

Experience, Learning and AI For an Inclusive School Model

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Abstract: The relationship between AI and Education in the next future will be one of the central issues of teaching in the contemporary school organization. It is necessary, then, that AI be carefully analyzed in an epistemological perspective and considered a didactic device to understand the learning's improvement of each student in the classroom and in the relationship with the family and society. In this particular situation the flipped classroom didactic experience has been an important aspect to define the quality of the contemporary school. The didactic technologies, if they are correctly used, could improve the basic and advanced competences of each student. In this way the most talented students could develop meaningful performances to improve the quality of their learning, in particular if these students can achieve an equilibrium between the competences and the knowledges. In particular, the students with the specific learning disorders could have advantages by the use of didactic technologies to limit their learning deficiencies. In another sense the didactic technology can assist (assistive technologies) the possible empowerment of the competences of the students with disabilities to compensate for limitations of disabilities. For this reason, the inclusive school, based on the principle that the organization of didactics must develop the embedded powers of each student from “the best in the classroom until the disabled student”, must clarify the meaning of a hybrid didactics, which considers the traditional competences of reading, writing and comprehending the text connected with the functions of AI.



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1. Introduction

To analyze the relationship between AI and education in its various aspects is essential to focus on the concept of experience. It is necessary to understand the relationship between experience and education and, therefore, analyze the connection between AI and education based on the centrality of experience.

Regarding the first two aspects, it is interesting to deepen the theme of experience, keeping in consideration Dewey's concept of experience developed in *Experience and Nature* (1925, second edition, 1929), and *Experience and Education* (1938). Afterwards we will examine the meaning of the impact of A.I. on education and its consequences to construct an inclusive school model. Experience, therefore, is problematic, complex and characterized very often by mistake, risk and uncertainty. For

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this reason to develop the learning, which represents an experimental aspect of experience, it is necessary that science and technology orient human learning in a meaningful way.

The human activity is based on the difficult equilibrium between the certain and the uncertain, which can be oriented towards the continuous construction of the human life only by the relationship between art and technological development. In this continuous construction a fundamental aspect is given by the “capability approach” to find new possibilities and experimentations, involving people in a complex process of linguistic communication and social intercourse.

Experience is determined by human activity, which must be considered as a moment of probability and possibility to change and restore the existing precarious order.

2. Experience and Nature. A Scientific Conception of the World

Human nature is the most significant demonstration of the importance of the relation between the individual and the environment. From this perspective Dewey tried to construct a theory of experience from 1925 to 1929. The second edition of *Experience and Nature*, published in 1929, the year of his retirement, is among the most significant moments in his theory, a theoretical “turning point” for the definition of his concept of Pragmatism. In the second edition of 1929, the same year of *The Sources of a Science of Education*, he proposed a new philosophical method, analyzing a new reflection on the concept of experience. In the *Introduction* to the second edition, entitled *Experience and Philosophical Method*, Dewey clarifies the definition of experience, with the method of naturalistic empiricism. This new approach “can inspire the mind with courage and vitality to create new ideals and new values in the face of the perplexities of a new world” (*Experience and Nature*, p. 4). But what is the meaning of “empirical naturalism”, “naturalistic empiricism”, or “naturalistic humanism”? Experience is part of nature. “...Experience is as much of nature as it is in nature. It is not experience that is experienced, but nature -stones, plants, trees, animals, disease, health, temperature, electricity, etc. ...- Experience thus reaches into the depths of nature. It has depth. It also has breadth and is elastic to an indefinite extent...” (*Experience and Nature*, p. 21).

Experience, in other words, is incorporated into the scientific process and the method of intelligence. It is quite evident that there is a primary experience and a secondary experience, to understand the relationship between the individual and the environment. If ordinary experience is not understood through the method of intelligence, which represents the application of science to questions of ordinary experience, it will be difficult to understand the meaning of human experience. The empirical method is the only way to understand the relationship between experience and nature. (*Experience and Nature*, p. 19). What Dewey wants to highlight in the first chapter is the complexity of the subject-object relationship through the connection between experience and nature that only the empirical method can establish. (*Experience and Nature* , p. 34). The complex relationship between experience and nature requires a specific empirical method to be clarified. Firstly this method identifies the questions that arise from the relationship between experience and nature, and secondly, this method goes back to the questions of experience using the scientific method. Following the structure of the subsequent chapters, already defined in the

