"MAKE WAY FOR EMOTIONS!" PHYSICAL AND VIRTUAL SPACES AS CATALYSTS OF EMOTIONAL EXPERIENCES

"FATE LARGO ALLE EMOZIONI!" LO SPAZIO FISICO E VIRTUALE COME PROPULSORE DELL'ESPERIENZA EMOTIVA

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ABSTRACT
Kahn envisions educational spaces as "a man under a tree, with listeners around him hearing the words of his mind," capturing its deep emotional essence. The creation of a welcoming environment enables learners to savour all the emotional stimuli at play. This study explores how leveraging the opportunities provided by physical and virtual spaces can create an atmosphere conducive to the development of socio-emotional competence, enhancing the holistic well-being of those who inhabit them.

Kahn immagina gli spazi educativi come "un uomo sotto un albero, e intorno a lui gli ascoltatori delle parole della sua mente", catturandone la profonda essenza emotiva. La creazione di un ambiente accogliente permette agli apprendisti di assaporare' tutti gli stimoli emotivi che entrano in gioco. Tale studio esplora come sfruttare le possibilità date dagli spazi fisici e virtuali, creino un'atmosfera favorevole allo sviluppo della competenza socio-emotiva, migliorando il benessere olistico di chi vi dimora.

KEYWORDS
Inclusive environment, affective systems, emotional competence.
Ambiente inclusivo, sistemi affettivi, competenza emotiva.

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1. Synergizing Architecture and Pedagogy to enhance socio-emotional learning

The engraving at the entrance of Plato's Academy in Athens "let no one ignorant of geometry enter" epitomises the effort, entirely Western, from ancient Greece to Einstein's insights, of wanting to give a regular and orderly geometric shape to key concepts such as space and time, so much so as to consider geometry the foundation of intellectual discourse and philosophical thought (Capra, 1989). Indeed, the effort to frame the world within unambiguous and constant criteria (Beck, 2001) resonates through the annals of human thought, underscoring humanity's enduring pursuit of clarity and coherence in understanding the world around us. In his introduction, Beck (2015) asserts that the vagueness of And in our world is the:

> farewell to order, its overflowing chaos, its extravagant hope for unity, its helplessness in the face of merely additive growth, its limits and limitlessness, the increasingly illusive borders and the anxiety that they arouse all that lures and thrills in And.

The either-or, the versus, the dichotomy create boundaries and reveal horizons; in short, they help avoid the void, the sense of indeterminacy resulting from the complexity of the times we are immersed in. Thoreau's suggestion, as quoted in Pancioli and Rivoltella (2022), invites us to navigate through the free and wild places made up of many "ands" of emotions and algorithms, physical and virtual spaces, emotional and artificial intelligences. A play of opposites that recalls the "Calvino Method" (Prencipe & Sideri, 2023) by proceeding with seemingly oxymoronic concepts to decipher complexity through dialectics. According to the authors, this is a useful tool to address complex themes such as the topic of artificial intelligence and its implications.

This approach allows for the integration of diverse and distant disciplines, facilitating synthesis between previously separated fields of knowledge. Interdisciplinary synergy, promoted by the advancement of artificial intelligence, represents an unprecedented opportunity for convergence and interaction between previously fragmented areas of knowledge. This study aims to explore how the dialectic between architecture and pedagogy can contribute to the creation of educational environments, both physical and virtual, capable of

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facilitating dialogue between emotions and algorithms to trigger the process of emotional empowerment in students and the educational community.

2.Exploring the influence of space on socio-emotional learning

The evocative vision of architect Louis Kahn of "a man under a tree and around him the listeners of his thoughts" (1969 in Hubert, 1992, p.37) evokes an intimate and significant relationship between the spatial context and the educational experience, highlighting how the environment can influence and enrich the learning process. It goes beyond the mere functionality of educational spaces and emphasises the ability of architectural environments to inspire, nourish, and facilitate the educational process, not only intellectually but also emotionally and socially, as places of inspiration, reflection, and personal and collective growth. This place, as an educational space, marks the endpoint of a long descriptive journey and at the same time, the starting point of an equally broad and articulated discourse, both inductive and deductive. The term 'educational space' corresponds to a meaning according to which the space will appear somehow educative, assigning to this a peculiar and at the same time polyvalent semanticisation (Gennari, 1997).

