

EMOTIONAL ARTIFICIAL INTELLIGENCE: EVOLUTION OR REVOLUTION? WHAT SKILLS FOR TEACHERS AND EDUCATORS IN AFFECTIVE COMPUTING?

INTELLIGENZA ARTIFICIALE EMOZIONALE: EVOLUZIONE O RIVOLUZIONE? QUALI COMPETENZE PER INSEGNANTI ED EDUCATORI NELL'AMBITO DELL'AFFECTIVE COMPUTING?

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ABSTRACT

Among the skills included in the Compass for Tomorrow are new skills for teachers and educators in the context of emotional artificial intelligence. Is it possible to teach social-emotional skills? And how is it possible to do so? Can socio-emotional competences be considered as curricular standards? This contribution aims to answer these questions, highlighting opportunities and risks that the digital revolution and affective computing pose today.

Tra le competenze inserite nella bussola per il domani spiccano le nuove competenze per insegnanti ed educatori nel contesto dell'intelligenza artificiale emozionale. È possibile insegnare le competenze socio-emotive? E come è possibile farlo? Le competenze socio-emotive possono essere considerate alla stregua di standard curricolari? Il presente contributo ha l'obiettivo di rispondere agli interrogativi esposti, evidenziando opportunità e rischi che la rivoluzione digitale e l'informatica affettiva pongono oggi.

KEYWORDS

Emotional Artificial Intelligence, Social-emotional skills, Interiority. Intelligenza artificiale emozionale, Competenze socio-emotive, Interiorità

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Introduction

Scientific literature has shown that the emotional world marks every intellectual act and every action in our daily lives, so the affective-emotional-relational is increasingly becoming the “*conditio sine qua non*” of the cognitive. At this point, it is also necessary to rethink the educational and didactic role of teachers, who can no longer disregard the contribution of emotional artificial intelligence or *affective computing* and robotics itself in order to regain socio-emotional competences and thus be able to outline a training pathway that, by making use of intelligent agents, i.e. devices capable of perceiving the surrounding environment, undertake actions that maximise their teaching chances of success in the proper school environment.

1. The role of emotions in interpersonal relationships and learning

Modern culture, under the influence of psychoanalysis, psychology, pedagogy and sociology, supported also by the study of neuroscience, has highlighted the emotional root of human behaviour and identity, definitively recomposing the duality between feeling and reason of Greek thought.

Psycho-pedagogical research, in fact, has given great importance to feelings and emotions for the harmonious construction of the learner's personality. It was the theorists of constructivism, in particular Bruner and Vygotskij, who clearly affirmed the inseparability of emotional-affective-relational states from cognitive ones. Affectivity, understood as the sphere of feelings and emotional reactions, conditions learning and the cognitive processes themselves, because Plato already stated that the mind does not open if the heart has not first opened. Contemporary psycho-pedagogical culture holds that each individual is a dynamic organisation in which behaviour, communication, emotions and learning are in mutual interaction.

Today, it is precisely neuroscience that advocates the need to seriously address the issue of emotions for the improvement of relationships with oneself and others and for successful learning. For this reason, emotional literacy is being proposed to pupils as early as kindergarten, considering emotional capacities as fundamental as intellectual ones for effective learning. Children from an early age need to learn to manage their inner selves, emotions and feelings (Cambi, 1998, p.9), in order to be able to develop suitable interpersonal skills and achieve increasingly refined abilities to adapt to reality. Cambi writes: «Emotions, passions, feelings and affections have shown themselves - in every field: from personal identity to the organisation of knowledge - as the profound matrices of all culture, indeed -

perhaps - as the 'bricks' (the first 'bricks') on which it originates and is constituted» (*Ibid.*). Goleman (1996) also advocates the need for children to go through a process of emotional literacy in order to acquire those skills considered essential for life. In fact, the term 'emotional skills' refers to a child's ability to understand and manage his or her emotions. Emotional skills are a very important component of a child's socio-affective adaptation, as by learning strategies for coping with anger, fear, sadness, he or she will have more resources to react to adversity and to establish positive relationships with other people throughout life (Yadegaridehkordia *et al.*, 2019, pp.1-19).

The governing of emotions is the responsibility of the limbic system, the amygdala and mirror neurons. These allow the observer to understand the actions of others because he automatically mirrors them within himself. The ability to recognise the emotions of others is the essential prerequisite for empathy, the most important emotional competence (Hoffman, 2008, pp. 21-50)¹.

