EMOTIONAL INTELLIGENCE AND ARTIFICIAL INTELLIGENCE FOR A SUSTAINABLE FUTURE

INTELLIGENZA EMOTIVA E INTELLIGENZA ARTIFICIALE PER UN FUTURO SOSTENIBILE

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ABSTRACT
The purpose of this research is to investigate whether the use of A.I. (Artificial Intelligence) can develop skills related to E.I. (Emotional Intelligence). Is it possible to digitally combine learning contexts? Is it possible to develop new educational processes and improve performance in school and in life? For this reason, it was decided to interview a sample of teachers in the cities of Rome and Naples to understand to what extent technological devices and E.I. are used in teaching practices and how much to promote pathways with a view to social sustainability.

Lo scopo di questa ricerca è quello di indagare se l'uso dell'I.A. (Intelligenza Artificiale) può sviluppare le competenze relative all'I.E. (Intelligenza Emotiva). È possibile abitare digitalmente i contesti di apprendimento? È possibile sviluppare nuovi processi educativi e migliorare le prestazioni in ambito scolastico e di vita? Per questo si è deciso di intervistare un campione di insegnanti delle città di Roma e Napoli per capire quanto i dispositivi tecnologici e quanto l'I.E. vengano utilizzati nelle pratiche di insegnamento e quanto per promuovere percorsi in un'ottica di sostenibilità sociale.

KEYWORDS
Digital Equity; Social Skills; Sustainability Education
Uguaglianza Digitale; Competenze Sociali; Educazione alla Sostenibilità

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Introduction

The purpose of this study is to make an initial research contribution to the ongoing debate on the use of Artificial Intelligence (A.I.) and Emotional Intelligence (E.I.) in education. The thoughts of a group of secondary school teachers regarding the widespread use of A.I. in students' daily learning, such as the use of GPT Chat for homework, or other generative artificial intelligence platforms, prompted the start of research on these subjects. This leads to the question of whether teachers are open to using these tools to help develop students' E.I., rather than just making them passive users. The aim is to equip students with emotional and cognitive awareness, enabling them to make use of new technologies while maintaining a critical and self-reflective approach to them.

One will remember the text you provided. Currently, there is ongoing research and investigation into specific individual aspects, such as how open teachers are to using artificial intelligence in schools, or whether this new technological frontier can help improve inclusion for students with emerging special needs, or even if it is focused on teachers' self-perception of their communication in the classroom. There is no scientific contribution was found that conducted a survey of the current assessment of Italian teachers on both topics, linking the use of artificial intelligence to the goal of imparting emotional competencies in the classroom. Therefore, this study presents an initial research contribution to the current use of Artificial Intelligence and Emotional Intelligence in the educational context with an integrated approach.

The investigation aimed to understand the current state of the use of AI and EI in learning and teaching processes. It examined various aspects, such as teachers' familiarity and competence with AI, the influence of these technologies on school inclusion of students with special educational needs, and how teachers can use artificial intelligence to enhance emotional competence in learners. This survey research addressed these and other related issues.

1. Frame of reference

The Fourth Industrial Revolution, made possible by rapid technological advancement in recent years, is leading to radical changes in the world of work and the economic system. It is also profoundly altering «individuals' understanding of the inner and outer world». (Sacchetti, 2022). The increasingly widespread use of new digital technologies entails not only a change in the «way we interact with the world and relate to it» but also affects the «way we conceive ourselves and interact with each other» (Sacchetti). «Even though technology has greatly increased connections and interactions between people and organisations, it has not led to positive trends in collective well-being» (Sacchetti). According to Borgonovi (2019), «The global market, the numerous exchanges, the breakdown of relationships, the lack of dialogue, the uniformity of technological automatisms in the digital world the prevalence of 'weak thought,' albeit globalised, and the increasing lack of meaning in relationships, make it much more challenging to establish an ethical foundation as a common good and a reference point for social and economic interactions». We can agree with Sacchetti that the widespread interconnection of devices is altering human intelligence and its ability to process information. This is leading to reduced capacity for concentration, increased fear of isolation and attention disorders, and a growing pursuit of instant gratification, ultimately diminishing the ability to think critically. Therefore, there is an urgent need for a new form of humanism, a 'digital humanism' as proposed by Julian Nida-Rümelin and Nathalie Weidenfeld (2018). This digital humanism «recognizes the importance of technology and human needs but avoids apocalyptic visions of the future. It places trust in human reason while acknowledging and emphasising the limitations of technology». It is crucial to promote technological progress that enhances human perception, allowing artificial intelligence and emotional intelligence to cooperate in decision-making processes». (Sacchetti, 2022).

