

Abstracts

First International Conference on Embodied Education

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Advancing STEM Education through Embodied Cognition Perspectives

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The longstanding tradition in education, and particularly in STEM fields, to prioritize cognitive achievements while neglecting the embodiment of learners has led to a dichotomized view of the mind and body in educational practices (Almqvist & Quennerstedt, 2015; Alsop, 2011). This dichotomy is increasingly questioned by emerging insights from the interdisciplinary field of embodied cognition, which suggest that learning processes are deeply rooted in bodily experiences (Shapiro, 2014; Wilson & Foglia, 2017).

In this talk, I argue that the duality of STEM subjects – their reach for the abstract while remaining anchored in the concrete - positions STEM education as a fertile ground for exploring and integrating embodied cognition perspectives (Kersting et al., 2023). Indeed, the alignment of embodied perspectives with educational practices offers transformative potential for making STEM education more accessible to a broader range of students. At the same time, STEM education research is ideally suited to test theoretical claims about the embodied underpinnings of cognition empirically.

Building on the typology of the four senses of embodiment (Kersting et al., 2021), I first present an overview of how the body bears on science learning on multiple levels. I then offer insight into the application of this typology within our STEM teacher education programs at the Department of Science Education at the University of Copenhagen. In conjunction with this, our newly founded Science Education Network for Supporting Embodied Sense-Making (SENSES) exemplifies a collaborative venture that intertwines research and practice. SENSES is dedicated to innovating and implementing embodied teaching strategies that engage and resonate with upper-secondary school students.

In conclusion, by advocating for an embodied approach in STEM education and cultivating reflective practice around the role of the body in learning, I seek to underline the value of embodied cognition perspectives in bridging the gap between learners and scientific knowledge.

Affectionate and Affecting Identities: Embodying New Cognition through Plurality and Place-Making

By Berit Bæksten, Alice Bell, Antonella Cuppari and Sayeh Nejatiankazemi

Performance art has long been recognised as a powerful medium for challenging established orders and disrupting societal norms (Schechner, 2013, Rancière, 2009). Bodies, when activated within formal learning contexts, emancipate viewers and performers alike. Through providing multiplicities of gaze, gesture and nuance, bodies confront normative contexts and activate

relational dialogues of greater complexity and depth than words alone. As four interdisciplinary, intergenerational and intercultural scholars from Britain, Norway, Italy and Iran, our bodies first met at an educational conference on 'adult education and life his[her]stories' in Trondheim 2023. Here we first witnessed the unexpected performance *Surplus* by Kazemi. This catalysed the generation of four further 'inter-affective' (Heijer et al. : 2022), performances: *Intertwine*, Cuppari and Kazemi, *In Her Shoes* by Bell, *Return* by Bell and Kazemi and *Booted* by Bareksten. These embodied expressions transcended nationalities and through a succession of relational interplays, embraced implicit gender, cultural and institutional similarities. All women, regardless of cultural background, shared similar affect when operating within, between, outside and at the edges of institutional, cultural and educational control. Through these enactments we started to reimagine, reinterpret, reshape ways of being. As acts of embodied cognition, we made visible, sharpened, let go, passed on and shifted our concerns into action.

"The body and the mind are connected through imagination. Images are the vehicle through which our mental processes reach deep into our cellular structures and communicate. They are the interface between what is deep within the cells of our bodies and what is deep within our psyche. Imagery, which is thought without words, can actually alter the intelligence of the cell'.

(Achterberg, J in Horrigan, B: 1997:140)

For Embodied Education, we propose a workshop whereby we first screen short excerpts from these performances and then invite participatory actions activated from some of the key imagery. Everyday objects such as our shoes, gloves, feet, hands will become employed. In all the performances above, items such as gloves and boots were used as both transitional objects (Winnicott, 1953), carriage mechanisms (Ettinger in Pollock 2020), and learning tools.

A learning that "does", between sounds and visions

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Maria Laura Belisario
Florence University

The contribution place itself in line with an epistemological matrix that investigates complexity and with a phenomenological paradigm of reference originated by Merleau-Ponty and taken up by Varela (together with Thompson and Rosch, 1991). We will focus on the heuristic potential of embodied knowledge, adhering to Merleau Ponty's principle that knowledge cannot be understood without investigating its corporeality as lived experience.

