

AI AND EMOTIONAL WELL-BEING IN TEACHING. CULTIVATING WELL-BEING THROUGH THE USE OF AI-BASED MINDFULNESS FOR ITALIAN STUDENTS

IA E BENESSERE EMOTIVO NELL'INSEGNAMENTO. COLTIVARE IL BENESSERE ATTRAVERSO L'USO DELLA MINDFULNESS BASATA SULL'INTELLIGENZA ARTIFICIALE PER STUDENTI ITALIANI



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ABSTRACT

The affirmation of generative AI requires human communicative skills to develop a shared social intelligence that addresses contemporary challenges, including mental health. Educational institutions in different countries use meditation to counteract the anxiety, stress, boredom and inattention of students aiming at creating positive environments. The research explores the integration of mindfulness among Italian university students through AI App.

L'affermazione dell'IA generativa richiede competenze comunicative umane per sviluppare un'intelligenza sociale condivisa che affronti le sfide della contemporaneità, tra cui rientra la salute mentale. Istituzioni educative in diversi paesi utilizzano la meditazione per contrastare l'ansia, lo stress, la noia e la disattenzione degli studenti mirando alla creazione di ambienti positivi. La ricerca esplora l'integrazione della mindfulness tra gli studenti universitari italiani tramite App di IA.

KEYWORDS

Generative AI, Mindfulness, Educational experience, Emotional well-being.

Intelligenza artificiale generativa, Meditazione, Esperienza educativa, Benessere emotivo.

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Introduction¹

Bringing Mindfulness into the classroom means learning to make a categorical distinction in the educational and formative process between mind-full and mindful: between a *mind full* (Morin, 1999) of informations, habits, things to do; and a *well-made mind*, aware and present to reality, focused.

Mindfulness educational programs for teachers and students are already active in many international institutes, where they receive approval and appreciation.

One of the key principles of Mindfulness that integrates well with education is the focus on being, perceiving, and accepting reality as it is, learning to live in the here and now because the experience of "knowing" is located in that "space of encounter" [...] *[and interaction] is structured, as in the theatrical artistic experience, hic et nunc, in bodily and spatial copresence* (Carlomagno, Minghelli, 2022).

Mindfulness, embracing the construct of Embodied Cognition (Caruana F., Borghi A., 2016), which is based on the interdependence and interconnectedness between mind, body, and emotions, emerges as a practical aspect of being human, involving interconnected mental and cognitive processes, as well as functions related to emotional regulation, bodily perception (breath, posture, action, bodily functions, individual body parts), mind, and mental objects (Mace, 2010).

Mindfulness involves, in this sense, the careful observation of human thoughts, emotions, physical sensations, as well as the environment in which the individual is placed, which is increasingly infused with digital elements, turning it into a useful ally aimed at personalizing the paths of the group of students.

Artificial intelligence, indeed, in the proposed research, has represented a valuable ally in the practice of Mindfulness, making experiences and paths of Mindfulness more accessible and personalized - for the group of students involved - allowing each one to work and obtain greater benefits for their mental health, alleviating feelings of anxiety, stress, boredom, and inattention.

¹ The authors jointly edited the article, the Introduction, the Conclusion and the section 6. Results. In particular, Valeria Vadalà elaborated the research data and drafted the sections 2. Methods, 4. Research Design, 5. Sample, 7. Discussion; Martina Meo edited the section 1. Theoretical Framework; Maria Siriana Fusco conceived the section 1.1 Mindfulness in educational settings abroad; Nadia Carlomagno is the scientific coordinator of the project; she wrote the section 3. Mindfulness and AI.

1. Theoretical Framework

The term *Mindfulness* is the English translation of the word *sati* which, in the Pali language — the liturgical language of Theravāda Buddhism — means *remembering*, in the sense of *bearing in mind*. In the specific case of Mindfulness, one wonders what needs to be kept in mind, the precise and unequivocal answer is: *one must keep in mind to bring attention to the present moment*, to what we experience in a specific moment of action. Mindfulness as a practice of cultivating mental calm and inner well-being or mindful self-awareness, centered on the concept of *embodied mind*.

The mind is, therefore, embodied in our bodies and embedded in our relationships, and awareness meditation techniques, designed to refine the perception of this process, are aimed at recovering this awareness that we could define as bodily-relational here-and-now (Mele, 2010).

Meditative practices aim to bring the mind back into a contextual circular dialectics capable of resizing the tendency to seek universal priorities of an eidetic or mental nature, always theoretical in nature, and the attitude we have to extract and intellectualize our condition as human beings. In this way our mind observes itself in its perpetual becoming in such a way as to transform impermanence and continuous becoming into a new form of freedom, in order to restore mental experience to the pragmatic aspects of living, to the personal and interpersonal context that are *embodied* in the structures of our communities. The mind, according to this approach, becomes the most powerful tool for self-knowledge, to tune the mind and body, thoughts and emotions, actions and words, in a coordinated manner so that, as Buddhists claim, we become *present to ourselves*. Mindfulness-based interventions (MBIs) have been studied in medicine, mental health, neuroscience, business, education, criminal justice system, and even in the military. It has been shown that Mindfulness can alleviate chronic pain (Kabat-Zinn J., 1982; Kabat-Zinn, Lipworth & Burney, 1985), reduce stress, anxiety, and depression (Chiesa & Serretti, 2010; Kuyken et al., 2008). Mindfulness has also been shown to bring changes in brain structure and function, enhancing learning and memory processes (Hölzel et al., 2011). Improvements in other executive functions (EF) such as attention, cognitive functioning, and working memory - short-term memory have also been reported (Chambers et al., 2008; Zeidan et al., 2010). The ability to use Mindfulness to regulate emotions has also been demonstrated (Chambers et al., 2008).