first edition of 1925, the concept of experience is clarified. These chapters highlight the complexity of the concept of experience, which is based on the subject-object relationship according to the indications of the empirical method of philosophy. The complexity of experience, which must be enlightened through the method of intelligence, is the expression of the continuous relationship between the stable and the precarious. The balance between precarious and stable, in other words, is an expression of a particular conception of human experience, which is not uniform and based on stable values but is constructed on an equilibrium between the accidental events of nature and the centrality of human action. For this reason, a specific interpretation of static, dynamic and causal succession of events must be considered. (*Experience and Nature* p. 87). According to this interpretation, the issues of mechanists are intertwined with those of teleologists. And this happens because in nature everything, transforming into something else, is the beginning of something else and, therefore, is simultaneously static and dynamic. (*Experience and Nature* p. 90). For this reason the development of technology clarifies the importance of the relationship between experience and nature. The progress of science and technology, therefore, is based on the organic link between experience and nature. In ancient science, the essence of science was demonstration; the lifeblood of modern science is discovery. This is fundamentally expressed in an educational metaphor. "It is a transaction in which nature is the teacher, and in which the teacher attains knowledge and truth only through the learning..." (*Experience and Nature* p. 122). Discovery is linked to the ongoing process of verification, but secondarily, this process of ongoing discovery and constant verification is linked to the second fundamental consequence of the cognitive process that develops in nature: the application. The application is a consequence of discovery. (*Experience and Nature* p. 129). The method of discovery and application is the basis of the method of intelligence. Philosophy applies an empirical method to better defining the meaning of participation, restoring the connection between philosophy, education, and democracy that has always characterized the Deweyan theoretical construction. Dewey himself defines the term experience as "home," to clarify that the subject depends on external events and limits the contradictions that exist between his expectations and the unexpected events. From this perspective, the final three chapters of the work focus on the theme of human existence, in relation to consciousness, art, and value. It is clear that the experience-nature circle defines subjectivity as a mind-body continuum, already identified in the texts *Soul and Body* (1886) and *The Reflex Arc Concept* (1896). In this context, consciousness is a defining moment of subjectivity. The mind-consciousness relationship determines the continuous re-determination of the meanings that develop within the relationship between experience and nature and all of this is demonstrated with empirical evidence, for a slow transformation of habits, as he had already hypothesized in the 1922 book *Human Nature and Conduct*. Subjectivity, in fact, must reconstruct events since objects present themselves as "meaningful events". (*Experience and Nature*, p. 244) What emerges clearly in the discussion of the final chapters is the definition of subjectivity as a "living organism" in which there is no separation between the surface of the skin and the interiority of consciousness. Indeed, this relationship determines a specific emergence of consciousness as a problematic aspect of Nature. In fact, the awareness that emerges from subjectivity is the sense of the relationship between experience and nature, which is problematic because it tries to construct a difficult equilibrium between certainty and probability and requires the

scientific experimentation to solve the problems. This is the characteristics of the “living organism”, linking thought, intelligence, and science as an “intentional direction of natural events” to grasp and enjoy the specific meanings of human experience through the creative dimension of art. Art is a fundamental aspect of experience as the individual's creative experience and action, as he later clarified in various issues of *Art as Experience* (1934).

The “living organism” is the expression of the relationship between the individual and the environment and can be considered the construction of the concept of learning.

3. Experience, Learning and Education

The concept of experience determines the concept of learning which must be linked to education. These three categories are the basis of a didactics theory in Dewey. First, it must be clarified that learning is based on a constructive, not passive, and receptive attitude of the student. *Learning by doing* is an approach that emphasizes practical experience as the primary means of acquiring knowledge and skills. It is established on Dewey's theory of education. The student is actively engaged in the learning process. Through direct interaction with curriculum and experimentation, learners develop a meaningful learning, improving critical thinking and problem-solving skills. This approach promotes a dynamic and participatory education which prepares students to respond creatively and actively to real-world challenges. *The theme of experience* is closely linked to learning. For this reason, the book of 1938 *Experience and Education* represent the most significant moment to deepen the relationship between experience and learning. This book expresses the complex relationship between experience and education, which is fundamental to understanding the meaning of experience as an educational phenomenon. Compared to traditional education, which is transmissive and teacher-centered, the true innovation of progressive education is its relationship with experience. “I consider it clear that the fundamental unity of the most recent philosophy lies in the idea that there is an intimate and necessary relationship between the process of actual experience and education. If this is so, the successful development of its basic idea depends on having an exact idea of experience... ?” (*Experience and Education*, pp. 6-7). The relationship between experience and education, therefore, constitutes the central educational problem of Dewey's Thought: what is the meaning of freedom? In this sense, traditional education was tied to the problems of the past, whereas progressive education develops the future plans of human potential. Indeed, even traditional education transmits past experiences, these experiences are flawed because they do not allow future experiences to develop. Experience, in other words, is linked to learning because progressive experience must seek to connect with future experiences. In other words, experience is governed by the continuous process of action which develops the human potential analyzing the consequences of its action to solve a specific problem. In this sense, it's quite clear that growth develops in one direction, but if that direction is negative, this dimension must be halted. In this sense, the teacher must understand the characteristics of the student's experience and help to develop him/her, considering the surrounding conditions that shape the experience. Indeed, teachers are designers of learning environments and of the unique and unrepeatable growth of each student. For this reason, teachers must consider the situation in which the student's inner dimensions develop in relation to the stimuli of the environment in which they live. Experience, therefore, can be considered positive or