Starting from a knowledge of gestures, of *hands that do* (Mancino, 2020) through which the subject becomes an active protagonist (Cambi, 2003), giving meaning to experience (Dewey, 2014),

the individual gets in touch with himself, the world and the other: it is through the body that the individual experiences learning, and represents it.

Artistic experience allows the subject to become the protagonist of learning, constructing new gazes through which to read the world (Mancino, 2014).

We will refer, in particular, to two types of artistic languages: that of sound and film.

The first experience consists in the active involvement of students in experimenting with sounds and instruments used by Primitive Man and interweaves the art of music with the art of theater, as participants are invited to take on the guise of Primitive Men through the mimicry ability, which

concerns an action that is not limited to simple imitation, but allows the experience of hypothesis (Scaramuzzo, 2013).

The second, which has the ultimate goal of making cinema a curricular subject in schools, involves a pathway from the study of film art to the creation of an actual film product by the children.

Contents and methods of each proposal will be explored, highlighting the role of body, mind and art in active and interdisciplinary learning, through methodologies of reflective pedagogy, documentation and rigorous narratives of the processes of knowledge construction from participation in artistic making (through film and sound).

Keywords: art, body, generativity, phenomenology, participation

A novel transformative approach to Performing Arts Education inspired by P.P. Pasolini's "Manifesto Theatre": An embodied approach to permanent education

by Irene Gianceselli, Andrea Bosco and Luigi Pastore
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This proposal deals with the “Manifesto per un nuovo teatro” (Pasolini 1968) considered for the first time as an innovation for pedagogy and education in both Italy and Europe (Gianceselli 2022; 2023). Pasolini suggests actors to become “transparent on thought”: the “cultural rite” is a permanent workshop for a linguistic, ethical, and political re-education for society. So, the “embodied word”, if properly analysed and actively discussed during and after the action, is the toll for the stimulation of all the different intelligences. Pasolini seems to anticipate in his *Manifesto* the *Transformative Learning Theory* of Mezirow (1975; 2000), the *Trans-Ontology* of Nancy (1996; 2019), and the enactive approach. The educational *praxis* that I suggest through performing arts responds to Mezirow’s aims to transform personal and social bias, beliefs, ideologies, and my research has produced particularly relevant results: about 277 students have obtained a higher level of concentration and a rather relevant activation of their cognitive and metacognitive processes undergoing the training derived from the Pasolini’s *Manifesto Theatre*. Students have also become aware of the fact that their bodies express a “singular plural” and that they are related to each other. So, this *praxis* helps to understand how we daily perform a “coming into contact” and a “touching” that is a political act changing our lives and our reaction to otherness. This research, based on a *Mixed-Method* design, allow to build an educational paradigm that, linguistically analysing the discourses of the performing arts, engages on several themes: from the cogent ones that invest the pedagogy and the psychology of learning to the political, ethical and civic ones, up to those of transfeminism and intersectionality for a society that can make transformation not only its utopian vocation, but its simplex reality (Berthoz 2009) through a conscious embodied cognition.

Anti-bodies as antibodies for a Physical Education (PE) in crisis

Sarkkunan Viswanathan

This session will discuss value propositions (antibodies) for PE discovered through an embodied studying of data collected via semi-structured interviews with educators (n=7). In an unconventional and layered way, I will argue that pedagogical contexts against or opposed to the conventional normative treatment of the body (anti-bodies) will sustain the academic legitimacy of PE in the curriculum and resolve the precariatization of physical educators (Cruickshank et al,

2021; Kirk, 2009, 2019). The embodied studying method brings together Sheets-Johnstone's (2011, 2018) rendered understanding of kinaesthesia with Lewis's (2013, 2014) notion of studying through a postqualitative inquiry (St. Pierre, 2018, 2019). Through the method, I tinkered with tasks such as hand-tracing with the non-dominant hand and thought experiments such as uploading concepts and skills directly into students' brains were employed to 'dismember' and 'disembody' the participants' pedagogical inclusion of the body in my semi-structured interviews. Under the method, I traced psychophysiological conditions of phantom limbs, body integrity disorder, and the rubber hand illusion as embodied signatures from my participants' interview responses. The dismemberment and disembodiment revealed agential integrity of the body (i.e., representing and respecting the parts and whole of the body viewed as an agent in embodied pedagogies) and body ownership (i.e., the conscious experience of the body as one's own) as pedagogical gaps when educators consider the body in their teaching and students' learning. To fill these pedagogical gaps, a non-traditional application of fundamental movement skills (that promote embodied attentiveness and curiosity) and posthumanism in PE (such that educators and students gain an appreciation for both human and non-human bodies) are suggested as solutions and, in extension, anti(-)bodies for a PE in crisis.