Mindfulness practices were first applied in Western medicine in the 1980s with patients mainly affected by chronic conditions not treatable with traditional medicine, which simulated stress, disability, and pain management.

Among the most well-known are:

- *Mindfulness-Based Stress Reduction*, a program for reducing psycho-physical suffering (stress), developed in the field of behavioral medicine by Professor Jon Kabat-Zinn and his collaborators at the Massachusetts Institute of Technology. In addition to being a pioneering experience recognized by clinical and psychosocial applications of Mindfulness, it is the most studied and validated program in the research literature and is offered in more than 400 hospitals in the United States and within the context of integrative medicine in Europe;
- *Mindfulness-Based Cognitive Therapy* by Segal, Williams, and Teasdale, which in 2012 represented an important treatment for preventing relapses in depression, especially for cases of chronic depression (3 or more episodes over the course of life), representing an evolution of the previous model that tends to focus more on the process of thought, rather than the content of thought itself, not with the aim of transforming them, but with the goal of engaging with them, recognizing them for what they are, and letting them go;
- *Acceptance and Commitment Therapy* by Hayes from 1999 is a therapy that aims to increase the patient's psychological flexibility, helping them to be more aware of their own thoughts, emotions, and automatic behaviors. This practice is also called *trans-diagnostic psychotherapy* as it can be applied to psychological disorders that are very different from each other.

In comparison to the field of medicine, the potential of Mindfulness practice as an educational tool has only recently developed, particularly in the United States, and has rapidly spread worldwide. Despite the relative scarcity of studies on the effects of Mindfulness on children and adolescents compared to adults, Mindfulness is increasingly being incorporated into educational contexts. This is understandable given the framework of preliminary evidence: Mindfulness interventions in clinical and educational settings have been shown to reduce stress and alleviate feelings of depression (Biegel et al., 2009; Kuyken et al., 2013), improve executive functions such as metacognition (Vickery & Dorjee, 2016), manage emotional triggers (Mendelson et al., 2010), decrease anxiety (Huppert & Johnson, 2010), and

enhance social competence. Today, prestigious universities and high schools are promoting an educational philosophy that includes experiential learning through meditation practices, recognizing the importance of acquiring self-awareness and awareness of others. This philosophy conceives education as the gradual and integrated development of the individual within society, considering cognitive and emotional dimensions as crucial aspects for overall growth and the promotion of individual mental health (Peter Felsman P., Seifert, C.M., Sinco, B., Himle, J.H., 2023). In the educational context, various global initiatives are beginning to focus on the importance of individuals' perception and awareness of themselves. In this context, training the awareness of the embodied dimension of educational action cannot simply enrich scientific knowledge or use neurocognitive interpretive keys; it is essential to create spaces for performative experimentation, where it is possible to explore expressive, pre-expressive (Barba, 1993), and interpretive tools. This approach aims to elevate the level of self-awareness and body awareness through performative, formative, and transformative actions (Carlomagno et al., 2021). In educational settings, practices that work on self-awareness are increasingly adopted within school contexts. The first numerous interventions, in the university context, sought to promote and increase students' well-being first and foremost (Carlomagno N., Battaglia M.V., 2023). A study conducted in 2014 (Van der Riet et al., 2014) also examined the impact of a stress management program based on Mindfulness practice, designed to increase resilience and stress management skills in first-year Nursing and Midwifery students at an Australian university. At the end of the experience, it emerged that the intervention had a positive impact on concentration, clarity of thought, and the reduction of negative ideas. It is interesting to note that in a group of university students, a Mindfulness intervention increased GRE scores (a standardized test required for admission to most universities in the United States and Canada) and working memory (Mrazek et al., 2013). The literature indicates that Mindfulness interventions and programs can be effective in universal school environments, where an entire school or class receives a Mindfulness intervention, as well as with targeted groups of students, at-risk youth, and clinical populations (youth with behavioral and/or mental health problems), as well as students with low basic executive functioning. Indeed, these studies demonstrate that these vulnerable student populations, in particular, can derive greater benefits from Mindfulness interventions compared to their "healthy" peers (Huppert & Johnson, 2010).

1.1 Mindfulness in educational settings abroad

Mindfulness is emerging in various geographical regions not just as a passing trend, but as an essential element of education, profoundly altering the way students engage in learning, personal development and social interaction. In the following section, we aim to explore a selection of prominent initiatives from various countries, each offering valuable insights into the profound impact of Mindfulness within educational contexts.

