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New Ontological Perspectives On Artificial Intelligence And Mobile Learning: An Exploratory Study.

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Abstract: The challenges and implications of the evolution of Artificial Intelligences (AIs) in learning are explored in this article, which explores the impact on cognitive construction and education. AI-mediated personalization and authentic assessment are the focus of new pedagogical perspectives. Through market trend analysis, the importance of computing power is highlighted, showcasing the growing interest in generative intelligence powered by key technologies like cloud and chips. There is a clash between using AIs directly, focused on produced responses, and an indirect approach based on biometric analysis for advanced personalization. According to the data, there is a significant acceptance of using mobile devices in education, but there is a distrust of using mobile devices for distance learning, which indicates the complexity of adopting these technologies. Finally, the importance of moving beyond a playful approach is highlighted, with a focus on promoting a new educational paradigm and specific literacy for informed use of AIs.

Keywords: AIEDU; Mobile Learning; digital education

1. Introduction

Analyses of the meaning and functions of AIs would seem to be divided within different interpretative positions, here, for argumentative synthesis will indicate at least two of them: 1. the first that intends to give AIs the value of a tool, understood as a sophisticated technological element capable of supporting the cognitive evolution and development of human processes; 2. the second that attributes to AIs a more pro-deep value, of ontological representation [1], of oriented construction of meanings, thus tending to be less neutral and certainly untethered from the simple vision of a tool [2].

I state at the outset that my position is in fact tied to the second hypothesis: the one that sees in the potentialities and risks of AIs more of an ontological, substantive, oriented function of knowledge than that of a perspective that would like to recognize it as a tool [3].

This position tends to be guided by certain considerations that are referable to the technological nature of simulated intelligence tools and to the very nature of the most successful LLM models. If the Datasets with which Artificial Intelligences are trained are organized syntheses of cognitive contents or recurrences of absolute data, the nature of the organized synthesis of those data produced by AI engines cannot but be strongly affected by those contents.

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Cognitive, exist, numerical, and linguistic contents are never neutral in character, and therefore the results that emerge "ostensibly" as instantaneous creative acts, well organized, cannot but be affected by tendencies to bias the interpreted data [4].

In this sense, we could say that the technologies behind Artificial Intelligences whether supervised (achieved by labeling the corresponding input and output data) or non-supervised (clustering in which input data are aggregated with the machine sorting them according to some common parameters), are substantially affected by the composition of the aggregated data that are presented in the datasets and thus by the cultural content that compose them [5]. This means that the processing produced by Artificial Intelligences is nothing more than the randomized combination, oriented by the user's requests through commands (prompts, scripts), optimized by the systems of weights and counterweights determined by sensory and cultural customs, of content produced by sociocultural communities of various kinds, therefore, it is rooted strongly in the culture that feeds it through the ad-training systems.

The training of artificial intelligence will be based on data produced directly by itself, so recognizing the authenticity and plausibility of processed responses will be the real challenge.

Our goal is to test the ability of AIs to be evolutionary possibilities of humans, specifically in terms of their ability to solve real-life problems. The higher the level of creative abstraction we assign to them, the less we can test their potential or risks. Moving from playful and recreational use to substantive development [fig. 1] is one of the most stimulating challenges that AIs will face [6].

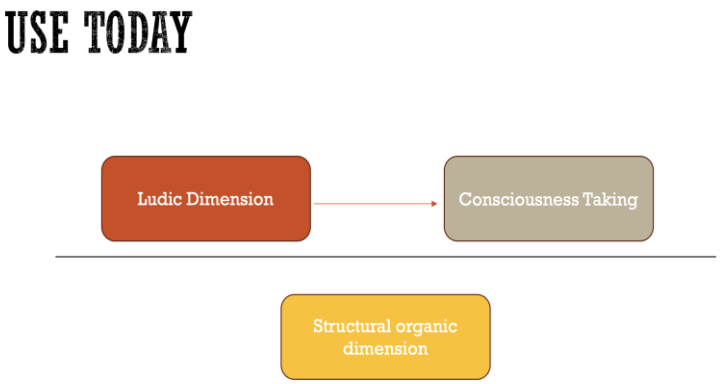

Figure 1 Playful dimension and consciousness raising parallel to continuous structural development.