In this sense, space acts as an object of attention and personal characterization. At times, it plays a protective role, where it establishes a context capable of adapting to the changing needs of its members (Cancrini, 1981). Thus, space can be defined as a pedagogical space within which relationships are structured and relational systems are built, leading to full realization, personal development, and social inclusion. Before delving further into this reflection that bridges the design of educational spaces and socio-emotional learning, it is necessary to delineate what is intended by socio-emotional competence and its relevance today.

In literature, socio-emotional education constitutes a major challenge aimed at combining personal well-being and emotional development. It is important, first and foremost, to focus on the concept of emotions, as a complex state of feelings, which contribute to the successes of learning, the internalization of knowledge and meanings, the improvement of the personal experience of the adult who learns and transfers and applies in their professional field the results of what they have learned by involving their emotional resources (Stefanini, 2013). In this socio-emotional learning scenario, emotional intelligence involves the ability to perceive,

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evaluate, and express an emotion to access feelings and create them when they facilitate thoughts. It also enables emotional knowledge and emotional regulation to promote intellectual growth through socio-emotional skills.

Drawing from the seminal works of Le Doux (1986), Salovey and Mayer (1990), and culminating in Goleman's pivotal contribution in 1995, emerges the concept of emotional intelligence - a fundamental cornerstone in the fabric of human experience, dedicated to the pursuit of well-being. This evolving line of research illuminates the critical role of emotional intelligence in navigating life's complexities, underscoring its profound significance in personal and interpersonal realms alike. Not by chance, emotional intelligence is understood as "a set of attitudes and abilities that manifest themselves in the knowledge of one's emotions, in restraining one's impulses, in reading the emotions of others, in finding and developing one's motivations, and in managing one's interpersonal relationships" (Forziatti et al., 2004, p. 37, authors' translation).

Gardner (1993) clarifies that emotions, at first, assume the status of true expressions of intelligence, including both *intra*personal and *inter*personal intelligence. The former is considered as the ability to access one's own feelings, represent them, and use them as a key to interpret one's behaviour. The latter refers to the ability to understand others' feelings and act accordingly. It is interesting how these forms of intelligence have begun to play a fundamental role in learning to the extent that many education systems worldwide have introduced socio-emotional learning, better known as SEL, in their curricula (1994).By integrating the development of social and emotional skills, socio-emotional education aims to enhance and manage crucial emotional experiences, to reflect on moods, with the aim of understanding the different emotional responses of each individual. SEL aims to provide individuals with practical tools to navigate the world of emotions in a healthy and productive way, contributing to emotional well-being and interpersonal relationships, and being closely connected to physical and virtual spaces, it elicits different emotional responses. Therefore, in these programs, the focus is on teaching the socio-emotional skills that can be categorised in five areas of competence: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. These competencies are developed with the aim of dealing with problem effectively, facilitating creative thinking, and directing one's attention to new priorities (Salovey & Mayer, 1990). In turn, these skills become indispensable resources which the students can elaborate and use

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effectively to enrich and master their socio-emotional competence. Schools can therefore become a resource to build a path of rediscovery and appreciation of the emotional world of the individuals involved in the educational process; it can acquire the image of a meeting place for the exchange of deep, and sometimes unknown, parts, where one can be free to look in the mirror and develop that path of self-awareness that is fundamental to the formation of the sense of one's personal effectiveness (Forziati et al., 2004).

Le Boterf (1990), on his part, defines competence as "a recognised and proven set of representations, knowledge, skills, and behaviours mobilised and combined in a relevant manner in a given context." Representations, knowledge, skills, and behaviours can be summarised by the term resources, leading us to affirm that competence is a specific quality of the individual: that of being able to combine different resources to manage or effectively confront situations in a given context (Le Boterf, 1990). Alongside these, emotional competence emerges, considered as the understanding of one's own emotions and those of others, of which Gordon (1989) initially provided a definition, describing it as a set of knowledge and behavioural skills that have a strong connection between culture and emotions themselves. In turn, the concept of social competence is tied to this, conceived as effectiveness in interaction, as defined by Rose-Krasnor (1997). Through the image of a prism, its complex and multifaceted nature includes multiple skills, among which are regulatory, expressive, and empathetic abilities.

Since our actions are determined by emotions, every individual needs to develop and master the necessary competences to cope with change and be more intentional in creating useful relational connections. The approach on which socio-emotional intelligence is based asserts that individuals are better able to adapt physically and psychologically to their environment when they effectively capitalise their emotions (Petrides & Furnham, 2000).