In Australia, *Smiling Mind School* leads the way with its evidence-based mindfulness curriculum, aimed at enabling students to cultivate self-awareness, emotional regulation, and social awareness. With significant government support, Smiling Mind's program is poised to influence hundreds of schools nationwide, bridging the gap between theory and practice to create meaningful change in the lives of Australian students.

In the United States, Mindful Schools has emerged as a pioneering force, sparking a surge of interest among educators even before the onset of the pandemic. Between 2013 and 2016, the organization experienced exponential growth, tripling its reach in schools and among teachers nationwide (U.S. News & World Report, 2022). In the past year alone, Mindful Schools has supported over 5000 educators in 500 schools across the country, in addition to the 70,000 individuals trained by Mindful Schools since 2013. However, recent financial challenges have led to the closure of the NGO, highlighting the precariousness of sustaining such initiatives. Nonetheless, the impact of Mindful Schools on advancing Mindfulness education in the United States cannot be underestimated, leaving behind a rich legacy of resources and knowledge for educators nationwide. Similarly, in the United Kingdom, Mindfulness practices are being experimented with. Specifically, the *Link Programme* has represented a holistic approach to promoting emotional resilience and well-being in schools nationwide, aiming to provide educators with the training and resources needed to recognize and address students' mental health needs. Through mindfulness practices integrated into the curriculum, students have been equipped with valuable tools to navigate the pressures of academic life with greater ease and awareness. The *Link Programme*, under the Department for Education's contract with the Anna Freud Centre for Children and Families, expired on March 31, 2022, leading to its closure. Since its inception in 2015, over 3,000 schools and universities across the country have adopted it, even during the Covid-19 pandemic. Currently, the UK Department for Education continues to work with local leaders to explore alternative ways to facilitate effective partnerships, remaining committed to providing mental health training to all state schools and universities by 2025 and rolling out mental health support teams to 35% of the country by 2023.

Both goals build on the successes of the *Link Programme* and enable school leaders to better understand and work with the local system.

In Singapore, through innovative programs and activities such as yoga and mindful coloring, Mindfulness has given rise to schools like *Tanglin Trust School*, where emotional regulation and student well-being are cultivated from a young age.

In Bhutan, Mindfulness education takes on a deeply rooted meaning, aligning with the pursuit of *Gross National Happiness*. Beyond the confines of traditional classroom education, Bhutan's approach to Mindfulness permeates every aspect of education, instilling in students a profound sense of interconnectedness, compassion, and ethical awareness. Guided by Buddhist principles and values, Bhutanese educators foster critical thinking and ancient wisdom, equipping students with the tools to face life's challenges with grace and resilience (Tshomo P., 2016).

Lastly, in India, the Delhi government has introduced the groundbreaking *Happiness Class* as the centerpiece of the school curriculum. This daily 45-minute session immerses students in a holistic journey of self-discovery, incorporating practices such as yoga and meditation to nurture their emotional well-being and resilience. With a reach of 800 thousand students per day (The New Indian Express, 2020), the Happiness Class represents a bold effort to cultivate sustainable happiness and inner peace among India's youth. Through these diverse initiatives, common themes emerge individualized in the commitment to holistic development, emphasis on emotional well-being, and dedication to creating inclusive and equitable learning environments for all students.

2. Methods

In relation to the highlighted points, the proposed research represents a pilot study aimed at investigating the effectiveness of Mindfulness in addressing the highly prevalent states of stress, anxiety, boredom, and inattention among Italian students using an Arts Based Research (ABR) approach, a methodology that integrates artistic practices with empirical research (Pellery, 2018) to provide a deeper insight into the impact of Mindfulness on students' mental health.

This multidimensional approach allows capturing a broader range of students' experiences and perceptions, contributing to the development of personalized and more effective practices in managing stress, anxiety, and the phenomenon of inattention in the Italian student population. The integration of artistic practices into the Mindfulness experience within the Art-Based Research (ABR) approach offers an important opportunity to gain a deeper understanding of students'

personal experiences. Activities involving the body, such as Mindfulness practice, can reveal emotional nuances and internal processes that may remain hidden during traditional teaching and learning processes. The practice of Mindfulness enables capturing more subtle and meaningful aspects of students' well-being with the ultimate goal of enriching their Mindfulness experience.

3. Mindfulness e AI

The practice of Mindfulness, through the use of AI-based applications, leads to the realization of guided meditation sessions that include vocal instructions to help individuals focus on the present moment, their breath, and awareness of their body and thoughts. Some applications also use artificial intelligence algorithms to tailor Mindfulness sessions to individuals' needs, taking into account their level of experience, preferences, and current emotional state to offer a personalized experience. Mindfulness applications also allow monitoring of users' usage and progress over time, providing feedback and suggestions based on collected data to improve their meditation practice.

The proposed exploratory research specifically investigated the English meditation application "Headspace," which, using AI, through precise prompts provided by the students, was able to offer guided educational meditation activities, pathways, and specific breathing exercises. It succeeded in customizing the activity for the group of university students involved by providing targeted meditations to reduce stress and improve concentration.