2. The educational challenge

Education, which is the playground of evolutionary transformativity of the species, is undoubtedly one of the main areas of this transition, and it has all the potential it has [7,8].

The biggest risk, as far as my vision is concerned, will not be relying on AIs to handle some redundant issues of everyday life such as bureaucracy or routines punctuated by functional patterns, as much as it will be reducing overall and gradually the level of control, we will have over the products it processes.

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At present, if I were to ask AIs to talk to me about a given topic and report on it, the product of this request in the relevant communities would come under the scrutiny of our cognitive-cultural systems, thus, would implicitly suffer from additional "oversight" about the responses produced. If the attention threshold were to be reduced through trust, through habit, through overall reduction of cognitive-adaptive effort, the risk would be that of being in an inflatable crib in the middle of the ocean but imagining floating in the swimming pool at home.

A rigorous, critical, mature, and informed approach to using AIs as complex systems that support but not replace human cognitive construction is vital. Certain considerations cannot be separated from this complexity [9]:

- Control cannot be entrusted to direct stakeholders finalized to acquire positions of strategic-economic advantage;
- A comprehensive policy of safety awareness is needed both as an active control action on the increasingly rapid transitions to an AGI, and for indirect passive deterrence control against the misuses of AIs that can already be made today;
- Education, as a primary process of human development, can no longer disregard the development of specific curricula for a technically aware and ethically critical approach about the use of AIs at-through what is called safety consciousness.

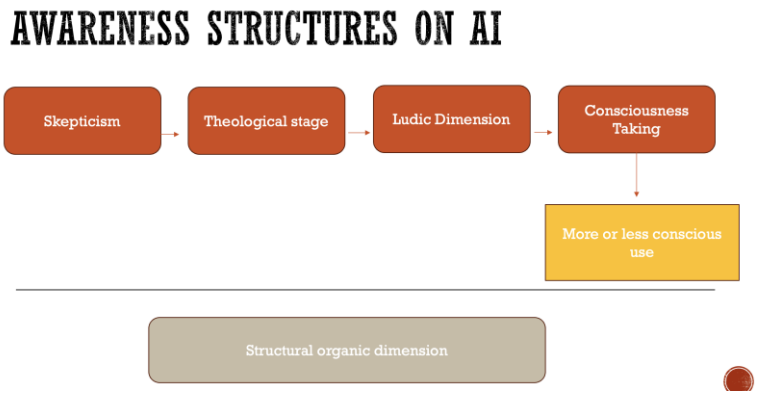

Figure 2 Awareness structures on AI.

3. Technological and epistemological evolution

Technology, which simulates neuronal mechanisms, is transforming knowledge into a new epistemological era. The pattern of multi-millennial linearity of knowledge is broken to connect with the current cultural synthesis that seems increasingly fragmentary, episodic, and rhapsodic [10].

The subjective adaptive matrix can create mechanisms of anticipation and neural structuring that can handle the atomized complexity of contemporary knowledge when cultural processes are re-edited. The fragmentariness is due to the cognitive acquisition mode introduced by the digital, both in its sensory and eminently organizational components. The tendency to distribute attention across multiple sources is significantly increased by short, concentrated content that is interspersed with links that shift attention to topics related to the main ones. Segmentation, division, and alternation of attention processes can be caused by a cocktail effect [11].

A decrease in the depth of attention's own mechanisms is associated with these highly distributed attention processes. In addition, they involve converting sensory pathways in the perspectives of oculo-visual, neuro-synaptic, and metabolic processes. Learning processes that have been structured from a greater linearity and found their phylogenetic way in books and traditional analog systems undergo a recurrent re-writing with obvious adaptive costs. In this bio-cultural endeavor, we are examining the enormous challenge represented first by digital technology, and later by the new ontological presences dictated by artificial intelligence [12].