Astronomy embodied education through the use of a Human Orrery

Emmanuel Rollinde

In this workshop, participants will embody the movement of celestial objects around the Sun. Science and mathematics notions related to kinematics and dynamics will then be learned as "new ways of moving" (Abrahamson & Sanchez-Garcia, 2016). As a group, participants will first be asked to engage into choreographies that represent different linear and circular rotations without any specific materials. Participants will hence directly experience the connections between the concepts of distance, duration and speed. They will then experience and discuss the relations between inertia, gravity force and acceleration through the use of different embodied tools (ropes, rollers, ...). Those precursor choreographies will then be compared to a scientific representation of the 'Human Orrery' (Rollinde, 2019), a chrono-photography of the Solar System. The Orrery is a medium that allows a precursor model of the solar system to emerge in the class (Weil-Barais, 2022). The Orrery may be printed at a "Human scale" in the courtyard (with a scale of one meter between Earth and the Sun) or on a A3 "printed paper". Celestial objects are then enacted by learners' bodies and by tokens respectively. We will then show that this representation makes it possible to bring to the classroom a "learning scene" where individual and collective learner bodies are blended with celestial bodies ("conceptual blending" or "mixing spaces" in the sense of Fauconnier & Turner, 2008). Videos of the use of the "Human Orrery" will be commented before participants experience the "printed" version only (for practical reasons) in one specific case: enacting planets and comet' trajectories will allow the notions of acceleration to emerge naturally. The workshop will conclude with a general discussion about the different use of the Human Orrery for mathematics and science embodied learning.

Baumgarten and Causal Rhetorical Creation: The Body and the Obscure

Christina Matthiesen

The German philosopher Baumgarten (1714-1762) is known for his coinage of the term *aesthetica* and for his contention that beauty resides in the act of cognition. He argues that aesthetics deals

with sensuous knowledge as distinct from logic. Sensuous knowledge is Baumgarten's groundbreaking, positive designation of indistinct and obscure concepts. Baumgarten in his major works on aesthetics, his dissertation *Meditationes* (1735) and his main work, the uncompleted *Aesthetica* (1750-58), explicitly draws on the rhetorical tradition, both by seeking union – as Cicero (“a marvelous agreement and harmony underlines all branches of knowledge”, *De Oratore* III, vi, 21) – but also by leaning on structural and contentual affinities with treatises of ancient rhetoric. Therefore, it is of no surprise that Baumgarten unfolds both the theoretical and practical side of aesthetics, including not only principles, but also, in *Aesthetica*, the aesthetic character, exercises and teaching. The theoretical side of Baumgarten's work is widely discussed. The exercises and teaching, on the other hand, are rarely the object of scholarly attention, even though these aspects are placed in the forefront of *Aesthetica* (§28-103). Here, Baumgarten among other things pays attention the role of the body, its movements and energy. In this paper, I unfold Baumgarten's notion of sensuous knowledge, non-hierarchical epistemic stance, and interest in systematic causal creation, focusing on his overlooked educational program for the aesthetic character, *felix aestheticus*, in *Aesthetica*. Here, Baumgarten emulates the rhetorical triad, *natura, usus, ars*, adding a vital section on impulse (*impetus*) in which he describes the significant role of an entangled and moving body and its relation to igniting the creative act and to inciting obscure, hidden and dis-integrated knowledge. Thus, Baumgarten's stance towards creation is (also) relational, resembling both causal intra-action and the ancient concept of chora.

KEYWORDS: Baumgarten, sensuous knowledge, body, entanglement, textbook.

“Being auditioned”: Exploring embodiment when speaking a foreign language.