In schools, emotions come into play as learning facilitators, useful tools for anchoring study to curiosity, exploration, and engagement. "In the teaching practices of educators, [emotions] become useful tools for engagement and participation, generating emotions in turn" (Blandino, Granieri, 1995).

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3. Spaces, Learning, Emotions: Insights for Innovative Design

Today, schools, as the primary educational settings for fostering the acquisition of knowledge, skills, and attitudes, have the significant responsibility of reflecting on socio-emotional learning. It is here that space, understood architecturally, gains meaning, adapting to the needs of the time and relationships. The physical configuration intersects with the emotional and social, linking the culture of both the designer and the inhabitants of that space. It's no coincidence that Gennari (1997) writes, the arrangement of furniture inside the house, the location of the play area for children in the house, the placement of schools in neighborhoods, all refer to a conception of the material use of places, *topoi*, and simultaneously to the cultural meanings that affect both the experience and the experientiality, that is, the experiential nature of the space by those who live in it.

Can architecture open us up to emotions? To answer this question, it is useful to introduce the concept of "architectural atmospheres", understood as a state of resonance and identification (sensorimotor, emotional, and cognitive) between an individual and the surrounding built environment (Canepa et al., 2019). Yes, we can empathise with spaces, and according to the RESONANCE study, we can also measure this emotional impact. A dialogue between architecture and neuroscience gives us a very interesting picture of how architectural space can generate emotional, cognitive, and neurophysiological feedback in people. Atmospheres prove to be a central, yet perhaps still underexplored, part of architecture.

According to Camillo Boito (1972) architecture is, among all the arts of design, the most boring to hear about. On the other hand, Renzo Piano's (2010) definition of practicing architecture provides a completely different perspective. In his opinion, architecture means constructing buildings for people: universities, schools, concert halls. They are all places that become outposts against barbarism. They are places to be together, to cultivate culture and art. Art has always lit a spark in the eyes of those who engage with it. He adds that architecture is also creating silence, in other words, building emotion. Sometimes architecture seeks silence and emptiness where our consciousness can find itself. Silence is a bit like darkness: one must have the courage to look into it, and then slowly one begins to see the outline of things. So, for Piano (2010), architecture is also the art of creating places for silence, for meditation.

The concept of silence in architecture leads us hand in hand to the idea of emptiness in education, as it emerges in Plato's Symposium from the dialogue

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between Socrates and Agathon, the teacher and the student. Recalcati (2014), much like Lacan (1971) had already done, revisits this dialogue, highlighting the importance of "producing emptiness" to make the creative process possible.

Knowledge isn't water flowing from the fullest cup to the emptiest one; the model that emerges from Recalcati's reflections on learning isn't about a void to fill but rather a void to open because, sometimes, one must forget what they already know to create something of their own and unique. Thus, the silence of architecture and the emptiness of learning become tools capable of bringing out emotions and fostering creativity.

Creative empathy is the process that connects emotions and creativity and is the design manifesto that drives Mario Cucinella's architecture. Certainly, from the study and observation of his works, the fundamental themes of his design emerge: sustainability, enhancement of the cultural and social context, technological innovation in service to the community, well-being of people, connection with nature, and active involvement of users in the creative process. It is useful to refer to this *modus operandi* to investigate how architecture, not enslaved to form and/or function alone, can design educational spaces capable of fostering a protective atmosphere that allows students to recognise, manage, and express a wide range of emotions, almost as if they were in the shade of a tree with a dense canopy.

An interesting example is certainly represented by the Guastalla Nursery: a sustainable, welcoming, and safe space in which to explore the world. The nursery is a place entirely made with natural and recycled materials with low environmental impact, rich in sensory stimuli. Architect Cucinella, inspired by the belly of the whale as told in Pinocchio, envisioned an environment where all children could collect positive memories. This structure demonstrates how space, before being physical, is the result of a psychological, cultural, and educational space. Certainly, architecture, as traditionally understood, has focused on the elements of matter and physicality, which, even in the context of profound change facilitated by new technologies, must remain fundamental aspects of design, especially when we talk about projects destined for the world of education.