Goleman (1996) defines emotional intelligence as the ability to manage and monitor one's own feelings and those of others in order to achieve goals. He distinguishes between personal emotional intelligence, which concerns that ability to grasp the different aspects of emotional life (self-awareness, knowledge of one's own emotions, ability to monitor them, management of one's emotional space, self-control, ability to nurture one's own motivation) and social emotional intelligence, which refers to those characteristics that enable us to relate positively with others in an empathic manner, since empathy is the ability to grasp the other from within, it is valuing others and respecting diversity.

The individual capacity to manage one's inner world is acquired within the relationship. And it is precisely in relationships with others, constitutive of being a person, as Mounier teaches us, that one learns to think. Educating to emotions means offering the necessary opportunities to learn, identify, manage and modulate one's interiority. In this sense, the adult reference figures, parents, teachers and educators must characterise themselves as affectively available figures, and therefore in the relationship they must be open to listening, sharing and empathic tuning in order to promote constructive, adaptive and evolutionary changes in the subjects undergoing training. Goleman defines this as «the ability to motivate oneself and to persist in pursuing a goal despite frustrations; to control impulses and postpone gratification; to modulate one's moods, avoiding that

¹ Hoffman spoke of the affective roots of moral feeling for the formation of which empathy plays a decisive role in social behaviour as a preventive factor for aggression and violence.

suffering prevents us from thinking; and, again, the ability to be empathic and hopeful» (Goleman, 1996, p. 54). Recognising our feelings and those of others, managing our emotions positively, both inwardly and in social relationships, is useful both in school and out-of-school contexts. In fact, at school, learning comes about through a process that is affective-emotional-relational as well as cognitive together. The teacher who intends to help the pupil so as to realise the fullness of his or her educational potential must be moved by pedagogical love and must thus characterise himself or herself as an affective as well as ethical teacher, a teacher who, in addition to possessing skills in disciplinary, didactic and communicative content, must also acquire and exercise hermeneutic and transformative emotional-social skills that cannot be entrusted to personal sensitivity or to the spontaneity/ randomness of experience. Such competences, on the contrary, must be learnt as early as initial teacher training and, supported by a 'formative wisdom' and an 'emotional sensitivity', can connote themselves as a professional habitus and *modus operandi* in formal and informal school contexts (Dato, 2019).

Today, it is necessary to offer emotional education programmes in schools for the 4-7 and 8-13 age groups, through which pupils learn about the main emotions and learn effective cognitive and metacognitive strategies for managing negative thoughts and moods.

Animating teaching with the aid of technology means constantly providing *positive feedback* that can make pupils confident that they know how to do, that they can carry out tasks autonomously and choose, therefore, the possibility of playing an active role in their own learning process through the increase and enhancement of extracognitive variables (Pennazio, 2005) that are indispensable for meaningful and optimal learning.

If we take man as the starting point as the totality of rationality and emotionality and consider these two components as closely related, we can first of all understand the impossibility of separating them and considering one as supreme over the other and, secondly, we can see the need to structure a teaching/learning process anchored to the socio-cultural context in which man finds himself acting, a context currently permeated by the presence of technology.

From this point of view, the role played by didactic technologies, understood not only as facilitating/speeding up tools but also as motivational/emotional tools, is evident in the elaboration of individualised and differentiated paths that respect the times, the methods of access to knowledge as well as the cognitive-emotional styles and the dominant type of intelligence present in each pupil (*ibid.*). A path of

this kind will positively affect the process of acquiring knowledge, a process in which young people, subjects in training, will be animated by the pleasure of exploring, knowing, collaborating and learning through continuous discovery as they are stimulated in their curiosity and creativity, indispensable elements for appropriating knowledge through divergent, critical, open and plural thinking, predisposed to acquiring new knowledge. This will require, therefore, a disposition to abandon the technology-instrument binomial and to embrace that of technology-motivational/emotional strategy capable of creating contexts, unprecedented situations capable of actively involving the students, so as to make them feel protagonists of the learning process.

The use of information technology, if correctly set up, fosters the desire to learn and the willingness to work together; it encourages an increase in motivation in the learning process and also creates the possibility of knowing better and thus managing one's own thought and emotional processes through the creation of metacognitive and meta-emotional reflection environments. The technological environment can thus become a valuable resource for working on these emotional components, for acquiring new skills for thinking about emotions and experiencing them to the full.

