laws.

In fact we can refer to the 2018 European Recommendation which defines the digital competence as a basic competence among the 8 key competences for life and also to Law no. 92 of 20 August 2019 on the "Introduction of School Teaching of Civic Education" (GU n. 195 of 21-8-2019).

About that it is interesting the Article 5 "Education to digital citizenship":

"Respecting the school of autonomy, the educational curriculum considered by the teaching referred to paragraph 1 considers the following essential digital skills and knowledges, to be developed gradually keeping in consideration the age of the pupils and students:

a) to analyze, compare and critically evaluate the trust and reliability of the data sources, information and digital contents;

b) to interact through various digital technologies and identify the appropriate digital means and forms of communication to a given context;

c) to get information and participate to the public debate through the use of public and private digital services; seeking opportunities for personal growth and participatory citizenship through appropriate digital technologies;

d) to know the behavioral rules and to observe them in the use of digital technologies and interaction in digital environments, to adapt communication strategies to specific audiences and be aware of cultural and generation diversity in digital environments;

e) to create and manage the digital identity, to be able to protect the reputation, to manage and protect the data, produced through different digital tools, environments and services, to respect the data and identities of others; to use and share the identified personal informations, protecting yourself and others;

f) to know the privacy protection policies applied by digital services in relation to the use of personal data;

g) to be able to avoid, using digital technologies, health risks and threats to the physical and psychological well-being; to be able to protect themselves and others from potential dangers in digital environments; to be aware of how digital technologies can affect psychophysical well-being and social inclusion, with particular attention to behaviors of bullying and cyberbullying." (OJ No. 92 of 21-8-2019)

It emerges clearly from these documents that digital skills and knowledges are essential in the educational process, also verifying the trust and reliability of the data sources, information and digital contents in a global and digital context. It is essential, starting from nursery school, to learn and identify the digital means and forms of communication to seek opportunities for personal growth and citizenship participatory.

These are the skills on which Media and Information Literacy must necessarily focus and which involve a series of opportunities for the information, communication, creativity and participation (UNESCO, 2011).

The *Guidelines for the teaching of civic education* (MIUR, Law Decree n. 35/2020) also indicate a transversal value matrix which, necessarily, must be harmonized and combined with the various disciplines.

"Digital citizenship" understood as "the ability of an individual to consciously and responsibly use virtual means of communication" must be developed through the media-educational approach of New Media Literacy (Rivoltella, 2020). The result is an education to digital citizenship that has a critical sense, an ethical awareness and a responsibility as pillars (Fabbri & Soriani, 2021). The objective and the need to develop and exercise digital citizenship aims to stimulate the empowerment of citizens to better seize the expressive, creative, relational, informational and participatory opportunities that the media and ICT introduce into society.

From this point of view, the "DigComp 2.2: knowledge, skills and attitudes for each competence" update of 20 March 2022 of DIGCOMP: A Framework for "Developing and Understanding Digital Competence in Europe" 2013 is very important for schools, which provides the tools to develop digital competence at school and digital soft skills. It is important to adfirm that being digital native does not mean being digitally competent (Prensky, 2001).

But what are the opportunities and weaknesses in the Metaverse and, above all, in the Eduverse?

"The use of the metaverse in education constitutes a recent field of exploration, the eduverse, which offers the possibility of obtaining new *spaces* of social communication, greater freedom to create and share, offer of new immersive educational experiences through virtualization, creating an educational and school continuum between the physical space and the virtual space for learning, or an onlife learning

environment, where by onlife we mean: The vital, relational, social and communicative dimension, working and economic, seen as the result of a continuous interaction between material and analogical reality and virtual and interactive reality" (School Plan 4.0, 2022).

The School Plan 4.0 (2022), also focuses on the common requirements of safety, well-being, privacy, which must be guaranteed both for learning environments and for digital learning environments, also with specific educational actions about the risks associated to the improper use of technologies.

In this perspective, the design of the training setting starts from the "design of the environments which must be characterized by mobility and flexibility, or by the possibility of changing the configuration of the classroom on the basis of the disciplinary and interdisciplinary activities and of the teaching methodologies adopted, with easily repositionable furnishings, versatile digital equipment (screen, projection, digital devices for students), wireless or wired network" (School Plan 4.0, 2022).