The studies of the French psychologist Liliane Lurcat (1999), which investigate the relationship between the child's physicality and space and objects, remain very interesting. According to Lurcat, the child discovers space through two main sources of learning: direct experience and interaction with the linguistic environment surrounding them. Their practical knowledge of space is primarily

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based on active exploration and manipulation of objects. Simultaneously, the environment contributes to their understanding of space by providing names for objects and places, as well as through instructions and prohibitions. Thus, there is a dialogue between space and the body that, in the current context, can be expanded, modulated, and personalised through the use of technological innovations. Space, or rather physical, digital, and hybrid spaces, speak to us, communicate with us, and among themselves. This is the great revolution we are experiencing; things are no longer inanimate objects but have a life of their own and are capable of interacting with us in ways never seen before.

We are immersed in "Everyware," which is the pervasive spread of digital technologies in everyday life and surrounding environments. Devices and computer systems interact invisibly with users and the environment, facilitating continuous interaction between the digital and physical worlds and introducing new challenges and opportunities in the field of environment design. A paradigm shift is underway, and it could be even more useful and evident in educational environments.

Recalcati (2014), in his book “L’ora di lezione”, refers to a common feeling expressed by teachers of speaking to the walls stating that, in reality, this is not an experience devoid of consequences. In fact, according to Lacan, the words directed at the walls have the property of reverberating (Recalcati, 2014) because they generate a different kind of knowledge from the words spoken by the teacher: they activate the student's subjective resources. What would happen if the walls could speak instead? Could this amplify the process of subjectivation initiated by the teacher?

A few years ago, it might have seemed like a mere provocation. Instead, today, it appears to be an almost desirable reality in every educational context. Mark Weiser, an American computer scientist in the late 1980s, coined the term ubiquitous computing (Ratti, 2017, p.23), envisioning that as technology advanced, screens would disappear, foreseeing the pervasive integration of technology into the surrounding environment. Today, this scenario is becoming a reality with the spread of interactive devices and systems that transform surfaces into spaces of digital interaction. Imagining the wall as an interactive medium, opens the door to a new way of conceiving educational environments and learning dynamics. This new paradigm offers endless possibilities in the educational context, allowing teachers to create dynamic and engaging environments that foster active and personalised learning. Interactive walls could be used to display educational

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content in an engaging manner, encourage collaboration among students, and provide immersive learning experiences.

A tangible example of how environments, once empty boxes, can be transformed into places of interactive and engaging learning is provided by the experience of the artistic collective teamLab from Tokyo, known for its immersive digital installations. A team of artists, programmers, engineers, animators, mathematicians, and architects transforms physical spaces into interactive environments where the visitor becomes an integral part of the artwork itself. Through interaction with digital works, visitors are immersed in a unique educational experience, where they can explore complex concepts in an intuitive and stimulating way.

Fig.1 – Team Lab-San Francisco- https://www.teamlab.art/it/e/

This approach to learning could be used to transform educational spaces into dynamic and interactive environments, where students can explore, be excited, experiment, and learn in innovative ways. Isn't it the task of art to stimulate imagination and inspire?

> Instead, we believe to achieve change, it is necessary to unlock people's imaginations and apply it to all areas of life at a microscale. Critical design, by generating alternatives, can help people construct compasses rather than maps for navigating new sets of values (Dunne & Raby, 2013, p.44).

The need to unlock people's imagination and apply it to all sectors of life is a fundamental premise for any significant change. In this context, our proposal to rethink educational spaces stands as an attempt to generate creative and concrete alternatives. Through the use of accessible resources and the integration of

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innovative technologies such as artificial intelligence, seemingly ordinary spaces can be transformed into extraordinarily engaging educational contexts.
In the context of Italian school buildings, large architectural projects like those by Cucinella and innovative works by TeamLab may seem distant, but they can offer us a compass for change. Faced with the complexity of current challenges, it is useful to invoke the principle of simplicity, as proposed by Sibilio in the field of education, and apply it to the design of educational spaces. This approach involves the use of strategies and devices that value differences and fully utilise the resources available in educational environments. Finding simple design solutions, using the principle of vicarious use, that is, a different use of objects and spaces, especially uncodified and modifiable spaces. In practice, it means adapting educational environments to the specific needs of students and teachers, making the best use of the potential offered by space itself (Sibilio, 2017). Is it a feasible proposal?
Le scuole italiane spesso presentano aule spoglie, come semplici cubi bianchi, un'osservazione che richiama il paradosso sollevato da Paolo Crepet:

> "Have you ever seen a white toy? Impossible. There are no white toys. But we create white, sterile schools; emotions terrify us. We fear emotional children because we don't know where they might end up or how they might turn out..." (Botta, Crepet, 2017).