According to Malavasi (2020), «there is a significant risk that education will become increasingly reliant on technology rather than focusing on making the use of technology more human-centred». It is pivotal to determine the extent to which we can promote the humanization of Artificial Intelligence instead of simply allowing technological progress to lead to a more technology-focused approach in education. The author emphasises the importance of adopting Artificial Intelligence devices, technologies, and robotics «to contribute to human education and protect the environment». It is essential to focus on pedagogical and educational aspects related «to shared knowledge construction and equitable access to training and

educational opportunities rather than just technological devices». Seldon (2018) states that «the future of education is already here, so it is essential to rethink the education system without delay». Focusing on pedagogical and educational aspects and ensuring equal access to knowledge and education for everyone is foundamental. «It's important to consider that technological tools alone do not encompass the entire knowledge process. They need to be adapted to fit a specific knowledge process, making educational design crucial. This involves the intention of the designer and the overall human experience, aiming to harmonise the knowledge process within a path of humanization» (Pati, 2007). We can leverage AI to enhance student's learning outcomes in educational environments and also to apply acquired skills in real-life situations. This could provide equal opportunities for educational success and personal fulfilment, especially when considering the use of artificial intelligence to include learners with disabilities. AI «allows for personalised learning by analysing a student's learning behaviours, preferences, and abilities using specific algorithms. This enables educators to tailor teaching materials and strategies accordingly» (Manzo, 2023).

Persuant to recent literature, it is important to consider the use of A.I. in developing emotional intelligence competencies. As stated by D'Alessio (2021), «Identifying training paths of emotional intelligence can be a powerful tool to manage micro and macro social processes marked by anger, hatred, and violence (e.g. interpersonal conflicts, wars, the phenomenon of haters on the Internet), contributing strongly to the sustainability related to the emotional and relational well-being of the planet». Latest scientific approaches emphasise the need to implement pathways to promote new inclusive educational models in the name of social sustainability. «Teaching emotions means moving beyond a static view of education, which focuses only on cognitive aspects at the expense of emotional ones, in favour of a comprehensive approach to education. This approach is based on the belief that educational practice should take into account both intellect and emotions, as well as the body and soul as a whole. Comprehensive education does not stop at literacy and subject-based education, but aims to understand and embrace others, appreciate the interconnectedness with nature, and navigate through complexities» (Buccolo, 2020). The exploration of various educational approaches in this work suggests a reflection on educational contexts and how to use technological advances to provide equal opportunities for access to knowledge and learning. This aligns with Goal 4 (SDGs) of the UN 2030 Agenda, which aims to "Ensure inclusive and equitable quality education and promote lifelong learning

opportunities for all." The Italian educational system has incorporated this objective by updating the 2018 National Guidelines with the "National Guidelines and New Scenarios", emphasising the importance of educating for sustainability across all disciplines. To support this, Law No. 92 of 2019 was enacted, which mandates the teaching of Civic Education at all levels of schools, with a specific focus on Citizenship and Sustainability, Citizenship and Constitution, and Digital Citizenship. The guidelines and laws align with one of the key principles of the 2030 Agenda, which is that sustainability is not only an environmental issue, but is achieved through an integrated approach to all aspects of development. «Considering sustainability in terms of education means delving into and creating significance from a perspective that values the design, organisation, implementation, and management of educational environments that promote long-lasting well-being» (Grange, 2017). This development is advanced through educational pathways, as outlined in Objective 4, by ensuring access to quality education for all.

«Moreover, education is intended as the "key" to uprooting poverty and favouring employment. This document promotes the commitment to eradicate all forms of exclusion and isolation, of disparities and inequalities in the access to and participation in quality education for all, with a view to permanent learning. To this regard, we are talking about introducing educational policies capable of generating improvements in learning results, focusing especially on the training of teachers and educators» (Vacchelli, 2017). By sharing this initial theoretical framework, A.I. could provide equal access to knowledge.