Dr. Maria Luisa Perez Cavana
The Open University

The role of the body in teaching, learning and speaking a foreign language is an under researched topic in a field characterized by a strong focus on cognition and sociolinguistics. This paper is designed to contribute to a newly emerging line of inquiry addressing the move away from the pure linguistic approach to the phenomenon of speaking a foreign language and towards a more humanistic perspective. This new vision considers the whole person approach as a way to convey the complexity and multi-layered experience of language learning. Within this context, phenomenology, and in particular the exploration into the lived experience of language (*Spracherleben*), has been considered both as a relevant and as an under-researched approach. Aiming to contribute to the study of embodiment and learning foreign languages, this article explores the question: how is one's the own body experienced when speaking a foreign language?

This presentation contributes to the current research on foreign languages studies by expanding our understanding of what it means to speak a language as experienced in the body. It also contributes to the phenomenological concept of objectivation of the self by showing it from the sound perspective and thus challenging the traditional primacy of the look.

Bildung as the variation of perspectives in an embodied emotional field of tension between self and other

Andreas Nielsen, mag. art. in philosophy from Copenhagen University, Ph.D.-student at Aarhus University.

„Verstehen heißt nämlich: auf etwas zurückkommen können.“ Günter Figal, *Der Sinn des Verstehens*

„Daß es ein Vergessen gibt, ist noch nicht bewiesen; was wir wissen, ist allein, daß die Wiedererinnerung nicht in unserer Macht steht.“ Friedrich Nietzsche, *Morgenröte*

Bildung is associated with a person's openness to a field of possible other perspectives, a field of differences (Gadamer, 1990, p. 22). But how do possible other perspectives show themselves and what holds together that field of differences so that a sense of the general meaning of something is achieved over time? Based on an example from my fieldwork, I analyse how a field of differences is established and sustained between a pedagogy student and her supervisor during the internship in a Danish day care institution. I argue that the variative holding together of perspectives is not achieved solely by means of a cognitive or conceptual activity on the part of the subject, but owes its possibility to an embodied emotional horizon that is established in a field of tension on the border between self and other, i.e., in-between feeling and vulnerable bodies (Casale et al., 2020; Stöhr et al., 2019). It is the emotional intensity of the field that holds the student's attention and creates a play of differences over time. In that way, I hope to contribute to the understanding of Bildung of and through emotions (Huber & Krause, 2018), such as shame (Brinkmann, 2021a), and the passive or pathetic dimension of Bildung (Brinkmann, 2021b, p. 77), i.e., how we are exposed to the world and others before we begin to think about it. Furthermore, to supplement hermeneutics with a phenomenological analysis (Brinkmann, 2014) of the embodied dimension of understanding.

BODY, BRAIN, WORD. A Brain-based path with the Habits of Mind to enhance linguistic-communicative skills in future educators

Cappuccio G., Compagno G., Nicolosi S.

The alternation between neuroeducation research and related theories on the mind, within the national and international scientific debate, falls within the perimeter of that Embodied Mind Theory (Varela, Thompson, Rosch, 1991) which, for more than thirty years now, animates part of educational and neuroscientific research, focusing on a teaching/learning process that places the student's body at the centre. The learner's body is the threshold between outside and inside, "a medium of knowledge and communication with oneself, with others, with the environment" (Frabboni, Pinto Minerva, 2001, p. 164). Damasio had already underlined that «the mind exists within and for an integrated organism: our minds would not be what they are if it were not for the mutual action of body and brain» (Damasio, 1994, p. 21). The body is reaffirmed as a value that expresses the totality of the person as a "node of living meanings" (Barral, 1965, p. 177), a place of essential human existence where space, time, selfawareness, and relationships are interwoven. Brain-based language teaching approaches, such as Brain gym (Mac Lean, 1984; Dennison, 2008) and teaching activities consolidating the Habits of Mind (Costa – Kallick, 2008; Carr, 2012), are the coordinates of the research described here, conducted with 78 third-year students, attending the module on "Game teaching and planning, documentation and evaluation in childhood", within the degree course in Educational Sciences of the University of Palermo, in the academic year 2023-2024. Through the research process we wanted to verify the validity of the Brain-based and Habits of mind model aiming at enhancing students' linguistic-pragmatic

and communicative-strategic skills in the specific disciplinary areas covered by the research. This contribution is part of the broader research work conducted by the NEUROEDUCATION RESEARCH WORKING GROUP of the Department of Pedagogical Psychological Sciences, Physical Exercise and Training of the University of Palermo.