negative. This depends, fundamentally, on the direction this path may take. A negative experience develops in a direction that, in Dewey's view, cannot be continuous. A negative experience is halted because it can develop, but this occurs against ethical norms, or against the characteristics of personal and social life. This is why education cannot be considered preparation for subsequent learning, but education is characterized by experience that expresses a clear relationship between continuity and the interaction of the individual with the environment. This dimension of the relationship between continuity and interaction determines the need for social control, which is inherent in the development of the experience itself. The experience that develops the embedded potential of each person also decisively develops the social control of human action. It is therefore essential to educate an experience as a project for individual development in relation to the natural and social environment. This aspect is fundamental to understand *Experience and Education*: freedom is linked to the development of experience, which determines a constructive dimension of learning. From this perspective, critical reflection is essential to understanding how to orient the perspectives of human nature toward the future project of human action. The central aspect of the human project is determined, in Dewey's view, by its purpose, by its ability to achieve a goal. It is essential that the school curriculum be structured to reflect the various dimensions of experience within the curriculum organization, to highlight problems and stimulate reflection. It is clear that the central theme to understand democratic school is the centrality of the relation between experience, linked to the importance of science and technology. The concept of experience determines the progressive development of student's learning. But the relation between experience learning and education must be in the contemporary school linked to technology and governance. (Domenici et alii, 2023). Digital technology and Artificial Intelligence, therefore, represent a technological model that integrates with human experience. Experience is the hub of the various disciplinary, cultural, and technological dimensions that develop in learning. Above all, the relationship between experience, learning, and Artificial Intelligence represents a fundamental epistemological and educational question for delineating the possibilities of contemporary inclusive education.

4. Epistemological and Educational Applications of AI to Education. A New Educational Paradigm

Artificial intelligence can become a valuable device to transform educational processes. Its ability to analyze and interpret data and offer a personalized experience opens new horizons in the field of learning and, above all, determines the possibility of defining a new educational paradigm for contemporary schools. (Rivoltella, 2024) One of the fundamental epistemological questions to clarify the relationship between Artificial Intelligence and teaching is the problem of developing human experience as a means of qualitative improvement of learning. It is important to affirm that Artificial Intelligence will hardly replace the educational and professional role of teachers. Teachers will always be indispensable in providing emotional and social support to students, guiding them through the learning process, and designing and delivering knowledge that goes beyond the capabilities of an algorithm. (Moriggi, Pireddu, 2024).

Artificial Intelligence can be used in various areas of education and in the various dimensions of teaching. For example, it could demonstrate:

- a. the definition and design of specific interactive and stimulating teaching materials for meaningful and creative learning;
- b. the designing personalized assessment of student skills, identifying areas for improvement and offering detailed feedback;
- c. the automated management of administrative tasks to improve the organizational quality of learning.

These applications can improve the efficiency of schools and universities, as fundamental places of learning, allowing teachers to focus on the didactic aspect of teaching, improving the organization of the school and monitoring the meaningful learning of each student. (Ausubel, 2004)

Another key benefit of Artificial Intelligence is its adaptability to the potential of individualization and personalization in teaching, helping students with disabilities, along with various categories of S.E.N, and those with learning difficulties, have a more inclusive and equitable educational experience. Furthermore, the use of new Artificial Intelligence technologies can overcome geographical and socio-economic barriers, allowing students to access high-quality educational resources from anywhere in the world. (Ianes e Hedrun 2024) However, the introduction of AI in education also raises important ethical and privacy issues. It is essential to ensure the protection of student data and respect the principles of AI ethics, such as transparency, interpretability, and human oversight. Artificial Intelligence algorithms must be developed and used responsibly, taking into account the educational context and the fundamental values of education and mutual respect. Teachers must also be adequately trained to understand and use AI correctly to ensure value to the educational experience. Artificial Intelligence has the potential to radically transform the field of education, improving student learning, supporting teachers, and creating a more inclusive and equitable educational environment. However, to get the benefits of Artificial Intelligence, it is essential to adopt a thoughtful and responsible approach. Artificial Intelligence should be seen as a complement to human intelligence, a valuable aid in improving the quality and efficiency of education. With adequate training for teachers, students, and school administrators, Artificial Intelligence could open up new possibilities in education, offering new learning opportunities and preparing students for high-level cultural and professional development. The central goal is carefully prepare students, equipping them with the tools and skills necessary to become informed, responsible, and highly competent citizens, capable of contributing fully and positively to the society they live in. It is essential to emphasize the importance of educational processes, as they have a direct impact on individual and collective growth, as well as on the social, cultural, and economic progress of an entire nation. This advanced technology has the potential to bring about significant changes in education, offering new opportunities to improve teaching approaches, increase teacher effectiveness, and reduce educational inequalities. Thanks to Artificial Intelligence, it is possible to develop and implement innovative and personalized tools that facilitate learning and promote greater inclusivity within classrooms, allowing each