The most common responses from students, obtained from the entrance questionnaire, represented the prompts that were manually inserted on the initial screen of the Headspace App, which provided a personalized pathway characterized by three moments of meditation in the English language. To allow easy understanding of the Mindfulness experience for all students, the three meditation moments were translated and recorded in Italian language using a voice recorder.

The Mindfulness practice generated by the "Headspace" App via AI includes:

- A first moment, called "Mindful Breathing", dedicated to breathing practice, where students are asked to inhale for four seconds, hold their breath for seven seconds, and exhale for eight seconds through a five-minute video. The meditation practice involves repeating the action for the entire duration of the experience.

- A second moment, called "Remember the Blue Sky", lasting one and a half minutes, where students are provided with a metaphor of the mind through a recorded voice (translated into Italian language for our pilot research), describing it as a blank canvas on which thoughts, feelings, and experiences appear. The second meditation moment aims to remind students that, even in difficult times, it is possible to see the light and that often what they desire is already within their reach.
- A third moment, called "Daily Gratitude", lasting three minutes and twenty seconds, where students are asked to reflect on the importance of having some mindfulness tools to maintain a state of positivity and well-being, such as "shifting to an attitude of gratitude." The third meditation moment invites students to slowly shift into a space of gratitude thinking about three things they are grateful for (person, place, object) and encourages students to start a gratitude journal to incorporate this practice into their daily lives.

This research is characterized by four phases: during Phase 1, students experienced Mindfulness in an upright position; in Phase 2, students practiced meditation while sitting; in Phase 3, students practiced in a supine position using yoga mats; and in Phase 4, students were free to choose the position they found most comfortable. The choice to diversify the way students experience Mindfulness was dictated by the desire to allow students to experience different ways to achieve a state of greater well-being, emphasizing how achieving such state is typically a subjective matter.

4. Research Design

The aim of the proposed pilot study is to investigate, with the assistance of digital tools, the technique of Mindfulness as a tool to provide Italian university students with multiple benefits that can significantly enhance their educational experience and overall well-being. Specifically, the study aims to foster the creation of positive educational environments for student growth, aiming to reduce stress, anxiety, boredom, and inattention, in order to promote optimal physical and emotional well-being. The research took place over a period of four weeks, consisting of a total of four sessions, each lasting four hours, for a total of sixteen hours overall. Before starting a university laboratory-style class, students were asked to engage in Mindfulness practice with the aim of promoting a mind-body connection, as a sophisticated and effective form of *embodied cognition* (Varela, Thompson, &

Rosch, 1991). In Phase 1 and Phase 4 of the research, an introductory questionnaire was administered before the meditation experience; and a concluding interview was conducted with the group of students involved, after the Mindfulness experience ended. The introductory questionnaire included questions from the opening screen of the Mindfulness app "Headspace," where users are asked to respond to some questions to personalize their experience. In the concluding interview, students were prompted to reflect on their personal experiences with Mindfulness and to observe any shifts in their mental well-being within their day-to-day lives. The introductory questionnaire and concluding interview were administered on the first day students experienced Mindfulness practice for the first time (Phase 1) and on the last day they engaged in the Mindfulness experience for the final time (Phase 4). The research aims to compare the results, i.e., what students felt and experienced before the Mindfulness experience, with what they experienced and felt at the end of the program. This is intended to demonstrate how such an experience can generate a state of physical and emotional well-being in students, as well as promote the creation of more welcoming and positive educational settings. This, in turn, creates a specific ecosystem that allows the individual to detach from the place and time they are in, to visualize themselves in a defined perceptual space, termed *Umwelt* (Uexkull, 2014). The practice of Mindfulness using AI-based applications should thus represent a daily routine in educational contexts, with the aim of improving the teaching and learning processes of Italian students, as is already happening in the United States and in other countries in the world.

5. Sample

The exploratory research, conducted in the form of a pilot study, analyzed data collected from a sample of 46 university students who participated in the educational workshop *Playing you Learn: Techniques for the Theatrical animation and communication* within the bachelor's degree program in Educational Sciences (L-19) at the Suor Orsola Benincasa University of Naples, during the academic year 2023-2024. The sample consisted of 44 female students and 2 male students, with an average age of 21 years. The majority of participants originated from the Campania region.

6. Results

For the proposed research, both quantitative and qualitative results were analyzed. Quantitative data were obtained by analyzing students' responses, focusing on the words they used to describe their moods at the beginning and end of the first phase of the experience. These were then compared with the responses obtained at the beginning and end of the fourth phase of the experience (see Table 1).