Through the methodology of *cooperative learning*, it is possible to transform the classroom into an affective group where emotions move (Pennazio-Collacchioni, 2010), due to the bonds that are established between pupils engaged in the same experience, which will make it possible to move from an egocentric vision to an alterocentric one, aimed at enhancing the contribution of each individual and prosociality. By fostering cooperative work as a transversal effect, technology leads to the formation of a social vision of the world where each person has an important role to play and makes it possible to make good use of emotional intelligence by enhancing one's own individuality and combining it with the equally relevant individuality of others.

2. Emotions and meta-emotions

The school plays a fundamental role in the educational process: firstly, it should 'investigate' the boy's experiential world to understand any extracurricular difficulties, opening up a communication channel that would allow the learner to confront and expose any cognitive biases that push him to act in a certain direction and at the same time provide new and healthier interpretations of the emotions and events experienced.

Secondly, the school body should train itself so that it can deal with the learner's emotional education; it has already been mentioned how, by virtue of the supremacy of the limbic system, the adolescent can develop, even in response to normal life events, the phenomenon of 'emotional sequestration' in which the amygdala gets the better of the pre-frontal cortex and the acted over the thought. This can account for the most varied behaviour in adolescents, from tardiness and unjustified absences in school to aggressive or gang-like behaviour that results in bullying, but also more complex discourses (from reduced development of cognitive and intellectual capacities) that can lead to psychopathology as well as school failure.

With this in mind, it is important to teach adolescents to be aware of their emotions, 'mindsight' and educate them to act rather than 're-act' (Siegel, 2001; Siegel 2014)². The one who has best explored this issue in recent years is Joseph LeDoux (2003), a neuroscientist who has developed the 'two-way theory', in which he theorises that there are two routes to emotional learning a *low road* in which the stimuli perceived by the sense organs are conveyed to the thalami and from there subsequently to the amygdala, this pathway excludes the cortical areas and leads to a prompt reaction; a *high road* in which the sense organs send the information to the thalami and these to the cortex, only after cortical processing does the signal reach the amygdala, in which case the pathway has an extra step, namely the cortical areas that determine a reasoned action in the subject and not a simple reaction. The first path is certainly quicker but devoid of cognitive connotations, the second modulates the automatism of emotion with rationality, cognition and empowers the individual to decide the most correct action to take. It is only by educating young people to be aware of their emotions that serious help can be given to help them navigate the difficult world of emotionality and adolescent crises by providing an assist in the formation of a correct and robust identity. In this sense, specific training of teachers on concepts such as meta-emotions, emotional intelligence and *caring thinking* is first and foremost necessary to prepare the young person to experience and deal with his or her own emotionality.

The concept of meta-emotion expresses a second-order emotion consequent to and related to the primary emotion, a kind of secondary emotional response, e.g.

² Siegel in his essay *The Adolescent Mind* describes how adolescent behaviour is influenced by intense brain development.

anger, primary emotion and fear for the feeling of anger meta-emotion (Hooven *et al.*, 1997).

Dropping out of school, for example, is often the result of avoidance phenomena in response to experiences that lead to emotions perceived as negative and undesirable; hence the reason why it would be preferable to teach adolescents acceptance of their emotions and a correct way of processing them by attributing the right meaning. At the same time, the regulation of undesirable emotions must be reviewed, in other words, the adolescent may want to accept positive emotions and reject negative emotions (e.g. showing how in response to a negative event/emotion one can simply feel sadness instead of anger) and ultimately generate behaviour of avoidance and non-acceptance of the experience (Mitmansgruber, Beck, Höfer, Schüßler, 2009, pp. 448-453).

It was in this direction and on this basis that the first research project on meta-emotions education in schools entitled *MetaEmozioni - Scuola: per scuole emotivamente inclusive* (MetaEmotions - School: for emotionally inclusive schools) was carried out in A.A. 2017- 2018 involving 5 Italian cities, the Department of Pedagogical Sciences of Palermo with the support of the Guarantor Authority for Childhood and Adolescence and carried out with the collaboration of the *MetaIntelligenze ONLUS* team. The objective of this project concerned the development of emotional and meta-emotional intelligence to foster school and social inclusion by acting on skills such as recognising the non-verbal expression of emotions, emotional synaesthesia, understanding emotions, emotional management, and the genesis and use of emotions (D'Amico, 2018). For the students who took part, there was an increase in the aforementioned skills, but also better school performance and a positive process of socialisation and inclusion. Overall, the dual purpose of emotional literacy and the creation of an emotionally inclusive context that also involved the family was achieved.

