

EMOTIONAL SKILLS IN THE AGE OF ARTIFICIAL INTELLIGENCE AT SCHOOL: TEACHERS' TRAINING AND STUDENTS' OUTCOMES

COMPETENZE EMOTIVE NELL'ERA DELL'INTELLIGENZA ARTIFICIALE A SCUOLA: TRA FORMAZIONE DEGLI INSEGNANTI E RISULTATI DEGLI STUDENTI



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ABSTRACT

Artificial intelligence (AI) has emerged as a viable tool for transforming the educational landscape, including its use in Special Education. These systems improve learning outcomes and encourage student engagement (Fazil et al, 2024). This Mixed Methods research aims to highlight the training teachers' needs about the use of AI and how to integrate innovation, tradition, and emotional skills in school to comprehensively train all students, no one excluded.

L'intelligenza artificiale (IA) è emersa come un valido strumento per trasformare il panorama educativo, compreso il suo utilizzo nell'educazione speciale. Questi sistemi migliorano i risultati dell'apprendimento e il coinvolgimento degli studenti. Questa indagine esplorativa, in Mixed Methods, evidenzia le esigenze di formazione degli insegnanti sull'IA e su come integrare innovazione, tradizione e competenze emotive a scuola per formare in modo completo tutti gli studenti, nessuno escluso.

KEYWORDS

Artificial Intelligence; Emotional skills; Teachers' training; Innovative Approach; Student' engagement
Intelligenza Artificiale; Competenze emotive; Formazione dei docenti; Approcci innovativi; Coinvolgimento degli studenti.

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¹ This paper is the result of the shared work of the authors; however, for the purposes of the attributions of its individual parts it is divided as follows: Maria Concetta Carruba: Introduction, §§ 2 and Conclusion; Alessandro Barca: §§ 3; Valentina Paola Cesarano: §§ 1. Abstract, in both versions, are attributable to the three authors.

Introduction

Artificial intelligence (AI) has emerged as a promising tool for revolutionizing the educational landscape, including its application in special education, to meet learners' needs. An increasing body of research is being done to examine how artificial intelligence (AI) might improve teaching methods, especially when it comes to meeting students' needs (Aruanno, Carruba, et al, 2024). AI-based learning platforms, adaptive testing, and intelligent tutoring systems have become popular in the field of traditional education. By using algorithms to evaluate student data, spot learning trends, and provide feedback and content that is specifically catered to each student, these systems increase learning outcomes and foster student engagement (Fazil et al, 2024; Prokoskaia et al, 2021). Additionally, students can get round-the-clock support from chatbots, virtual tutors, and educational assistants driven by AI, which personalizes support and scaffolds learning experiences (Chen et al, 2023). In the context of special education, AI has the potential to provide inclusive learning environments and support students with various capacities. The potential of AI-driven assistive technology, such as text-to-speech converters, adaptive interfaces, and speech recognition systems, in fostering accessibility and meeting unique learning demands has been brought to light in recent research (Song et al, 2024). Furthermore, through interactive virtual environments and humanoid robots, AI-based therapies for neurodevelopmental disorders, such as autism spectrum disorder (ASD), have shown promise in promoting the development of social skills and improving communication (Iannone, Giansanti, 2023; Wang, 2023).

1. New Technologies at Schools

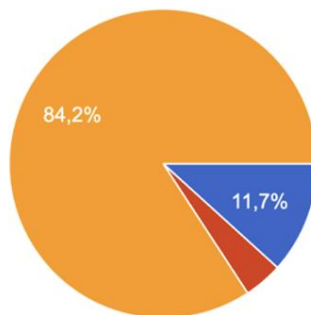
The primary objective of the use of new technologies in the field of education for pupils with disabilities and special needs is to promote equity in educational opportunities. The use of new technologies is not an end in itself; rather, it is a means of supporting individuals' learning opportunities. In Italy, as provided for by Law 107/2015 reforming the education system in Art. 1 paragraph 56, the Ministry of Education, University and Research, with Ministerial Decree no. 851 of 27/10/2015, adopted the National Digital School Plan. It is not just a declaration of intent, but a real overall strategy of innovation of the school, as a fundamental pillar of the reform plan outlined by the law. One of the objectives of the use of new technologies in the field of education is to promote equity in educational opportunities, with specific reference to pupils with disabilities and special

educational needs (UNESCO, 2011). This is an opportunity to innovate the school, adapting not only the structures and technological equipment available to teachers and the organization but, above all, the teaching methodologies and strategies used with the students in the classroom. Numerous studies (Bocci, 2018; Booth, Nes, & Strømstad, 2003; D'Alessio, Medeghini, Vadalà, & Bocci 2015; Dovigo & Pedone, 2019) note that the quality of the teaching/learning process is influenced by the inclusive quality of teachers and context, as well as by learners' perception of it; so much so that it is recognized that, if educational processes are to be improved at school, a key element for its development would depend on the acquisition or enhancement of teachers' inclusive capacity (Ferrara, 2020). In Italy, as provided for by Law 107/2015 reforming the education system in Art. 1 paragraph 56, the Ministry of Education, University and Research, with Ministerial Decree no. 851 of 27/10/2015, adopted the National Digital School Plan. It is not just a declaration of intent, but a real overall innovation strategy of the school.