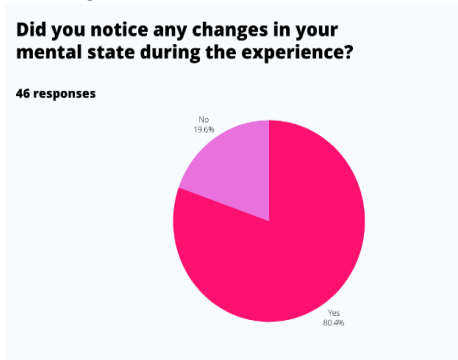
Table 1. Moods before and after Mindfulness experience

<u>PHASE 1</u>	Before Mindfulness experience	After Mindfulness experience	<u>PHASE 4</u>	Before Mindfulness experience	After Mindfulness experience
😊 happy	5	4	😊 happy	5	1
😄 excited	0	0	😄 excited	1	0
😌 grateful	0	1	😌 grateful	1	4
😌 relaxed	5	32	😌 relaxed	2	31
😊 pleased	2	0	😊 pleased	3	2
😓 tired	15	6	😓 tired	11	3
😓 self-conscious	1	0	😓 self-conscious	0	0
😞 bored	7	0	😞 bored	5	0
😬 anxious	1	0	😬 anxious	5	0
😡 angry	0	0	😡 angry	0	0
😡 stressed	7	2	😡 stressed	11	1
😞 sad	1	0	😞 sad	1	2
<input checked="" type="checkbox"/> inattentive	1	1	<input checked="" type="checkbox"/> inattentive	1	0
🧘 attentive	2	0	🧘 attentive	0	2

The introductory questionnaire and concluding interview administered in Phase 1 revealed that more than 70% of the surveyed students reported experiencing a change in their mental (Fig. 1 - Phase 1) and emotional (Fig. 2 - Phase 1) states as a result of participating in the Mindfulness experience (80.4% experienced the former, while 60.9% experienced the latter). The activation of both body and emotions was indicated as a key element in connecting with their moods.

Additionally, it was observed that the level of stress and feelings of boredom among students decreased, while the sensation of relaxation increased significantly, rising from 10.6% to 69.6% (Fig. 3 - Phase 1 and Fig. 4 - Phase 1). Furthermore the introductory questionnaire and concluding interview administered in Phase 4 showed that 87% of students experienced a change in their mental state (Fig. 1 - Phase 4), and 67.4% noticed a change in their emotional state during the experience (Fig. 2 - Phase 4). The data also demonstrated that through the Mindfulness experience, the levels of stress, boredom, fatigue, and inattention among students decreased, while feelings of happiness, gratitude, attention, and particularly relaxation increased significantly, rising from 4.3% to 67.4% (Fig. 3 - Phase 4 and Fig. 4 - Phase 4). Moreover, the results showed that participants experienced a predominance of positive emotions after the Mindfulness experience in both Phase 1 and Phase 4 (Fig. 5). Qualitative data, on the other hand, were obtained by analyzing and comparing the words chosen by students to express their emotions before beginning the Mindfulness experience (Phase 1) and after completing it (Phase 4). At the end of all sessions (Phase 4), characterized by the meditation experience, students showed a significant increase in positive emotions (serenity, tranquility, happiness, freedom) compared to the first day of experiencing Mindfulness (Phase 1), along with a decrease in negative emotions. Additionally, there was a slight increase in the number of individuals declaring themselves emotionally neutral (Fig. 6).

Fig. 1 (Phase 1)



(Phase 4)

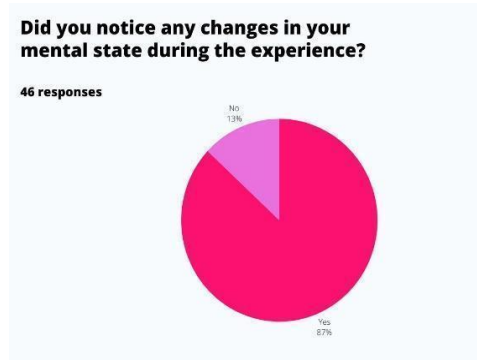
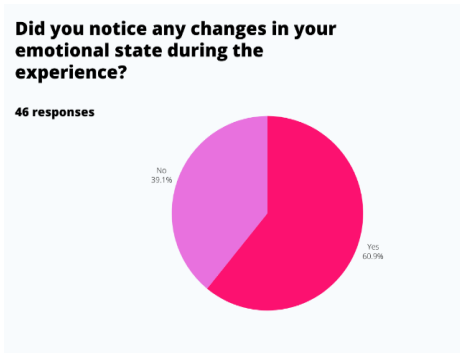


Fig. 2 (Phase 1)



(Phase 4)

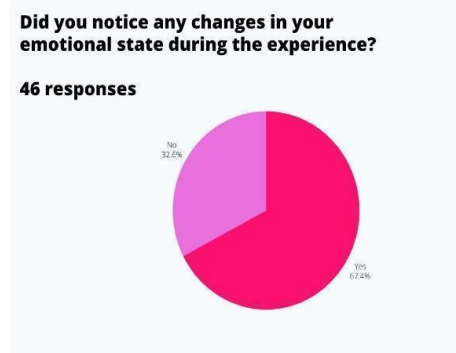
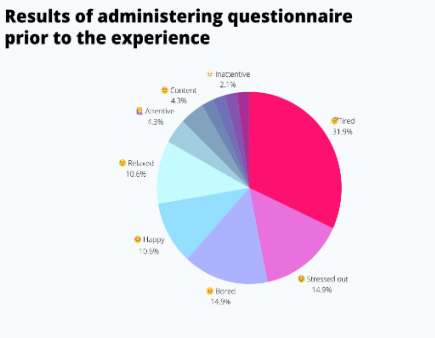