And in this sense it would be incumbent on the school to work alongside the families with the aim of increasing the adolescent's ability to know himself, to teach him to understand and resist frustrations and failures and to respond to them in a constructive manner, increasing self-esteem.

So educating to emotions means educating the individual to know himself better, his own emotions, emotions on emotions (meta-emotions), learning not to be overwhelmed and distorted, to live them consciously, giving them a name and a face to be able to look at them with clarity, channelling impulses in a fruitful, constructive way and not simply chaotic and reactive. Educating on emotions

means change, 'mind-changing', like changing the individual's mind, teaching him or her a new approach, a new way of relating to one's own and others' emotions, processing them correctly and generating other positive emotions, establishing a self-powered cycle in which positive emotions are solicited and negative ones are curbed.

The ultimate *golden goal* would be the attainment of a state of emotional intelligence and consequent emotional competence. The American psychologist Goleman pioneered the study of emotional intelligence in the mid-1990s and emphasised its importance, stating that not only should we strive to link the intellect to emotions, but we should begin to consider emotions themselves as intelligent, capable of registering information of great importance, information that it is essential to take into account and process (Goleman, 1996).

This is important for the student's wellbeing in the personal and classroom spheres because it makes it possible to make full use of the ability to learn from positive emotions and to reflect on and react to negative ones.

So educating on emotions means offering the necessary opportunities to learn, identify, manage and modulate one's inner self. In this sense, it is appropriate that adult reference figures, especially teachers, should in their interpersonal relations open themselves up to listening to young people's experiences, to share, to empathic attunement in order to guide and promote constructive, adaptive and evolutionary changes in trainees. In fact, 'an empathic teacher,' writes Bellingeri, 'even just starting from the topics of conversation proposed by his pupils, can reawaken in them the faculty of recognising reality with wonder and a contemplative spirit; that which coincides with the rising power of thought. In the same way, by intuitively understanding and appreciating, with a 'well-disposed' mind and heart, their concrete interests, he can direct their will, so that they turn from themselves to understand the truth and love the good' (Bellingeri, 2010, p. 255). Only through a sympathetic relationship and empathetic communication can the educand be effectively helped to perceive and signify their state, emotions and thoughts (Fratini, 1998, pp. 170-190; Cambi 2015).

3. Emotional Artificial Intelligence and emotional competence: what relationship?

Over the years, artificial intelligence has been characterised by multiple developments in different fields, including that of Emotional Artificial Intelligence

(henceforth IAE), or *Affective Computing*, which is increasingly affecting many fields, in particular that concerning the importance of emotions in the human experience with reference to education and the educational-training context (Rivoltella 2020; Rivoltella-Rossi, 2019). In 1995, Rosalind Picard introduced the concept of 'affective computing' in her book entitled *Affective computing*, emphasising the importance of emotions in our daily lives. Recently, *affective computing* is increasingly characterising research topics in the field of education and training to the extent that the research aims of most *affective computing* studies are the design of systems/methods/tools for the recognition and expression of emotions and the examination of the relationships between emotions, motivation, learning style and cognition.

The integration of textual and visual channels is the most widely used multimodal channel in studies of *affective computing* (Picard, 2000). Dimensional theories/models are the preferred models for describing emotional states. Boredom, anger, anxiety, amusement, sadness, frustration, pride, despair, shame, happiness, fear, joy, interest are among the most important emotional states in the domain of education. Emotions can be regarded as individual experiences and responses that depend on the conditions under which they occur in human society (Dupre *et al.*, 2015, pp. 51-61). Emotions are certainly the essential part of every human being whose life, in everyday experience, is marked by the emotional state capable of influencing behaviour, thinking, decision-making and concerning well-being and the way human beings communicate with each other (Morrish, Rickard, Chin, & Vella-Brodrick, 2018, pp. 1543-1564; Neophytou, 2013, pp. 140-154).