student to have a tailor-made educational experience, aligned with their needs and abilities. (Pancioli e Rivoltella, 2021).

New technologies based on Artificial Intelligence, such as interactive virtual tutoring systems, can provide valuable support to both students and teachers. Thanks to these tools, students can access personalized learning materials, receive instant feedback on their learning, and follow a study program tailored to their specific needs. Teachers, on the other hand, can benefit from the assistance of algorithms capable of analyzing student progress data, allowing them to promptly identify any difficulties or gaps. Artificial Intelligence can play a crucial role in promoting inclusive education and eliminating linguistic and cultural barriers. Through the use of machine translations, multilingual chatbots, and other AI-based applications, students from diverse sociocultural backgrounds can overcome communication difficulties and fully enjoy the benefits of a global education (Di Pace, Bonaiuti, 2023). Artificial Intelligence can improve access to education, even for disadvantaged groups, ensuring quality learning for everyone, everywhere. Despite the many advantages and potential of Artificial Intelligence in education, it is essential to remember that it cannot, and should not, replace the important role played by teachers. Teachers remain the key players in the learning process, with their experience, insight, and ability to inspire students. Artificial Intelligence, therefore, is not just a tool that can optimize educational processes, but rather a valuable ally for teachers, supporting them in their work and enabling them to achieve higher levels of effectiveness and satisfaction. In fact, the structure of inclusive school develops within the two categories of individualization and personalization and, to promote these two dimensions, Artificial Intelligence becomes fundamental and necessary to improve the quality of the school. (Limone, 2021). In particular, personalizing learning is one such application of AI to teaching, allowing content and teaching methods to be adapted to the specific needs of each student. Using advanced algorithms, AI can analyze student data, identifying their gaps and abilities, and provide a personalized learning path (Sibilio, 2023). This approach promotes more effective and engaging learning, increasing student interest and allowing them to improve their learning. By collecting and analyzing student data, AI systems can develop an individual profile for each student, understanding their needs, preferences, and abilities. Based on this information, AI can create personalized learning plans, offering content and activities tailored to each individual's needs. Furthermore, personalizing learning can help teachers monitor and evaluate student progress more accurately, offering the ability to intervene promptly to provide personalized support. Thanks to the use of Artificial Intelligence algorithms, assessment can be automated, allowing for faster and more efficient correction of students activities. Artificial Intelligence can analyze student results, evaluating their answers based on predefined criteria and providing immediate feedback. This approach saves teachers valuable time spent on manual grading, allowing them to focus on more meaningful learning activities.

Additionally, automated assessment can provide students with an immediate and detailed evaluation of their performance, helping them identify areas for improvement and progress in their learning. It's essential to define learning spaces to better understand the personalization and assessment process. Artificial Intelligence has opened up new possibilities in the creation of learning spaces and content. The

processes of personalization and the various dimensions of educational assessment through automated assessment and virtual tutoring construct a teaching paradigm in which the dimensions of Artificial Intelligence can find an interesting place for experimentation and application. The most significant perspective on the application of AI to teaching is the construction of a new hybrid, simplex learning space, inspired by John Dewey's didactic theory and considered fundamental for teacher training.

Conclusions. An hypothesis

The relationship between experience, learning, and AI is the meaning of a new educational structure to be analyzed in its epistemological complexity and in its structural and dynamic functions. This connection will likely reshape the meaning of learning and teaching models and will seek the meaning of a possible inclusive school model through epistemological reflections and teaching and assessment experiments to hypothesize a possible new inclusive school model.

Authors should discuss the results and how they can be interpreted from the perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted. We think, also with support of different possible experimentations, that AI must be considered a fundamental aspect of the relation between experience, learning and education. This will be a new paradigm of the future high level inclusive school.

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