2. Research questions and hypotheses

This research started by considering the evidence from the literature, consisting of previous contributions and exploratory surveys on individual aspects concerning the main topic of this paper. According to a recent survey conducted by Mornin Consult on behalf of McGraw Hill in 2024, which looked at the impact of technology in education and in which 1,000 teachers from 19 countries participated, it emerged that 41% of teachers see A.I. as a positive element for education, and that generative artificial intelligence tools such as ChatGPT, are already adopted by almost one in three teachers (32%), revealing a certain familiarity on the part of the teachers interviewed regarding the use of such new information technologies. Another study carried out by the Centro Studi ImparaDigitale with the collaboration

of Quorum YouTrend, the results of which were presented in Bergamo on the occasion of the Stati Generali della Scuola Digitale on 24 November 2023, to which around 1,300 students across Italy responded, revealed that for 42% of the respondents, artificial intelligence can be used at school to provide learning experiences tailored to the different needs and abilities of students, thus revealing their confidence in the inclusive potential of such technology. Finally, in a questionnaire whose results were presented in Susana Benavente Ferrera, Micòl Beseghi and Adele Iozzelli's article on 'The Words of Annoyance' in 2023, «answered by 130 teachers, focusing on the self-perception that the participants revealed regarding their way of communicating in the classroom', it arose that teachers themselves lack a clear awareness of the implications that the words and expressions they use have in terms of emotional relational and motivational repercussions, showing that it is probably necessary to implement 'acceptable training of future teachers on these aspects, in which teachers can gradually develop their emotional competence as an essential professional asset and to establish relationships based on trust and mutual respect in the school environment».

In light of these studies, we wondered what the results would have been if a research study had been conducted in two suburban comprehensive institutes -one in Naples and one in Rome- on the use of artificial intelligence in the classroom. We also wanted to explore whether the current teaching methods adopted by teachers were already aimed at implementing emotional intelligence (E.I.) among students and whether there was a relationship between the introduction of E.I. at school and the development of E.I.-related skills. The research was based on the hypothesis that, within specific territorial contexts, the results for various aspects would show less positive percentages compared to the trends seen in previous studies. This suggests a pressing need for comprehensive teacher training on these aspects to effectively disseminate these technologies and teaching methodologies, and to maximise benefits for our learners. We strongly believe that such an educational strategy is essential for achieving a truly equitable and sustainable society.

3. Methods

After formulating and defining the research hypotheses, and specifying the purposes of the survey, a sample of the reference population was selected. The focus was on two comprehensive institutes in Naples and Rome, representing peripheral areas. An initial exploratory survey was conducted on this representative sample to gain an overview of the current situation. This involved administering a questionnaire to primary and secondary school teachers in the selected institutes. We used a questionnaire created with Google Forms. The questionnaire was distributed via email by the school secretariats, subject to the approval of the School Managers, for three reasons: it allowed participants to access and complete the questionnaire autonomously using any device, reducing the risk of it not being completed; self-administration minimised potential interference from psychological dynamics that could occur during an in-person interview. Using Google Forms enabled real-time monitoring of answer progress and automatic generation of corresponding trend graphs.

The questionnaire, which clearly stated its objectives in the preamble and guaranteed anonymity while ensuring that the results would be processed by the regulations in force, consisted of ten items with closed answers. A range of previously defined options was provided for. Behavioural questions were planned to retrieve indications from the interviewed teachers regarding facts and knowledge closely related to the topics under study. Finally, the questions were arranged to be ordered concerning the three central cores of our investigation: the use of artificial intelligence at school, E.I.-oriented teaching, and whether the use of A.I. can implement the learning of typical E.I. skills.

Before proceeding to the actual distribution of the questionnaire, a pre-test phase was conducted, subjecting the tool to a group of school orders being interviewed by teachers to test the parts and any critical aspects of the structured interview. This was done to practise the different parts of the structured interview and to identify any possible issues. Once we received their feedback, we proceeded with the actual administration phase. The data collection took about a week, after which we began analysing the data.