The 'question of technology', which since the second half of the 20th century has questioned ethical-philosophical thinking, and more recently socio-psychopedagogical thinking, is posed as a questioning of the meaning of the transformations that new technologies imprint on our human experiences in our everyday lives. We are increasingly living in an era of 'technological domestication' (Pessina, 2023), as the philosopher Pessina puts it, and machines are becoming more and more familiar, we take them with us, we depend on them more and more for our work, our choices and our affections.

It is clear that in the face of this unprecedented scenario, the world of education and training cannot remain outside it, so much so that it is becoming increasingly involved to the extent that AI is taking on the role of the protagonist of digital technologies. The question then arises: what is the role of educators and teachers, i.e. those who primarily have to do with the education of the young? Can the educational-training system postpone the treatment of these issues to university

education, or should they be made the subject of in-depth study from the earliest years of schooling? (Cappello, 2017, pp. 31-44; Ranieri, 2019, pp. 9-35).

Let us say from the outset that schools must deal with AI and IAE, which teachers cannot do without in order to better train learners who in turn must be able to master digital skills in order to meet the challenges of the complexity of the world in which we live.

On the research side, on the other hand, the answer to the question of the school's function in relation to the treatment of these topics must be considered from the perspective of studies on the new *literacies* to which the sudden development of the digital world has given a significant impetus (Mills, 2010, pp. 246-271).

It should be pointed out that the use of AI in the educational-training world must be governed by ethical principles that must safeguard students' human rights, in particular, respect for and protection of privacy, non-discrimination, freedom of expression, but also fundamental freedoms such as the right to privacy and protection of one's personal data, since algorithms especially *machine learning* algorithms, are often accused of generating unfairness, interference in the private sphere, discrimination and, furthermore, the use of artificial intelligence systems for the management of information and content must avoid forms of polarisation and exclusion that may undermine the individual's ability to understand and participate in a democratic society (Fabris, 2018).

Recent European legislation on the development of the digital world and the AI revolution is also increasingly emphasising the need for citizens of the new millennium to master the conscious use of digital technologies including AI not only for education, but also for work, leisure, socialisation and civic participation in order to reap benefits and at the same time safeguard, through ethics, the rights of the human person, avoiding inequalities and promoting inclusion (Cataleta, 2021). A further indication that helps compose the picture and formulate a response comes from DigCompEdu, the framework that defines the roles, functions and competences of teachers and educators in digital matters (Redecker, 2017).

Among the skills included in the *Learning Compass* for Tomorrow are new skills for teachers and educators in the context of Emotion AI. By analysing text, video and audio data, *Emotion AI* is able to detect emotional signals from different sources (el Kaliouby, 2020). *Emotion AI* combines *affective computing* with Artificial Intelligence to detect, measure, understand and interpret human emotions. The technologies that contribute to making Artificial Intelligence 'emotional' are diverse, such as *Eye tracking*, the process that monitors eye movements to

determine where a test subject is looking, what they are looking at and how long their gaze lingers at a given point in space; *Emotion Analysis* that can detect from words the emotional state of the person who is talking to the virtual assistant and *Facial Expression Recognition* that is able to pick up from facial micro-expressions the different emotions a person may be feeling at that moment to extract useful information to understand what the human wants to express through their face (Lim, Mountstephens & Teo, 2020). In the era of the 'digital turn' (Ranieri, 2018, pp. 17-55; Ranieri, 2022; Ranieri-Cuomo-Biagini, 2023) and artificial intelligence, questions arise such as: is it possible to teach social-emotional skills? And how is it possible to do so? Can social-emotional skills be considered as curricular standards, such that they have to be taught first, and assessed later? (Tak, Gratch, 2023).

With regard to the first question, we can say that it was only at the end of the 1990s that this issue gained importance in teacher training, so much so that it has been increasingly focused on at the beginning of the third millennium, in the belief that the emotional dynamics characterising teaching and educational practice are fundamental (Sutton, Wheatley, 2003, pp. 327-358; Zembylas, 2005, pp. 465-487). Since teaching is a constitutively relational practice, it seems legitimate to speak of socio-emotional competences of the teacher, meaning by this expression not only the intrasubjective but also the intersubjective aspects of emotionality. We believe that the socio-emotional skills of teachers can certainly be useful to students, to their psychophysical well-being and can be spent on creating an empathetic climate within the classroom that can certainly positively condition the learning environment and the relational climate itself while at the same time fostering the motivation that underlies learning processes. All this provided that the teachers themselves are psychologically well and their emotional experience is one of well-being because the teacher's emotional experiences condition those of the learner so much so that it is scientifically proven that stressed teachers tend to have stressed students and this would be contagious in the emotional climate of the classroom (Schonert-Reichl, 2017, pp. 137-155). It has also been shown that a teacher's emotional difficulties have a significant impact on the teacher-learner relationship and can often lead the same teacher to burnout with detrimental effects on students (Jennings, Greenberg, 2009, pp. 491-525; Ghanizadeh, Jahedizadeh, 2015, pp. 24-39).