The promotion of innovative educations (Paniagua, A. and Istance, D., 2018), and related teaching methodologies constitute "an important hub of the didactic and educational planning work to use the full potential of transformed learning environments and it must be designed in context with the spaces, thanks to an educational leadership that can encourage a culture of learning and innovation throughout the school. It is necessary that the didactic planning, disciplinary and interdisciplinary, adopts the progressive change of the teaching process and declines the plurality of innovative pedagogies such as hybrid learning, computational thinking, experiential learning, teaching of multiliteracies and debate, gamification, etc., along throughout the school year, transforming the classroom into an ecosystem of interaction, sharing, cooperation, capable of integrating the proactive use of technologies for the improvement of teaching effectiveness and learning outcomes" (School Plan 4.0, 2022).

Innovative changes and new digital technologies must represent an opportunity for change of learning assessment methods and techniques in a training and motivational key, starting, for example, from ongoing feedback, to monitor and improve the process of learning and teaching.

3. From Metaverse to Eduverse: a New Educational Paradigm?

With the Digital Transformation, soft skills have become skills increasingly linked to technologies. Growing digital soft skills in the citizens of tomorrow means keeping up with the times by developing creativity, productivity and positive performance.

The Metaverse and Artificial Intelligence can give the following advantages for the school:

- to create immersive experiences;
- to monitor engagement;
- to analyze the intangible characteristics of the teaching and learning process;
- to improve the learning process making it more meaningful.

For students, however, the advantages are:

- to interact with the teacher and the educational setting, reviewing flexible times and methods;
- to be connected to the educational process;
- to strengthen interactions and feedback;
- to improve the experience of self-assessment, reflection and shared metacognition;
- to explore and discover through direct experience.

The above must necessarily intervene on phenomena such as educational poverty and digital educational poverty, particularly after the post-pandemic Covid-19 situation.

For educational poverty we must think of "difficulties for children and adolescents to learn, experiment, develop and pursue their skills, talents and aspirations" (Save the Children, 2016) and also the failure to achieve the essential levels of competence (Nanni & Pellegrino, 2018), moral deprivation, of orientations and perspectives, of the quality of the educational proposal, of meanings and values offered for the construction of one's own personal perspective of meaning with respect to life and the world.

If we think to digital educational poverty we must refer to "the deprivation of opportunity i.e. to learn, experiment, develop and let skills, talents and aspirations flourish freely, through the responsible, critical and creative use of digital tools" (Save the Children, 2022); to the failure to acquire skills, in this case digital, i.e. the new alphabets indispensable in the post-media society for analyzing the production and use of information and various digital contents (Pasta & Rivoltella, 2022).

In short, to try to understand the complexity of the training process in contemporary educational research, we must necessarily understand a new relationship between corporeity, the real and the virtual.

There is an important scientific literature in this regard which had analyzed the complexity of the relationship between the learning and the world of virtuality in the Web Society (De Kerchove, 2019).

In this last phase conditioned by the ongoing Pandemic, with the recent project of the Facebook Metaverse paradigm, this issue is becoming the central theme of training.

The person with disability, in fact, with different methods in respect to his/her age in the school, from nursery to secondary school, determines a new way of learning between the self-perception of the body and the real and virtual dimensions of the learning. It is, therefore, the corporeity, perceived in a complex way by the person with disability, which can clarify improve the relationship between real and virtual.

In fact, what must be highlighted in the context of inclusive digital teaching and learning, connected with the use of various dimensions of AI and of Metaverse, is the recovery by the person with disabilities of the "principle of reality" in the self-perception of the world.

Inclusive digital teaching, especially after the development of AI, must promote a technology of culture that represents an "environment rich in technological tools and artifacts" (Hickman, 2000) to better understand the identity of the person and the relationship with others.

The educational issue of the body between real and virtual can constitute an added value that makes us better aware of the characteristics of the person with disabilities and, above all, highlights the sense of body-mind continuity as neuroscience research affirms from a long time.

We cannot go back to the issue of the body-machine "hybridization", which has been studied for some time in the pedagogical-didactic and cyberculture fields (Gui, 2019).