The paradox involving Artificial Intelligences consists in the fact that although they determine themselves as evolved complex systems of the technological transition, their function aims to reduce the atomizing dispersion of data, aggregating them, re-lating them, connecting them as needed. They prioritize responses that are tailored to the user's proposed queries over the multitude of data.

Reducing plural plots to mere personal responses could lead to a loss of under-standing of how complex and overlapped reality is beyond data aggregation. It's pos-sible that we end up believing that the supportive nature of artificial intelligence is most reassuring.

For these reasons, to avoid falling into the pit of a one-sided, partial and limited view of things, it is appropriate to understand what functions may represent training in the use of generative intelligences and also in the relationship that is generated between man and machine [13].

Traditional learning paradigms are challenged by this revolution, while also a deeper understanding of the relationship between man and machine is introduced.

Artificial intelligence's power in knowledge acquisition presents an unprecedented cognitive synergy, posing fundamental questions about the nature of knowledge and its construction.

The key to achieving a critical educational curriculum that is functional for the new form of a brain intermediated by AIs involves overcoming the current ludic dimension of its creation [2]. Although useful for building confidence with these tools, this perspective tends to favor positions that are more beneficial for companies in selling their digital products than promoting conscious use.

Gaining initial literacy in the functioning of the systems that govern artificial intelligence should be the way forward for conscious enjoyment. The stresses in-duced by the tools used are affecting the deep structures that support neural mecha-nisms.

1. Understanding the main neural computer models that underpin artificial intelligence [14];
2. Obtaining knowledge of the primary programming languages [15].
3. Establishing pathways for understanding and making requests to AIs (Prompt and script literacy) and discovering the most suitable forms for obtaining the requested information.
4. Human learning processes are governed by neurological mechanisms that change epigenically in an adaptive relationship with context [7].
5. The importance of a critical approach to the risks of biases generated by Ais [16].

There are various options for creating a pedagogical curriculum that facilitates the critical and competent use of AI. The revolution in cognitive paradigms occurs due to the deepening of AI's cognitive structures in the literacy process.

Deep reflection on the human cognitive structures is initiated by AI literacy, which provides a detailed overview of the foundations of Artificial Intelligence.

A personalized and dynamic learning is now possible through this reconsideration, which challenges the classical conventions of how we acquire and apply knowledge and sets the foundation for a new epistemology of learning.

The focus of this paper is precisely to rethink how the current phase of development of the human-machine relationship stands as a real revolution in cognitive construction processes, perhaps on par with the birth of printing [17].

The mutation learning processes, and with them those of cultural processes, stand as a problematic reason about what education can put in place in both formal and non-formal systems so that the subject does not experience disorientation.

The emergence of a new educational ontology represents not only a change of labels, but a profound transformation in the foundations of our understanding of knowledge, and with it all those actions that involve a restructuring of the models of education and instruction.

There are some substantial questions that are raised by a new mode of AI-mediated learning processes.

- What is the definition of 'new' knowledge?
- What is the method for disseminating it?
- What is the process of construction?
- What is the process for evaluating it?

4. The economic outlook and technological developments

To understand what the practical prospects of this transition are, one cannot disregard observing some technology-related market trends, since since these ontological systems are mainly related to the power of the IT processes behind them, one can understand some development trajectories.

Michele Chicco's article in Wired on 11/23/2023[18] and Gabriel Debach's interview with Etoro's market analyst revealed the following picture:

in the current scenario, key technologies, such as cloud and chips, are powering generative intelligence and outperforming service-oriented companies with chatbots in attractiveness. They have great performances in the markets the chipset companies Nvidia, Palantir, C3.ai, Upstart, Splunk, Micron Technology and UiPath with growths since the beginning of 2023 bringing Palantir Technologies +219%, C3.ai +161%, Upstart +93%, Splunk +75%, Micron Technology +56%, UiPath +43%.

This means that the real challenge will not be related to software development, which is already abundantly advanced especially in a market that daily fuels the emergence of new programs, as much as to the computing power that big techs deem necessary to power their AIs. Decentralizing centralized systems is only possible through cloud systems. Building homemade AIs for local purposes is highly irrelevant from my perspective.