Having said all this, it can certainly be said that the use of artificial intelligence can support the teaching of socio-emotional skills provided that exploratory and didactic contexts are structured that are capable of promoting, through the new alphabets of *Media Literacy*, the critical, ethical and aesthetic dimension of New

Media Education (Rivoltella, 2020). Therefore, the use of AI systems in an ethical manner can certainly be positive for one's own and others' well-being while respecting privacy and online safety, thus avoiding misuse that can damage physical and mental health as in the case of cyberbullying.

Artificial intelligence can play a significant role in supporting the teaching of social-emotional skills through different methodologies such as: *personalisation of learning* as AI systems can adapt teaching materials and activities according to students' individual needs, helping them to develop social-emotional skills at a pace that suits their learning style and developmental level.

Another effective way can be *personalised feedback*, as AI algorithms can provide *personalised feedback* to students on how to manage their emotions, improve their communication skills and build positive relationships with others in formal and informal educational learning contexts.

Another interesting methodology involves simulations and role-playing in which AI-based simulations can be used to put students in realistic scenarios that require the application of social-emotional skills such as conflict resolution, collaboration and empathy. This provides them with a safe environment to explore and practise these skills.

Furthermore, AI *algorithms* can be trained to recognise students' facial expressions and emotions during classroom interactions or through digital tools, helping teachers to detect any signs of distress or emotional difficulties (Pancioli-Rivoltella, 2023).

Virtual tutors, based on AI, can also be useful insofar as they guide students through social-emotional learning activities, offering suggestions, resources and personalised support during the educational-training process. Given the importance of considering, in research as well as in practice, the socio-emotional dimension of teaching, supported by educational robotics, it becomes relevant to focus the training action to support the development of social and emotional competences in developmental age subjects, and in their educators, by intentionally arranging a series of attentions and interventions that harmonise with the customs of those who care for young people and their growth, in the knowledge, as now scientifically proven, that interest in social-emotional skills leads to improvements in terms of reduction of inadequate behaviour of learners, increase in inclusive attitudes (Daniela- Lytras Miltiadis, 2019, pp. 93-100; Bennett *et al*, 2024, pp. 1566-1567) and improved academic achievement.

Furthermore, it is possible to continuously monitor data on student interactions and socio-emotional learning outcomes through artificial intelligence algorithms, allowing teachers to assess student progress and make any necessary adjustments to teaching activities.

However, it is important to note that the use of AI in teaching socio-emotional skills must be guided by sound ethical and pedagogical principles, ensuring that AI is used to enhance the educational experience of students and not to replace the role of teachers or compromise their safety and privacy.

Artificial intelligence (AI) is revolutionising, including through robotics, (AA.VV., 2023; Malavasi, 2019), the education sector, offering new opportunities and challenges for both teachers and students. AI can create personalised learning experiences, adapting to the specific needs of each student. It is important to emphasise the pairing of pedagogical love-competence that, supported by AI and robotics, can unleash the means to enjoy the opportunities and possibilities that life continues to hold for the disabled, marginalised and troubled. The socio-emotional skills of the educator, together with the aid of AI, represent the possibility for these less fortunate people to become men, or rather more men, fully realising their humanity. For example, VEX 123 is an interactive, programmable robot that offers an experiential approach to learning. Students can see the content presented in an engaging and relevant way. Working with VEX 123, students learn to communicate with each other, collaborate and use critical thinking. One of the main advantages is that VEX 123 transfers computer science from the screen to reality, actively involving students. For example, students sequence button presses to make the robot move along a drawn path, experiencing both positive and negative emotions during the process. Through trial and error, they eventually reach their goal and experience the satisfaction of such an achievement. In addition, VEX 123 incorporates the SEL aspect into the curriculum, for example through 'Act' commands that make the robot act in a way that expresses specific emotions, providing opportunities for discussion of emotional expressions. It also provides immediate and targeted feedback, helping students to better understand their emotions and develop emotional awareness (Ma - Zhang, 2023).