Fig.3 (Phase 1)



(Phase 4)

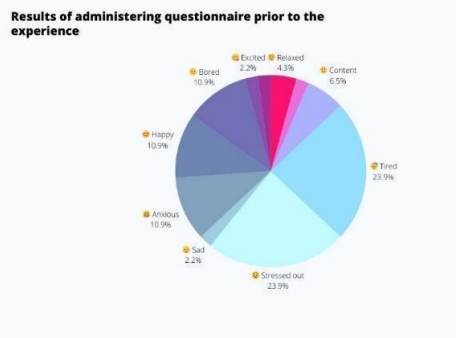
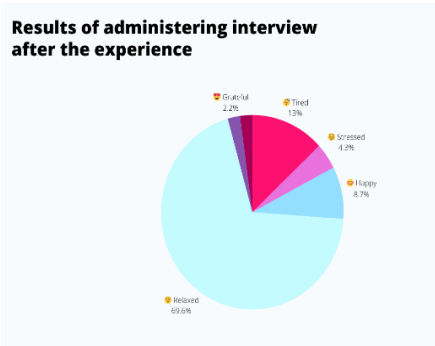


Fig.4 (Phase 1)



(Phase 4)

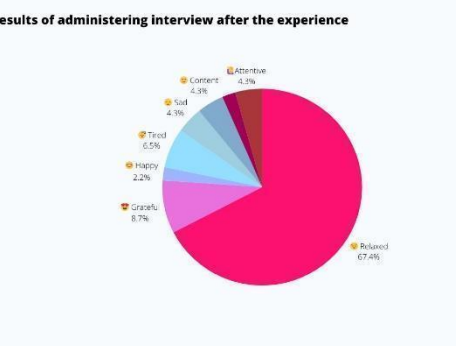


Fig. 5

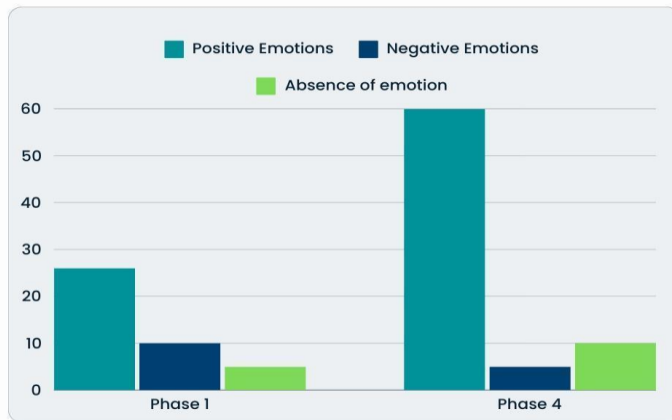
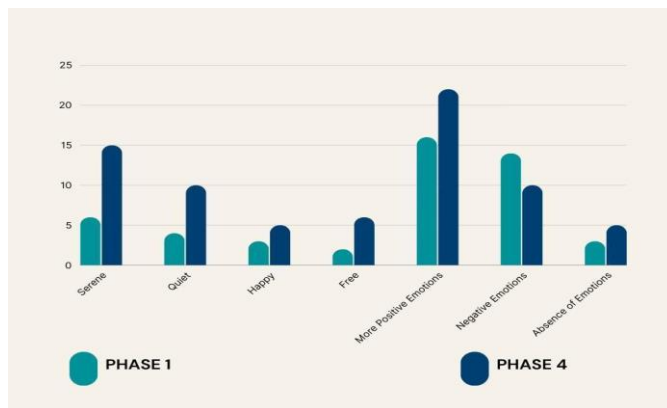


Fig. 6



7. Discussion

The practice of meditation in educational contexts represents a model from which to address mental health well-being, seen as one of the growing challenges in the Western world. Introducing meditation practices within educational institutions to counteract students' anxiety, stress, boredom, and inattention in order to promote generative settings of well-being is the goal of the proposed research. Meditative practices through the use of technology, particularly through specific applications of generative artificial intelligence, allow students and teachers to re-engage with