Today, AI systems produce and illustrate linguistically plausible elements that are not connected to the alleged truths that users demand. At this stage, it is important to focus on understanding functional mechanisms rather than responding to subjective questions and needs.

It is safe to say that AIs follow an ascending, nonlinear growth process, which in many cases is exponential, according to Kuhn's logic [19]. The companies that are

training are more concerned with computational power than with the nature of the datasets. Core-knowledge is reorganized in an unprecedented pattern that is non-linear, ascending, and fragmented, for the benefit of nodular and non-diachronic knowledge.

5. The research on the use of AI mediated by mobile learning [20].

The use of AIs is leading to a development in educational pedagogy that involves mediated personalization and authentic assessment.

The most common way to use AIs is through a direct dimension, which is currently the most utilized, where people interested in using AIs use the responses produced by LLMs, CNNs, and other systems based on direct needs.

Using mobile learning models that are mostly mediated by smartphones and tablets is a useful approach, based on this first and most utilized perspective. We conducted research among teachers from several school of Rome who were taking an ongoing training course to determine if they were ready to use mobile learning tools. According to the 107 responses obtained, almost 90% of teachers interviewed believe that incorporating smartphones and tablets into teaching is feasible [21][fig. 3].

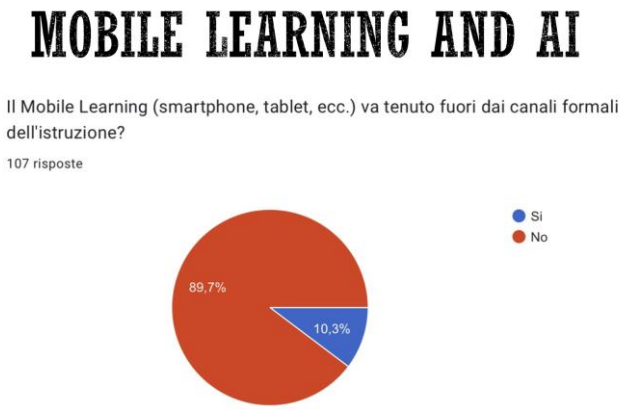

Figure 3 Teachers' acceptance of mobile learning.

We asked the same teachers to answer, on a Likert scale, whether it was feasible to use mobile learning in in-person teaching. It appears that there is a tendency toward this possibility, which is accompanied by an increase in the threshold of liking towards it [fig. 4].

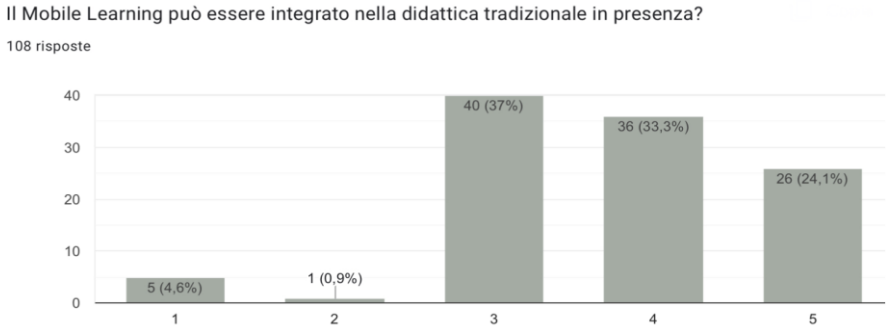

Figure 4 Possibility of integrating mobile learning into classroom teaching.

We utilized a Likert scale to ask another question, this time about the use of mobile learning, specifically for distance learning. What emerged was some wariness about this use, which can mean at least two things: 1. they believe it is more useful for in-presence use, and this would be corroborated by the data that emerged from Figure 4 above; 2. they do not believe it is useful to use Mobile Learning for distance activities exclusively [fig. 5].