4. Data analysis

It should be noted that the answers of both institutions showed an almost negligible deviation, with uniform percentages for almost all the questions posed to teachers in the two cities. According to the data, only 10% of the sample interviewed knows A.I. well, while 50-60% have only some basic knowledge. In Naples, 57.1% of teachers use the Coding program to introduce computational thinking, the same in the Rome sample, with a preference of 72.7%. With a value of 77.3%, teachers surveyed agree on using A.I. as an opportunity for school inclusion, especially for students with special needs (B.E.S.), and to foster learning processes in the school curriculum. As for using programs to increase emotional intelligence (IEE), 50% are strongly oriented towards its promotion, while 40.9% are sufficiently oriented. The methodology of cooperative learning is confirmed, with a rate of 86,4% as the most used tool to develop this expertise, while 45.5% uses the 'Storytelling' methodology. Among the E.I. skills preferred by teachers are Self-motivation and Empathy, with 77% preferring to develop Self-motivation and 72.7% for Empathy. The survey revealed that 45.5% of the target group favoured using A.I. tools to promote and establish E.I. skills. However, 81.1% agreed with interactive programs to acquire emotional skills through virtual reality, 54.5%, and the use of robotics in teaching remains at 45.5%.

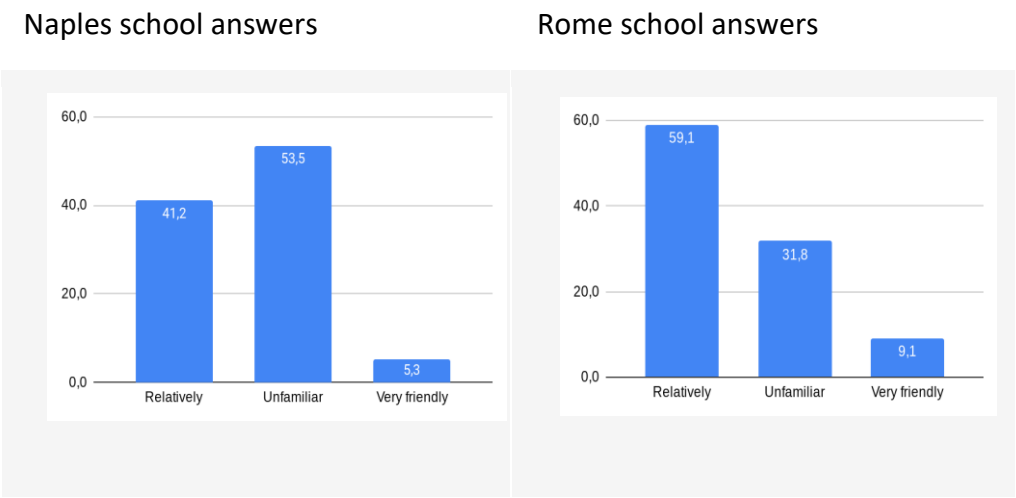
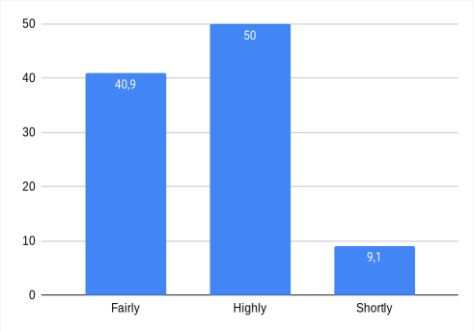


Fig. 1 - Familiarity of teachers with the use of AI. within their teaching

Naples school answers



Rome school answers

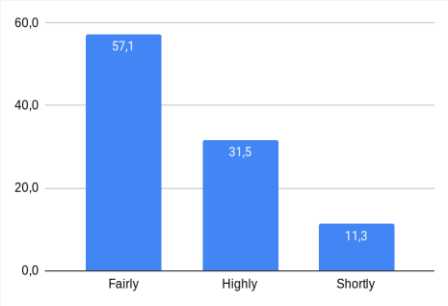
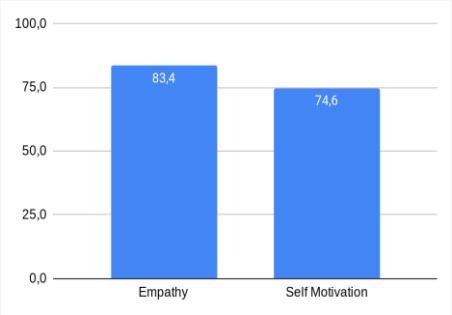