Conclusions

Beyond utopias and dystopias, this essay assumes, therefore, as an ethical-pedagogical perspective, that of the user of the new technological artefacts in the conviction that the AI revolution, correctly set up, can certainly be of help in the

teaching-learning process and therefore in the formation of the personality of students, and in particular of those in difficulty, overcoming the polarisation of defenders or opponents to the bitter end and following what Pessina indicates as the 'third way' insofar as it «proposes to "regulate" the use of technology, to "moralise" it, or even "humanise" it, with the aim of mitigating possible damage and defeating the discomforts of civilisation caught in the whole area of thought that does not seem entirely convinced of the promises of well-being» (Pessina, 2023, p. 25). What we should fear is not the progress of technology but rather technological absolutism that practices the progressive subtraction of human faculties in favour of technological apparatuses, algorithms and neural networks with arbitrary encroachments on our interiority (Crippa-Girgenti, 2024).

References

AA.VV. (2023). *Arrivano i robot. Riflessioni sull'intelligenza artificiale*. Novara: Interlinea.

Bellingreri A. (2010). *La cura dell'anima. Profili di una pedagogia del sé*. Milano: Vita e Pensiero.

Bennet A. et al. (2024). "Special Education Teachers Evaluating the Accessibility of CS Educational Robotics", in *Atti del Convegno 55th ACM Technical Symposium on Computer Science Education*, vol. 2, pp. 1566–1567.

Cambi F. (1998), (ed.). *Prefazione a Nel conflitto delle emozioni. Prospettive pedagogiche*. Roma: Armando.

Cambi F. (2015). *La forza delle emozioni: per la cura di sé*. Pisa: Pacini.

Cappello G. (2017). "Literacy, media literacy and Social Change. Where Do we go from now ?", in *Italian Journal of Sociology of Education*, 9, 1, pp. 31-44.

Cataleta M.S. (2021). *Diritti umani e algoritmi. Dal regolamento UE sulla protezione dei dati alla proposta di regolamento UE sull'intelligenza artificiale*. Roma: Nuova Editrice Universitaria.

Crippa M., Girgenti G. (2024). *Umano, poco umano. Esercizi spirituali contro l'intelligenza artificiale*. Milano: Mondadori.

D'Amico A. (2018). *Intelligenza emotiva. Pillole metaemotive per vivere meglio*. Milano: San Paolo.

Daniela L., Lytras Miltiadis D. (2019). "Educational Robotics for Inclusive Education", in *Technology, Knowledge, and Learning* 24(3), pp. 93-100.

Dato D. (2019). *L'insegnante emotivo. Formare tra mente e affetti*. Bari: Progedit.

Dupre D. et al. (2015). "Oudjat: A configurable and useable annotation tool for the study of facial expressions of emotion", in *International Journal of Human-Computer Studies*, vol. 83, pp. 51-61.

el Kaliouby R. (2020). *Girl Decoded, My Quest to Make Technology Emotionally Intelligent – and Change the Way We Interact Forever*. UK: Penguin.

Fabris A. (2018). *Etica per le tecnologie dell'informazione e della comunicazione*. Roma: Carocci.

Fratini C. (1998). "La relazione allievo-insegnante: un modello di comprensione psicoanalitico", in F. Cambi (ed.). *Nel conflitto delle emozioni. Prospettive pedagogiche*. Roma: Armando

Ghanizadeh A., Jahedizadeh S. (2015). "Teacher burnout: A review of sources and ramifications", in *British Journal of Education, Society & Behavioural Science*, 6(1), pp. 24-39.

Goleman D. (1996). *Intelligenza emotiva Che cos'è, perché può renderci felici*. Milano: Rizzoli.

Hoffman M.C. (2008). *Empatia e sviluppo morale*. Bologna: Mulino.

Hooven C. et al. (1997). *Meta-emotion*. New York: Lawrence Erlbaum Mahwah.

Jennings P.A., Greenberg M.T. (2009). "The prosocial classroom: Teacher social and emotional competence in relation to student and classroom outcomes", in *Review of educational research*, 79(1), pp. 491-525.

LeDoux J. (2003). *Il cervello emotivo. Alle origini delle emozioni*. Milano: Baldini Castoldi.