their bodies and emotions, connect with them, create meaningful relationships, and generate empathic processes. The data emerging from the pilot research deepen the understanding of the *embodied mind* concept, wherein the mind is embodied in individuals' bodies and relationships, drawing attention to the subject's present moment awareness, being mindful of the body-relational here and now (Mele, 2010), and emphasizing the positive correlation between bodily engagement and the creation of a relational and empathic space. The meditation techniques and practices used, indeed, enable students to perceive themselves, others and the environment around them consciously and responsibly, thus generating more meaningful teaching-learning processes (Ausubel, 1995). Studies on Embodied Cognition (Varela F.J., Thompson E., Rosch E., 2016) and performative teaching (Carlomagno, N., Cordella, F.M., Minghelli, V., Rivoltella, P.C., 2021) underscore the importance of mind-body connection and movement in educational settings, as they facilitate both cognitive and affective teaching-learning processes. The research results demonstrate, on the one hand, that mindfulness practice in education is essential for achieving students' psycho-physical and emotional well-being through technology and, on the other hand, that generative artificial intelligence applications can lead to the creation of well-being-promoting settings, as well as more welcoming and inclusive spaces. In the presented laboratory teaching experience, mindfulness practice succeeded in promoting significant experiences capable of influencing students' perception of empathic processes, involving interconnected mental and cognitive processes, emotional regulation, bodily sensorimotor experiences (breath, posture, action, bodily functions, individual body parts), sensations, mind, and mental objects (Mace, 2010). Considering these experiences and the aid of digital technology, it becomes evident that the integration of mindfulness in education is not merely a passing trend but can mark the beginning of a change in how teaching-learning processes and personal development are approached. The presented experience aims to consider mindfulness as a practice that restores centrality to the performative role of the body to be used within educational contexts (Carlomagno N., Battaglia M.V., 2023) to experiment with positive social change, with the aim of reducing situations of stress, anxiety, boredom, and inattention that increasingly characterize the daily routine of Italian students; and to generate positive, more welcoming, inclusive, and classroom-sized learning spaces.

Conclusions

Considering the positive results emerging from the qualitative and quantitative data analysis of this exploratory research, we look towards the future with the hope of investigating further aspects, both qualitative and quantitative, with a larger sample size. These endeavors aim to strengthen the practice of Mindfulness combined with AI to promote well-being in Italian schools. We envision an application that not only guides students through Mindfulness exercises but also utilizes intelligent algorithms to dynamically adapt content based on their emotional responses and progress over time. Additionally, AI could provide support to teachers by offering tools to monitor the emotional well-being of the class as a whole and identify students who may benefit most from specific interventions. However, to fully realize this potential, a collaborative effort among Mindfulness experts, software developers, and educators will be necessary to ensure that such applications are ethically designed, respectful of privacy, and culturally sensitive. Only then can we fully harness the transformative power of technology to promote the well-being of students in Italian schools.

References

Ausubel D.P. (1995). *Educazione e processi cognitive, Guida psicologica per gli insegnanti*. Milano: Franco Angeli.

Baird L.L. (2022). *Mindfulness in K-12 Schools*. U.S. News & World Report.

Barba E. (1993). *La canoa di carta, Trattato di antropologia teatrale*. Mulino: Bologna.

Bilotti U., Campitiello L., Domenico Todino M., Sibilio M. (2023). *Emulation and understanding the emotion according to generative artificial intelligence - Case study of emotional component extracted from visual artworks*, Journal of Inclusive Methodology and Technology in Learning and Teaching.

Biegel G. et al. (2009). *Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial*. Journal of Consulting and Clinical Psychology.

Botta E., Lucisano P. (2023). *Me and the School: Student Perception of Anxiety and Well-Being in the School Context*. Journal of Educational, Cultural and Psychological Studies.

Carlomagno, N., Battaglia, M.V. (2023). *Didactics, theater and well-being in the distance learning experiences*. GSDJournal 7(2). EUR, Roma.

Carlomagno N., Minghelli V. (2022). *Interpersonal Distance in CREAP+T Method in Distance Learning*, In AA.VV., Higher Education Learning Methodologies and Technologies Online. Cham: Springer.

Carlomagno N., Cordella F.M, Minghelli V., Rivoltella P.C. (2021). *Performative Didactics in a Technological Environment*. «REM», Vol. 13, N. 1, ISSN: 2037-0830, doi: 10.2478/rem-2021-0003, p. 7-16.

Caruana F., Borghi A. (2016). *Il Cervello in Azione*. Bologna: Il Mulino.

Chambers R. et al. (2008). *The Impact of Intensive Mindfulness Training on Attentional Control, Cognitive Style, and Affect*. Cogn Ther Res 32.

Chiesa A., Serretti A. (2010). *A systematic review of neurobiological and clinical features of mindfulness meditations*. Psychological Medicine.

Esposito E. (2022). *Comunicazione Artificiale. Come gli algoritmi producono intelligenza sociale*, BUP.