Body, sport and Inclusive education: focus group analysis of the 'Talent' project on how to recognise and support talent

Albanese Martina, Scolaro Ilaria, Maniscalco Lucia

Inclusive teaching in sport represents a fundamental perspective to ensure equity and participation of all students and social inclusion through sport (Fitzgerald, Hickey & Hodges, 2014; Hutzler & Sherrill, 2007). The promotion of inclusive education in sport requires a holistic approach, including teacher training (Sánchez-Alcaraz, et al., 2020) and the active involvement of students (Dinold, et al., 2019); considering that, as the construct of embodied education points out (Francesconi & Tarozzi, 2012), body consciousness does not develop naturally, but must be educated.

The educational spin-offs that the theory embodied education seem to envisage for the world of sport can be traced back to the enriched educational proposal (Pesce et al, 2016) in which the emphasis on the demands of bodily control and physical engagement and on strategic and tactical demands converge.

This is the aim of the Erasmus + project “TALENT”, within which two focus group sessions (Stewart & Shamdasani, 1990) with sports coaches and teachers were conducted in order to collect data on the procedures and opinions on dual careers of student-athletes and in particular on how to recognise and promote talent.

In this study, we report the outcomes of focus groups conducted with 13 primary and secondary school teachers and 13 individual and group sports coaches, in a blended mode, through a group interview consisting of 6 areas (introduction and background, talent identification, observation and evaluation, collaboration and communication, obstacles, final reflections).

Points of contact and divergence emerged from the FGs conducted with the teachers and coaches and the analysis of these led to the formulation of 38 statements.

This contribution is part of the broader research work conducted by the NEUROEDUCATION RESEARCH WORKING GROUP of the Department of Pedagogical Psychological Sciences, Physical Exercise and Training of the University of Palermo.

Keywords: Talent; Inclusive education; Pedagogy of sport; Body.

BORDER PEDAGOGY: TOWARDS AN INTERCULTURAL HUMAN ECOLOGY FOR A GEOGRAPHY OF RELATIONSHIPS

Fernando Battista

Can performing arts and Dance Movement Therapy create inclusive and intercultural contexts against the prejudice? This theme is central in this contribution, which has as its object an art based research (Barone, Eisner, 2011; Leavy, 2009), Border Pedagogy, an original methodological

process, in the educational/intercultural field. The underlying assumption is that the body and artistic languages can develop visions, effective, innovative and cutting-edge proposals on issues considered crucial for inclusion and interculturalism (Bourriaud, 2014). The research takes shape within the school context from reflections resulting from the use of art and corporeity to promote intercultural competences, and takes on the guise of a political-pedagogical project (Eisner, 1998). The aim is to analyse the ways in which inclusion can take place, change or modify prejudices and stereotypes so as to bring about significant and transformative changes in growth processes (Benasayag, Schmit, 2003). The research-intervention, followed a "mixed methods" preserving its qualitative nature, thus following the phenomenological and hermeneutic approach, and at the same time used a questionnaire (Pettigrew, Meertens, 1995), which characterizes the quantitative part and completes the research itself. Following the operational methodology of Dance Movement Therapy, and the performing arts, one of the themes that emerged concerned the discovery of feeling moved to a new perspective from which to view the world. Results have strengthened the choice of adopting such innovative integrated educational strategy for inclusion and lifelong learning as they produced an intercultural awareness in the interactions between the school and the local community.

Carnality of Listening and Listening Body Experience

Małgorzata Przanowska

In the workshop participants are introduced to the general notion of acouological education with a special attention paid to the practice of body mediated listening forms, for example a breathing listening, attentive feeling listening, empathic listening, musical (including body-rhythmed) listening. Participants will be asked to be involved with body-engaging, but not invasive, exercises that require a free space in the room. I would need also a projector and monitors for music listening exercise. But if this would cause too much organizational troubles leading to rejection of the workshop proposal, please omit these requirements. The workshop can be easily adjust to the room conditions at your disposal.