Lim J.Z., Mountstephens J., Teo J. (2020). "Emotion Recognition Using Eye-Tracking: Taxonomy, Review and Current Challenges", in *Sensors*, 20, 2384.

Ma F., Zhang Z. (2023). "The case study on vex robotics curriculum system of vex academy based on steam education", in *Atti della 17th International Conference Technology, Education and Development*, 6-8 March, Valencia..

Malavasi P. (2019). *Educare robot? Pedagogia dell'intelligenza artificiale*. Milano: Vita e Pensiero.

Mills K.A. (2010). "Areview of the "Digital Tourn" in the new Literacy Studies", in *Review of Educational Research*, 80, 2, pp. 246-271.

Mitmansgruber H., Beck T.N., Höfer S., Schüßler G. (2009). "When you don't like what you feel: Experiential avoidance, mindfulness and meta-emotion in emotion regulation", in *Personality and Individual differences*, 46 (4), pp. 448-453.

Morrish L., Rickard L.N., Chin T.C., Vella-Brodrick D.A (2018). "Emotion regulation in adolescent well-being and positive education", in *Journal of Happiness Studies*, 19(5), pp. 1543–1564.

Neophytou L. (2013). "Emotional intelligence and educational reform", in *Educational Review*, 65(2), pp.140–154

Panciroli C., Rivoltella P.C. (2023). *Pedagogia algoritmica. Per una riflessione educativa sull'intelligenza artificiale*. Brescia: Scholè.

Pennazio V. (2005). "Variabili extracognitive e tecnologie. Come sviluppare l'intelligenza emotiva attraverso le tecnologie", in *Form@are*, n. 35.

Pennazio V., Collacchioni L. (2010). *Emozioni in movimento. Teoria, attività didattiche, laboratori*. Genova: Ecig.

Pessina A. (2023). *L'essere altrove. L'esperienza umana nell'epoca dell'intelligenza artificiale*. Milano: Mimesis.

Picard R.W. (2000). *Affective Computing*. Cambridge: MIT Press.

Ranieri M. (2018). "La 'svolta digitale' negli studi sulle nuove literacy ed implicazioni educative", in Id. (ed.). *Teoria e pratica delle new media literaces nella scuola*. Roma: Aracne.

Ranieri M. (2019). "La media literacy education tra vecchie e nuove sfide in un mondo iperconnesso", in M. Gui (ed.), *Benessere digitale a scuola e a casa. Un percorso di educazione ai media, nella connessione permanente*. Firenze: Mondadori Università.

Ranieri M. (2022). *Competenze digitali per insegnare. Modelli e proposte operative*. Roma: Carocci.

Ranieri M. Cuomo S. Biagini G. (2023). *Scuole e intelligenza artificiale. Percorsi di alfabetizzazione critica*. Roma: Carocci.

Redecker C. (2017). *European Framework for the Digital Competence of Educators*. Luxembourg: DigCampEdu, Publications Office of the European Union.

Rivoltella P.C. (2020). *Nuovi alfabeti. Educazione e cultura nella società post-mediale*. Brescia: Scholè.

Rivoltella P.C., Rossi P.G. (2019). *Il corpo e la macchina. Tecnologia, cultura, educazione*. Brescia: Morcelliana.

Schonert-Reichl K.A. (2017). "Social and emotional learning and teachers", in *The future of children*, 27(1), pp. 137-155.

Siegel D.J. (2001). *La mente relazionale. Neurobiologia dell'esperienza interpersonale*. Milano: Raffaello Cortina.

Siegel D.J. (2014). *La mente adolescente*. Milano: Raffaello Cortina.

Sutton R.E., Wheatley K.F. (2003). "Teachers' emotions and teaching: A review of the literature and directions for future research", in *Educational psychology review*, 15(4), pp. 327-358.

Tak A., Gratch J. (2023). "Is GPT a Computational Model of Emotion?", in *Conference: 2023 11th International Conference on "Affective Computing and Intelligent Interaction"*. Cambridge: MIT Media Lab.

Yadegaridehkordia E. et al. (2019). "Affective computing in education: A systematic review and future research", in *Computers & Education*, Vol. 142, 103649, pp. 1-19.

Zembylas M. (2005). "Beyond teacher cognition and teacher beliefs: The value of the ethnography of emotions in teaching", in *International journal of qualitative studies in education*, 18(4), pp. 465-487.