Fig. 2 - How much the teaching action is oriented towards acquiring the skills of emotional intelligence



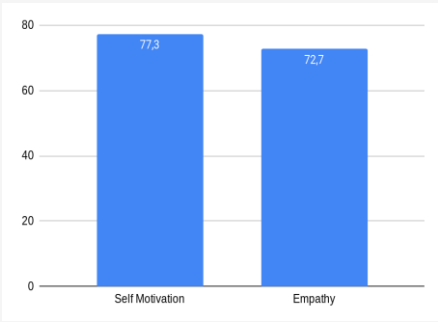
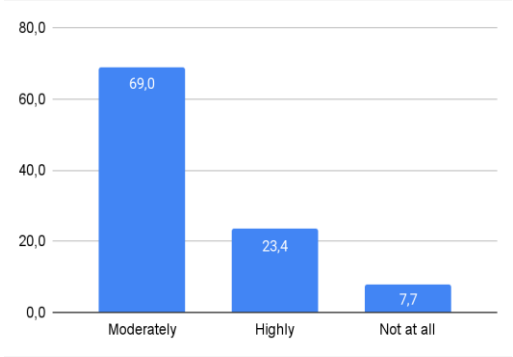


Fig. 3 - Which emotional skills are intentionally promoted in teaching

Naples school answers



Rome school answers

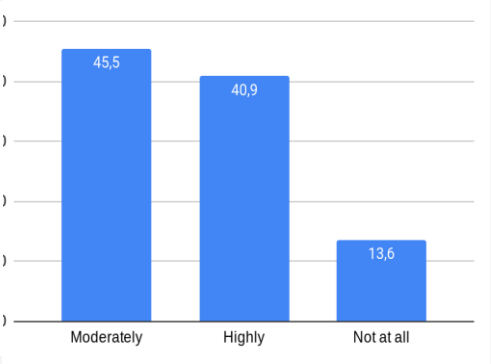
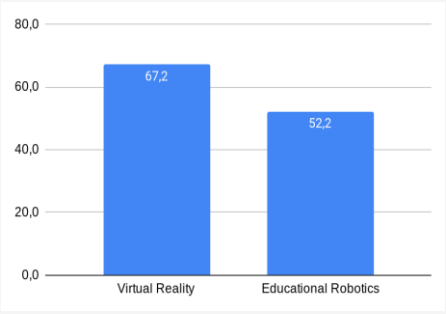


Fig. 4 - Propensity to use artificial intelligence for the acquisition of emotional intelligence skills in the teaching field



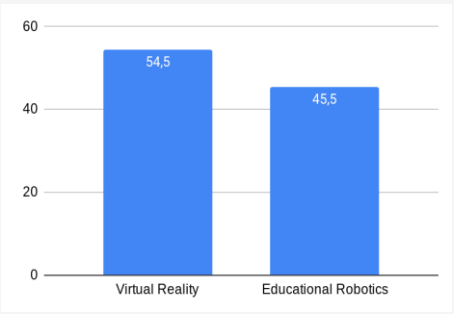


Fig. 5 - Which artificial intelligence application could be most suitable to achieve the aim of allowing the acquisition of emotional intelligence skills in the teaching sector

5. Discussion

The significant number of responses from the primary and secondary school teachers of the two surveyed schools has provided us with valuable initial insights into the scope of our investigation.