Workshop is design for educators of children and adults, trainers, coaches, psychologists, academics working with adult students – to anyone who works with people in widely understood educational dimensions and for those interested in acouological education experience, self-education, self-cognition, development of self-awareness and group dynamics, and deepening educational competencies.

Carnality of Listening in an Acouological Philosophy of Education

Małgorzata Przanowska

Promoting listening in education has fluctuated over the history of education since the ancient time: from acknowledging and insisting on listening as a basis for any educative experience (for example Pythagorean school of philosophy) to rejection of listening as a passive, obedience-based, and deprived attitude prone to abuse, oppression, and manipulation of people, including those participating in knowledge transmission. Deweyan opposition to the idea (and practice) of education based on students as passive, obedient listeners, has opened the question of listening as an active, inner participation needed for a reasonable educational experience. However, active forms of education seems to be also responsible for neglecting listening as a way of life that is crucial for human existence and education derived from this existential (and this also means carnal and bodily mediated) experience.

Such context inevitably provokes questions about the understanding of (and misunderstandings around) listening. It is one of the reason I started to ponder over the listening experience and notion that has led me to the concept of *acouological education* (from Greek *acouo* meaning both, listening and hearing). I use a dialectic understanding of listening as passive and active, and as a dynamic reality that overcomes dualistic approaches and their variations, including overcoming dialectics of the two. In such a way, there is a room for experiencing and understanding body as a listening reality: body listens, body speaks, body feels, body smells, body thinks, body initiates, body asks and gives responses, body react, and so on. But what if it is all possible, because what listens, feels, react, thinks, and is, is listening not reduced to the perception, to one of the senses? In my approach, I would like to show carnality of listening that can be grasp in the educational notion of an *acouological touch* juxtaposed with a physical touch experience.

Classical mechanics through multiple senses: On using an educational escape room to promote an interest in physics

Sebastian Kilde Löfgren, Jesper Sjöström Strobel, Andreas Johansson, Jonas Enger

In recent years, there has been a rising interest in using escape rooms in education. ¹² However, no educational escape rooms focusing on classical mechanics are present in the current literature. Further, as classical mechanics is an area in physics where students bring a plethora of previous embodied knowledge to the classroom, teachers need to aid them in reconciling their bodily experiences with the subject-correct ways of understanding studied phenomena. To this end, the current study explores how an educational escape room situated in an aviation museum can aid upper-secondary physics students in exploring key concepts in classical mechanics through multiple senses in a collaborative, game-based learning setting. Specifically, we ask how students make use of their bodies to make sense of and solve classical mechanics challenges in an educational escape room. We explore this question by conducting a qualitative study involving upper-secondary school classes. Data collected consists of video observations and follow-up semi-structured interviews. Using a physical sense of embodiment, we adhere to the notion that learning and conceptual understanding are grounded in the body.³ To identify different, increasingly powerful ways of understanding, we conduct a phenomenographic analysis⁴. Using this analytical framework allows us to identify how different embodied practices employed by the students allow for increasingly complex ways of understanding the phenomena faced during the escape room.

Collective Caring Relationality and Reconcili-action through Conscious Bodies Methodology

Danielle Denichaud

Conscious Bodies Methodology (CBM) is an adaptable, accessible, imaginal, intuitive and traumahonouring embodied practice, developed in the mid 1990's by Dreamwalker Dance Company Artistic Director Andrea Nann through her work with youth on the topic of refugee camps following genocide. Since these early years, CBM has been woven with Indigenous Teachings from Turtle Island and brought to thousands of individuals of diverse identities for the purposes of awakening embodied languages of collective caring and reconcili-action through the co-creation of inter-arts Positive Public Actions. The practice of CBM takes pedagogical form through the Cycle of Activations (COA); ¹³ specific intentions which evoke the mind, body, heart and spirit for deepening awareness and felt-belonging with self, community and Land. Through a practice of aesthetic embodied inquiry (Snowber, 2009, 2019), participants are guided to marvel