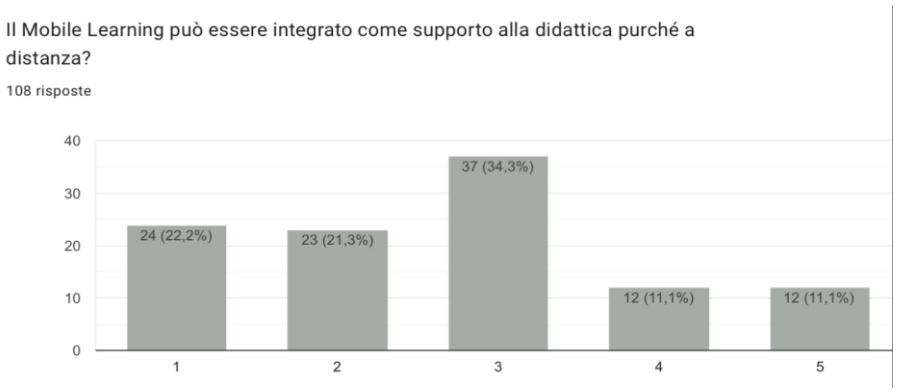

Figure 5 Possibility of integrating mobile learning into distance education.

The debate centers around the possibility of personalization that is strongly influenced by the body, cognitive, and holistic aspects of the subject-in-training. In fact, in perspective, there are possibilities for a more complex, indirect, but much more personalized approach to learning [22].

By analyzing the occurrences of biological sensors, biofeedback of movement, constant cognitive analysis, and the reading and reorganization of all these elements by AIs, this second possibility can be realized [23]. The total process of personalizing learning will be initiated by this. [fig.3].

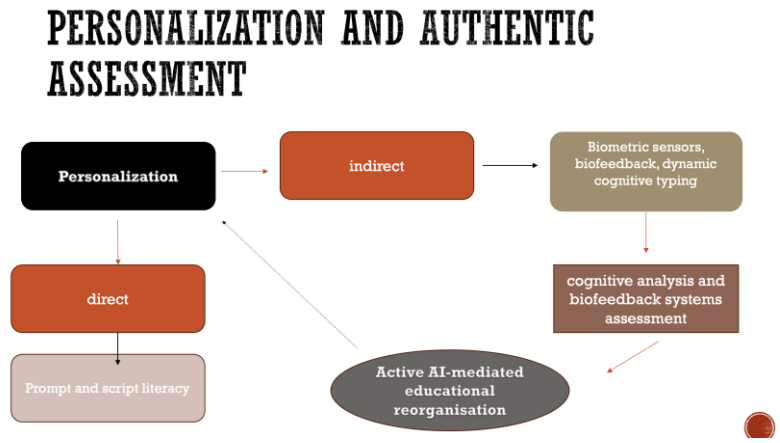

Figure 6 Personalization and authentic assessment.

6. Conclusions

To sum up, the study of Artificial Intelligences (AIs) reveals two significant viewpoints: to see them as sophisticated tools for human cognitive evolution or to interpret them as ontological representations geared towards the construction of meanings. I consider in this work the turn toward the second perspective more substantial, as I glimpse the cultural non-neutrality in data processing and the complexity associated with evaluating AIs, especially during the transition from a player to a substantive role in solving real problems.

The transition to artificial intelligence is considered crucial for the evolutionary transformation of the human species in the educational context. My primary concern is not just entrusting AIs with bureaucratic tasks, but also the gradual decrease in control over the information process. Our cognitive-cultural systems currently supervise AIs implicitly, but the gradual reduction of this control could undermine accurate understanding of reality.

A rigorous and critical approach to using AIs is essential. To avoid direct interests geared towards strategic-economic advantage and the implementation of comprehensive security awareness policies, attention is required to avoid control of this complexity.

The technological advancement of AIs is a turning point in epistemology, as they reinforce the era of disjointed knowledge.

Promoting a new educational ontology through a new educational ontology is essential for pedagogical purposes beyond a playful approach to using AIs. To address risks and challenges related to this transformation, it is important for education to incorporate specific curricula that promote a technically aware and ethically critical approach to AIs, while also including a 'safety consciousness'.

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