Regarding the first central theme of our investigation, the use of artificial intelligence in the classroom, it can confirm that, based on the theoretical framework and the initial research, the data collected indicate that education in these two institutions is still in the early stages of developing an effective teaching methodology that can exploit the full potential of artificial intelligence. Of course, an increase in teachers becoming more familiar with new information technologies and how to use them is expected. This is necessary to keep up with the progress being made in technology. Currently, a high percentage of teachers use coding to teach computational thinking to their students. This is a positive sign and will help students better understand and adapt to the continuous and rapid developments in information technology to which they are exposed. This would be even more relevant if block programming were further tailored for small to medium-sized educational robotics. The idea that integrating A.I. into school settings can significantly support inclusive learning processes in the curriculum is also supported by a previous survey. This emphasises the concept that a constructive and sustainable use of artificial intelligence applications enables the benefits of personalised teaching and learning to meet emerging special educational needs effectively. The second main theme of the study focuses on the extent to which the teaching methods currently used by the interviewed teachers are oriented towards emotional intelligence (E.I.). It is still unclear how to initiate a phase of more extensive professional development for teachers in terms of self-awareness about communication through verbal and non-verbal language. This is important for spreading soft skills to their students within their curricular disciplines. Currently, only about half of the teachers are strongly focused on directing their teaching towards the learning of skills related to emotional intelligence. In these cases, cooperative and storytelling methodologies are preferred to transfer emotional competencies such as empathy and self-motivation. In essence, the results of this investigation have confirmed the indications derived from the exploratory frame of reference.

As for the last thematic core, which is about teachers' inclination to use artificial intelligence to develop emotional intelligence skills, the questionnaire data confirmed our hypothesis that the use of A.I. for such purposes in schools in these two geographical areas is not yet fully developed. It has been found that a moderate attitude prevails in both institutions, probably because of the incomplete training of teachers on the possibilities offered by this information technology. Moreover, it is widely accepted that achieving the above purposes requires

leveraging virtual reality's interactive and immersive features combined with the potential of generative artificial intelligence to enhance human education to service persons and protect the common good.
However, it is essential to note that one of our research's weaknesses is the incomplete structure of the survey tool. It did not include questions about the age, level of education and discipline of the teachers interviewed. Furthermore, after critically examining our questionnaire, it would have been more beneficial for our research to use questions built according to the Likert scale.

Conclusions

After receiving feedback from a group of secondary school teachers about students' widespread use of A.I., we decided to conduct an investigation. The research aims to explore the potential use of artificial intelligence applications to develop emotional intelligence skills in students. An active and critical approach to new technologies has been encouraged to improve the accessibility and quality of education for a sustainable society. Surveys of teachers' attitudes towards A.I. and their attention to teaching emotional intelligence skills were analysed. It has been suggested that in two complete institutes in the suburbs of Naples and Rome, the results would show the need for more excellent teacher training to integrate these technologies and teaching methods effectively and to provide better education for students. The survey received many responses, confirming the hypothesis that using A.I. to develop emotional intelligence skills in schools in these two geographical areas still needs to be fully developed. The sample interviewed showed little familiarity with the use of A.I. in educational contexts but was familiar with the use of Emotional Intelligence, mainly promoted through the methodology of Cooperative Learning, to develop empathy skills and self-help motivation. On the other hand, teachers mostly recognised the coding program as a tool for initiating computational thinking. The survey revealed that teachers regard interactive engagement as crucial to developing emotional intelligence skills. They also see virtual reality as a valuable tool for improving emotional intelligence in education. The study emphasises the need to update teaching staff to keep pace with the increasing use of A.I. and provide training focused on the conscious use of this technology. Recent scientific literature suggests that attention should be paid to collaborative knowledge-building's pedagogical and educational aspects and the

promotion of equal access to education and training opportunities. Leveraging A.I. to develop emotional skills can support interdisciplinary learning and inclusive education, contributing to social sustainability and creating an accessible school environment (2022). The importance of the 4 goals of the 2030 Agenda is to ensure equal learning opportunities for all, focusing on the five Ps: People, Planet, Prosperity, Peace, and Partnership, which will be achieved through the 17 goals. It encourages everyone to consider the interconnectedness of the three dimensions of development: economic, environmental, and social. Therefore, interdisciplinary teacher training programs are needed for all levels and grades of education. The survey results indicate the need for training in A.I. to improve social skills and emotional intelligence in education. Training is critical to equipping teachers to educate students about the potential impact of using A.I. It is important to stress that the country's innovation system should depend on technological infrastructure and an integrated social infrastructure with local communities. This study is an initial exploration, and its implications serve as a starting point for further research on this subject. This requires more in-depth analysis to keep pace with rapid developments.

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