at the ordinary materiality of their physical bodies and living places using an immersive gaze of “radical amazement” (Anderson & Suominen Guyas, 2012, p. 234). CBM continues to evolve through the ongoing community work of the Conscious Bodies Core Ensemble, which unites dancers, musicians, visual artists, researchers, educators, activists, consultants and storytellers of diverse ancestry. Our research consistently demonstrates how CBM and COA welcome acts of kindness, intercultural empathy, holistic wellbeing, celebration across differences and embodied generative creativity into community spaces amongst folks of diverse identities and needs. Informed by our many years of working with artists and non-artists, across sectors, ages and cultures; we will share the foundational concepts and essential awarenesses of CBM through an embodied journey of the Cycle of Activations. Participants will encounter the language, pedagogy and embodied reflexivity of this perennial methodology, supporting community work in social justice, environmental and wellness education; child and youth care; rehabilitative and palliative care; artistic creativity; arts organizations.

Dance Movement Therapy at University: the reasons to introduce it in the curriculum for educators

Elena Mignosi, Department of Psychology, Educational Science and Human Movement, University of Palermo, Italy

I've have been managing for 14 years a “Body pedagogy” course for students attending the Master degree in “Long-life training for trainers” at the University in Palermo. It lasted 40 hours and it is included in the University Course curriculum. I would therefore like to present my training model, based on a Dance Movement Therapy (DMT) methodology and I will explain the theoretical and methodological framework related to the educational goals. The aim is to give professional skills to spend in different educational and social fields thanks to the mobilization of creativity , to the integration between the different parts of Self and to the development of the awareness and the "presence". These competences are activated by a DMT training, and by experiences through artistic and expressive languages. The students, through the artistic experience centered on the body, enhance the human and professional skills required for their future job. A DMT training activates, in a short time, new stories and new existential perspectives where it is possible give space to the recognition of the others, in a transitional area where to meet, imagine and create together. In this perspective, it is relevant the “group dimension”, which has in the same time the function of "containment" and "expansion" and that, within a relational field, allows the emergence of the trust, essential for the expression of creativity , thanks to the contribution of all. It is an innovative teaching way for the Italian university system, where the majority of lessons take place frontally and through verbal language, and it is the only art and movement-based course for educators in the Department where I work. In line with the model, I finally will present the evaluation tools and, briefly, some of the results achieved, including narrative and qualitative products of participating students.

Direct Inclusion and Participation: On a Pedagogical Practice of Participatory Affordances

Urd Thejl Ploug Skiveren Cand.psych., PhD-fellow at Roskilde University

Keywords: Newly arrived migrant children, children’s perspectives, ZoP, guided participation, affordance.

Children moving to Denmark are categorized as ‘newly arrived migrant children’, whether they migrate because of war, work, or other factors. Since the summer of 2016, several municipalities across Denmark have enrolled newly arrived migrant children from grade 0 to 6 directly in regular class. While there are many reasons for doing so, we have little knowledge on if and how these children can participate in Danish school practices without speaking the local language. The presentation is based on my PhD project and investigates this knowledge gap. Research on the topic is driven by discussions on the advantages and disadvantages of the two reception models: reception class or direct enrolment in regular class. The discussions centre on the placement of these children in school. Instead of asking where the children are enrolled, this presentation zooms in on what newly arrived migrant children are enrolled in and how adults surrounding newly arrived migrant children can support their participation. This is done by combining Vygotsky’s concept of the zone of proximal development explored through Rogoff’s notion of ‘guided participation’ with Gibson’s notion of ‘affordance’ and the invitational character of the environment. By combining these three theoretical concepts the study’s main contribution is to develop a vocabulary, or rather, a perspective for teachers and other practitioners to adopt when including newly arrived migrant children in school. This perspective will help teachers and practitioners to extend the children’s zone of proximal development through guided participation in school activities, even as these children’s participation are hindered by a language barrier. The aim of the presentation, thus, is to explore a possible pedagogical practice of non-language-based participation by posing the question: how can we organize the environment to afford newly arrived migrant children’s participation in school?