- Finestronea F., Limone P., Peconioc G. (2023). *Nuovi scenari di progettazione educativa: esperienze di didattica immersiva*. Open Journal of IUL University.
- Floridi L., Cowls J. (2019). *A Unified Framework of Five Principles for AI in Society*. Harvard Data Science Review.
- Gray A. (2018). *These Indian schools are giving lessons in happiness*. World Economic Forum.
- Hayes SC, Strosahl KD e Wilson KG (1999). *Acceptance and commitment therapy: an experimental approach to behavior change*. Guilford Press, New York.
- Hayes SC, Wilson KG (1994). *Acceptance and commitment therapy: Altering the verbal support for experiential avoidance*. The Behavior Analyst, 17 (2), 289-303.
- Hess Lauren B. (2018). *Mindfulness in K-12 education: A case study approach exploring the implementation and sustainability of school mindfulness programs*. Boston University.
- Hölzel B.K. et al. (2011). *Mindfulness practice leads to increases in regional brain gray matter density*. Psychiatry Research: Neuroimaging, Volume 191, Issue 1.
- Hülshager U.R, Alberts H.J,, Feinholdt A., Lang J.W. (2013). *Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction*. Journal of Applied Psychology, 98, 310–325.
- Huppert F. A., D. M. Johnson D. M. (2010). *A controlled trial of mindfulness training in schools: The importance of practice for an impact on well-being*. The Journal of Positive Psychology.
- Kabat-Zinn J. (1990). *Full catastrophe living: using the wisdom of your body and mind to face stress, pain and illness*. Dell Publishing, New York.
- Kabat-Zinn J. (1982). *An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: theoretical considerations and preliminary results*. General Hospital Psychiatry, 4(1), 33–47.
- Kabat-Zinn J. (1985). Lipworth L., Burney R., *The clinical use of mindfulness meditation for the self-regulation of chronic pain*. J Behav Med.
- Kuyken W. et al. (2008). *Mindfulness-based cognitive therapy to prevent relapse in recurrent depression*. Journal of Consulting and Clinical Psychology.
- Kuyken W. et al. (2018). *Effectiveness of the Mindfulness in Schools Programme: non-randomised controlled feasibility study*. Cambridge University Press.

- Kuyken W. et al. (2013). *Effectiveness of the Mindfulness in Schools Programme: non-randomised controlled feasibility study*. British Journal of Psychiatry.
- Mace C. (2010). *Mindfulness e salute mentale. Terapia, teoria e scienza*. Astrolabio Ubaldini.
- Mele S. (2010). *La relazione mente-corpo. Embodiment, mindfulness, neuro fenomenologia*. Libreriauniversitaria.it., 66.
- Mendelson T. et al. (2010). *Feasibility and Preliminary Outcomes of a School-Based Mindfulness Intervention for Urban Youth*. J Abnorm Child Psychol 38.
- Menin M. (2019). *Il fascino dell'emozione*. Bologna: Il Mulino.
- Morin E. (1999). *La testa ben fatta. Riforma dell'insegnamento e riforma del pensiero*. Milano: Raffaello Cortina Editore.
- Mrazek M. D. et al. (2013). *Mindfulness Training Improves Working Memory Capacity and GRE Performance While Reducing Mind Wandering*. Psychological Science.
- Panciroli C., Rivoltella P.C. (2023). *Pedagogia algoritmica. Per una riflessione educativa sull'Intelligenza Artificiale*. Brescia: Scholè.
- Pellery P. (2018). *Handbook of arts-based research, The Guilfor Press*. Paperback edition 2019.
- Peter Felsman P., Seifert, C.M., Sinco, B., Himle, J.H. (2023). *Reducing social anxiety and intolerance of uncertainty in adolescents with improvisational theater*. The Arts in Psychotherapy 82.
- Segal Z., Williams M., Teasdale J. (2012). *Mindfulness-Based Cognitive Therapy for Depression*. Guilford Publications.
- Shapiro S.L., Oman D., Thoresen C.E., Plante T.G., Flinders T. (2008). *Cultivating Mindfulness: Effects on Well-Being*. Journal of Clinical Psychology, Vol. 64(7), 840-862.
- Manish S. (2020). *Happiness classes' to be conducted at homes of Delhi govt school students*. The New Indian Express.
- Tomas M., Riccato O., Ongaro G., Mauri A. (2018). *Benessere percepito e pratiche mindfulness in pazienti ospedalieri*. Psicologia della salute: quadrimestrale di psicologia e scienze della salute. Franco Angeli.

Tshomo P. (2016). *Conditions of Happiness: Bhutan's Educating for Gross National Happiness Initiative and the Capability Approach*. Springer Science+Business Media Singapore.

Van der Riet P., Rossiter R., Kirby D., Dluzewska T., Harmon C. (2014). *Piloting a stress management and mindfulness program for undergraduate nursing students: Student feedback and lessons learned*. *Nurse Education Today*, 35 (2015) 44-49.

Varela F.J., Thompson E., Rosch E. (2016). *La mente incarnata. Scienza cognitiva ed esperienza umana*. Edizione rivista. The MIT Press, Cambridge (Mass).

Vazquez-Cano, E. (2021). *Artificial intelligence and education: A pedagogical challenge for the 21st century*. *Educational Process International Journal*.

Vickery E., Dorjee D. (2016). *Mindfulness Training in Primary Schools Decreases Negative Affect and Increases Meta-Cognition in Children*. *Frontiers in Psychology*, Volume 6.

Weinstein N., Brown K.W., Ryan R.M. (2009). *A multi-method examination of the effects of mindfulness on stress attribution, coping, and emotional well-being*. *Journal of Research in Personality*, 43, 374–385.

Zeidan F. et al. (2010). *Mindfulness meditation improves cognition: Evidence of brief mental training*. *Consciousness and Cognition*, Volume 19, Issue 2.