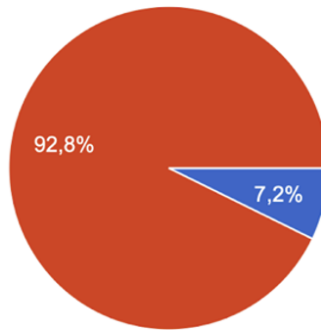
2. The exploratory Study

Chatbots, virtual tutors, and AI-powered educational assistants help to customize and scaffold their learning experiences (Chen et al., 2023). AI can support students with different capacities and provide inclusive learning environments. Recent research has highlighted the promise of AI in promoting accessibility. Based on the results of an exploratory survey, this Mixed Methods research aims to highlight the training teachers' needs about the use of AI and how to integrate innovation, tradition, and emotional skills in school to comprehensively train all students, no one excluded. The study was conducted through an online questionnaire administered to teachers of all levels within the Italian territory. A total of 222 responses were obtained, distributed across geographical areas within the Italian territory: north, south and islands, and central regions (Blue: Responses from the North [11,7%]; Red: Responses from the Central Region [4,1%]; Yellow: Responses from the South and Islands [84,2%]).

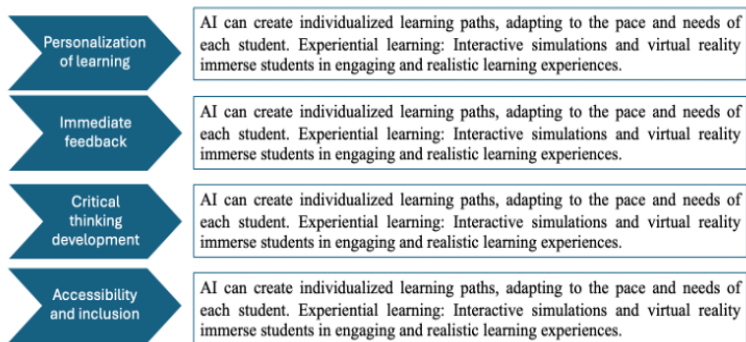
222 risposte



The research was conducted on teachers of all levels within the Italian territory through an online questionnaire. The sample was randomly selected based on contacts with educators who had previously participated in training programs involving the researchers of this study as instructors, with a focus on courses related to special education certification. The questionnaire was implemented using Google Forms. This exploratory study used a mixed-method approach to obtain both quantitative and qualitative results in three areas - digital innovation, inclusive education, and teachers' training. The questionnaire comprised 44 items (11 of which were open-ended), distributed equally among the three topics under investigation. Closed-ended questions made it possible to obtain meaningful data from a purely statistical point of view, with multiple-choice and checkboxes (with multiple possible answer options) evenly distributed. Open-ended questions in paragraph mode allowed teachers to express their reflections, report classroom experiences, and provide detailed answers based on their personal and professional experiences. The open-ended responses were analyzed in terms of qualitative value, which allowed for tracing the relationship between closed and open-ended questions, identifying the frequency of words, terms, and needs, and identifying orders of priority. This exploratory study was aimed at teachers of all school levels on the entire Italian territory, with a sample of teachers identified by simple random sampling. Though the response number (222) is not exhaustive, it presents a picture of territorial differences promptly. The mixed-method analysis allows for tracking benefits and risks experienced by teachers on AI. The teachers were asked whether they had ever used AI tools in the classroom. The outcome of the data collection is as follows (Blue: Positive Responses[7,2%] Red: Negative Responses [92,8%]):



Nowadays, Artificial Intelligence (AI) is part of the world of science education, revolutionizing learning, and opening new frontiers for teaching (Nihal, Akbay, 2023). The utilization of AI-powered tools undoubtedly offers an array of opportunities to revolutionize science learning by making it more engaging, effective, and personalized. However, this transformation demands that teachers acquire new skills to effectively harness the potential of AI and guide students in this modern educational landscape. To this end, the qualitative evidence collected from open-ended questions in the questionnaire is meticulously grouped and visually represented, categorized by overarching usage themes, to provide a comprehensive understanding of the impact of AI in educational settings.



In addition to preparation for digital content, in the open-ended responses related to questions about training needs, teachers emphasize the importance of addressing students' emotional competencies.