This reflection underscores the importance of reconsidering the role of educational spaces and promoting an approach that values emotions and stimulates students' imagination. We could start with an empty room, a simple white cube, using available resources and accessible tools. Let's take, for example, the old slate chalkboards lying forgotten in school storerooms. We could repurpose them by hanging them along the perimeter of the walls at child height, providing an immediate space for children to freely express their creativity by writing and colouring with coloured chalk.
In the centre of the room, we could lay down yoga mats and colourful cushions, creating soft areas where students can relax and gaze at the ceiling. Here is where artificial intelligence comes into play: projecting dynamic and stimulating images onto the ceiling and upper walls, transforming a static space into a dynamic one. By integrating audio speakers, we could enrich the environment with personalised

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sounds and music, perhaps generated by AI software, creating a sound atmosphere that adapts to the activities conducted in the space.

The result? An immersive and multisensory educational experience, cost-effective, engaging the minds, bodies, and spirits of students. This proposal is not just a flight of fancy; it's a tangible demonstration of how technology, combined with creativity, can transform educational spaces into vibrant and stimulating environments. It's an exploration of the hidden potential within the most common places, an invitation to look beyond appearances and envision the future of education in bold and innovative ways. This vision recalls the concept of "leapfrogging," where those who were behind leap ahead (Ratti, 2014). The social leap made possible by accessible technologies can also be applied to educational spaces. "Poor" or architecturally unappealing buildings can make a significant leap in quality by creatively leveraging available resources and technologies. By using technological tools innovatively, we can transform these structures into educational environments that inspire and engage students. This approach allows for significant results with low costs and reduced time, thereby offering an opportunity to quickly improve students' learning conditions. It's a real chance to empower students and transform school spaces into places of inspiration and meaningful learning by creatively utilizing available resources and technologies.

It's useful to refer to INDIRE's vision of the school of tomorrow in this reflection. The school is no longer seen as a mere container but rather as an engine for innovation, capable of accompanying and supporting a suitable mix of diversified teaching approaches and creating immersive experiences. Students learn by exploring firsthand within the environment. The space - through the arrangement of furniture, the availability of technologies, and the setup - provides opportunities for experimentation and interaction for groups of students, large or small, who learn at different times and in different ways.

Hence, the educational space moves away from a static background dimension to become a "stage" capable of impacting learning processes and the quality of school life" (Dorato, 2021, p.25). Hence, the clear invitation from INDIRE to architects and pedagogists to collaborate in designing educational spaces for the school of the third millennium.

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4.Conclusions

As previously highlighted, at the heart of holistic growth and development is socio-emotional competence. It is widely acknowledged in literature that academic performance depends not only on the students' cognitive potential but also on their interpersonal and intrapersonal skills (Gardner, 1993). The learners' competence to navigate their emotions, build positive relationships, exercise sound judgment, and deal with challenges constructively impacts their academic journey profoundly. The learning environment plays a pivotal role in shaping these competencies, influencing students' behaviours and emotional experiences as they engage with the educational process. Space is emotionally experienced; experience expands or contracts, moves away or approaches, is empty or full depending on emotions and actions (Bobbio, Traverso, 2016).

Architect Giancarlo De Carlo (2013) famously remarked that "architecture is too important to be left solely to architects". Echoing Calvino (Prencipe & Sideri, 2001), the path forward in this case, is not a binary choice between algorithms and emotions. Rather, it's a nuanced blend of both, achieved through interdisciplinary collaboration, sharing of ideas and know-how. While initially appearing unheard of, the partnership between educators and architects has revealed and will continue to reveal a plethora of opportunities. Indeed, the construction and the design of educational spaces resulting from such endeavours has consistently yielded innovative solutions that enhance learning environments, foster student engagement, and promote academic achievement and personal development.

However, our proposal seeks to maximize this resource judiciously, transforming sterile learning environments into dynamic, interactive spaces by leveraging on the opportunities that technology has to offer. Today, technology permeates Italian schools, presenting ample opportunities for integration. The key lies in harnessing ideas that don't rely on exorbitant budgets or specialised expertise. Instead, creativity and ingenuity come at play to provide feasible and sustainable ideas. In other words, by leveraging accessible technologies and embracing collaborative problem-solving, we can turn the constraints of budget and resources into catalysts for innovation to turn 'white boxes' into environments that inspire and empower both educators and students. We aim for walls, ceilings, and corridors that speak, that give voice to feelings and emotions of all those who inhabit within.

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