The problem of digital and inclusive teaching, therefore, is certainly decisive for better clarifying the meaning of learning of the person with disabilities between the body, real and virtual and, above all, within the contribution that the Metaverse can determine.

In fact, the Metaverse increases the processes of facilitation of learning and, therefore, can promote the importance of the body for the person with disabilities through a specific adapted teaching. The Metaverse also can be helpful for the person with disability, because with this didactic help he can understand better and deeply his/her personality in the psychological process between the real and the virtual.

It is necessary that policies related to the school are able to educate students to face new challenges in the best possible way, under the supervision of the school considered a "educating community" (Rivoltella, 2020).

Although technology has exerted, from a long time, its influence on education, the interaction between the new frontiers of the Metaverse, automation and Artificial Intelligence (AI) still appears particularly complex to promote digital inclusion.

It is essential to invest in the development of transversal digital skills to build a new epistemological model of inclusion.

As reported in the document *The Future of Education and Skills: Education 2030 – OECD* (2018): "There is a growing demand for schools to prepare students for the fastest economic and social changes, for jobs that have not yet been created, to technologies that have not yet been invented and to solve social problems that did not exist in the past".

On one hand, male and female students will increasingly need to acquire digital skills, related to the functioning and use of Artificial Intelligence, in order to be able to use it to their advantage, distinguishing any improper use.

On the other hand, the Metaverse and Artificial Intelligence would open up new scenarios related to teaching and inclusion, as long as it constitutes a real resource aimed at improving education, without refusing the lessons learned, as well as the ethical principles shared by the school. (McKinsey, 2020).

To do this it is also necessary, not only, to train new occupations capable of embracing only the ethical issues related to the development of an AI solution, but also it is necessary a good training for all teachers, preparing them on didactic, educational and sociological situations and also in the field of disability studies.

It is extremely important to ensure that people with disabilities can take part in technological innovation processes, making educational institutions ever more inclusive in order to ensure that people with disabilities are not left behind by the Metaverse revolution.

This is why it is essential to clarify the issue of inclusive digital school, taking into account the Metaverse. In other words, the Metaverse could help people with disabilities to better manage learning in the relationship between real and virtual. It could improve Adapted Motor Activity and, above all, it could favor the Full Inclusion project, making the inclusion of people with disability the decisive moment for the creation of an inclusive digital teaching.

Even if this theoretical contribution only proposes a research hypothesis to be implemented with a specific experimental model, it is clear that the new dimension of a "technological culture" cannot do without inclusive digital teaching based on AI.

Bodily identity and the intersubjective relationship are the categories that the digital must promote for an inclusive society with less inequality and suffering.

School and Metaverse are reality or science fiction? In Milan there is an institute that has decided to believe in the Metaverse and to invest in it, so as to allow its students to make experience of a hybrid learning, halfway between the traditional and the more innovative one.

We are talking about the St. Louis School, one of the most avant-garde schools in the world, which is divided into various cycles, from 2 to 18 years old. It is part of the Inspired Education Group, which includes many elite global institutions.

This teaching and learning system is based on two worlds that intertwine: in the real world, students study and interact with paper and digital books and have various IT tools at their disposal, from tablets to sensors for augmented and virtual reality.

At the same time, however, an complete virtual school will be born in the Metaverse, which can be reached from anywhere by the students of the Inspired Group. The kids, therefore, will be able to get together and cooperate and live incredible experiences, such as historical reconstructions and scientific and practical experiments. Consequently, they will be able to practice without practicing, therefore without the risk of accidents.

In fact, research by PwC Italy (2022) has shown that learning via virtual reality brings incredibly positive results: students learn better and faster. 40%, in fact, declare that they feel more confident in putting what they have learned to the test, furthermore, the speed of learning increases by 400% compared to traditional teaching.

The question that arises: Will virtual learning one day become public domain?

(Will future education be heaven or hell?

Or a «paraphern»). (Paolo Benanti and Sebastiano Maffettone, 2022)

The answer is simple. If we consider technology as a tool to solve the problems of humankind, then Metaverso could be a good chance for the future, the metaverse, according to NVIDIA (2021), may be "the best possible universe".

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