This entails not only imparting technical skills but also fostering a supportive and empathetic learning environment where students feel valued, understood, and equipped to manage their emotions effectively. Recognizing that emotional well-being is intertwined with academic success, educators advocate for strategies and resources that promote social-emotional learning, resilience, and empathy. They emphasize the need for professional development opportunities that equip teachers with the knowledge and tools to integrate socio-emotional skills into their teaching practices, thereby nurturing students' holistic development and fostering a positive classroom climate conducive to learning. Expanding further on the topic, we can consider the works and recommendations of both UNESCO and the OECD (Organisation for Economic Co-operation and Development) regarding socio-emotional skills in education. Both organizations have emphasized the importance of integrating the development of emotional and social competencies into educational systems to promote students' well-being and their success both academically and in future work.

UNESCO, through the International Commission on Education for the Twenty-first Century, has emphasized the importance of education aimed at realizing the full human potential. In its 1996 report titled "Learning: The Treasure Within," UNESCO highlighted the importance of developing not only academic knowledge but also cognitive, emotional, and social skills. Additionally, UNESCO has promoted the integration of socio-emotional skills into school curricula and emphasized the crucial role of teachers in teaching and modeling these skills.

Similarly, the OECD has conducted in-depth research on socio-emotional skills through its Programme for International Student Assessment (PISA). PISA reports have highlighted the significant role of socio-emotional skills in determining students' success not only academically but also in their personal and professional lives. The OECD has emphasized the need to measure and develop skills such as collaboration, communication, emotional management, and resilience, in addition to traditional cognitive skills.

Both organizations have provided guidelines and recommendations to support the efforts of member countries in integrating socio-emotional skills in education. This approach reflects a holistic view of education that recognizes the importance of developing not only the mind but also the heart and spirit of students to prepare them to face the challenges of the contemporary world.

3. Student's engagement

Student engagement is a key factor in effective and sustained learning. It is a state of active participation and interest in the learning process, manifested through curiosity, motivation, collaboration, and engagement. Artificial intelligence (AI) can play a significant role in promoting student engagement in several ways:

1. Personalization of learning:

AI can analyze individual student data, such as their learning styles, interests, and progress, to create personalized learning experiences. This can include choosing content and activities suited to each student's level, providing real-time feedback, and creating individual learning paths.

2. Interactive and engaging learning:

AI can be used to create interactive and engaging learning experiences that capture students' attention and motivate them to learn. This can include the use of educational games, simulations, virtual and augmented reality, chatbots, and other immersive technologies.

3. Immediate feedback and individualized support:

AI can provide students with immediate and individualized feedback on their tasks and progress. This can help them identify their strengths and weaknesses, correct errors, and improve their performance.

4. Individualized tutoring and support:

AI can be used to provide students with individualized tutoring and support. This can include access to intelligent chatbots that can answer students' questions, provide explanations of difficult concepts, and help them solve problems.

5. Development of future skills:

AI can help students develop key future skills such as critical thinking, problem-solving, communication, and collaboration. This can be done through project-based learning activities, role-playing, and simulations.

The principal AI tools individualized by teachers as inclusive and useful tools to promote learning engagement are:

1. **Intelligent tutoring systems:** these systems can assess students' knowledge and provide them with personalized explanations of difficult concepts.

2. Adaptive learning platforms: these platforms provide students with content and activities tailored to their learning level and interests.
3. Educational simulations and games: these immersive experiences allow students to learn in a fun and engaging way.
4. Intelligent chatbots: these chatbots can answer students' questions and provide support and encouragement.

Conclusions

Artificial intelligence (AI) has the potential to revolutionize the field of education by promoting student engagement in a more meaningful and personalized way. However, it is important to address the challenges and obstacles that come with AI and develop appropriate strategies and training to make the most of its potential. When used consciously, AI can transform schools into inspiring, effective, and inclusive learning environments, preparing students for the challenges of the future. One of the major concerns reported by teachers regarding the use of AI is the lack of adequate training for educators in utilizing AI for teaching purposes. Teachers may be resistant to using AI due to a fear of not being proficient in the technical aspects of AI tools, the apprehension of using the tools inappropriately, or the concern that students may misuse them. It is crucial to provide proper training and support to educators so that they can confidently incorporate AI tools into their teaching practices and create a positive impact on student learning. This exploratory study sheds light on the need to provide proper training to teachers in Italy on how to incorporate AI in schools. Although this study does not pretend to provide a comprehensive overview, it has been conducted for teachers of all levels across Italy. The study has shown that teachers recognize the importance of innovation in education, but they also emphasize the need for innovation in teaching practices. Teachers have a good understanding of the benefits of incorporating AI in education, including its potential to promote inclusivity. However, concerns remain regarding the effective use and instructional design of AI as a learning environment, rather than just a mere tool. Overall, this study highlights the importance of providing teachers with the appropriate training and resources to ensure that AI is used effectively and efficiently in the classroom.

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