Education on and off-screen. A phenomenological analysis

Joris Vlieghe

In this paper I want to take a position vis-à-vis the current tendency, in the wake of the pandemic, to substitute face-to-face teaching with online instruction mediated by conference software, recorded classes and other digital means. I argue that in both cases the bodily dimension of education plays out in radically divergent ways. Where the former mode of delivery allows for fundamental pedagogical operations such as (1) sharing one’s love for the world as a teacher, (2) addressing students as belonging to a collective and as new generation, and (3) making newcomers to the world attentive to things that matter (Arendt 1961, Masschelein and Simons 2013), these operations are under serious threat when education goes on-screen. One cannot show in flesh-and-blood what matters because one is constantly hiding between a screen (that ‘screens off’ from world-exposure) (Agamben 2017). Staying attentive as an individual on-line is something altogether different from being attentive when one is a part of a collective of bodies. Hence, when digital devices mediate the relation between ourselves on the one hand and others and the world on the other, this makes all the difference phenomenologically speaking (Friesen 2011): we literally experience differently what it means ‘that there is a world out there’ or ‘that something is of importance’ in the world. Digitization comes with a poverty in experience, a fear for discomfort and an obsession with safety (Han 2021), as well as informational solipsism (Thompson 2005): we are constantly thrown back on ourselves as consumers of information, we constantly immunize ourselves against any (unpleasant) confrontation with the world and we end up no longer living in one and the same world. Digitization comes with a loss of real and meaningful bodily exposure to others and the world, and hence it destroys the possibility of profound educational transformation.

Education through corporeal mediative practice. Giving voice to the body for a renewed culture of well-being meant as being-factor-of-goodness

Rita Casadei – University of Bologna

The workshop through corporeal and meditative practices (QiGong and TaijiQuan) is meant to explore the importance of embodiment in education specifically in the area of transversal competences and life's skills, going beyond strictly subject-related issues and technicality. Actually they are characterised by being pathways of understanding, experimentation and transformation of the person (and his-her system of interactions: envisioning-learning-understanding-feeling-behaving). From the Eastern philosophical-experiential perspective, for which unity, interaction and integration constitute a fundamental matrix on which to root aspiration, thought, action, Embodiment in Education can facilitate the recognition that attention has a cognitive nature, but also a sensitive one, so that the subject who knows is able to understand its indissoluble wholeness. From the pedagogical-educational perspective, this acquisition helps prevent the risk of a fixation on subject content and proficiency, in itself and an excessive focus on competences in a merely technical-mechanistic key. The consideration of the unity between mind-corporeity in educational and training processes makes it possible to consider the subject of knowledge not as a performer but as “*being*”, thus legitimising the question “who is he-she who knows?” a key-question - from West to East - placing educational processes as relational inter-actions. This finds correspondence with the four pillars of education (Delors Commission UNESCO, 1996): learning to know, learning to do, learning to live together, learning to be. Eastern tradition moves from the three irremovable key-points such as body, mind and breath, to be aware of, to train and coordinate together. The workshop will focus on: posture adjustment - aligning the body segments, realizing the force that anchors on the ground and the force that extends upwards; regulation of attention - activating attention, driving it to specific points and keeping it stable; regulation of breathing - observing the presence of the breath and coordinating it with movement, in a slow and steady rhythm. Every exercise is bound to enhance awareness of one's own posture and correct it, in different situations: standing still, walking, sitting, laying. Every exercise aims to let the person realise and feel:

- “I can find my place correctly in the space”
- “I can lead my attention to the gesture or even in static situation”
- “I am able to listen the rhythm of my breath, feel the right tension of my muscles, feel what is near, inside, and outside my bodily experience”

Effects of Movement and Kinesthesia on Violin Group-Learning

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This paper aims to explore the effects of movement and kinesthesia on beginner violin-group players developing body self-awareness and whether it makes their first encounter with the violin easier. The 4E cognitive approach (Newen et al., 2018) considers the root of cognition to be in movement that is fundamental to interacting with the environment. From this perspective, the body (Merleau-Ponty, 1945/2002) is the tool through which individuals communicate and share

their experiences intersubjectively. This phenomenon also occurs in collective music-making where groups of individuals intentionally share music as the common object of their experience (Carr, 2019). Learning in groups through movements makes lessons fun and increases motivation (Lengel & Kuczala, 2010) to repeat those movements necessary for instrumental learning, while performing them induces sensory pleasure (Deleande, 1993). There is little research on the relationship between violin group-learning through movement and body self-awareness development and whether it makes one's first impact with the violin easier.

Qualitative methods including case studies, focus group interviews, children's drawings, and observation were adopted. Data were collected from audio-visual material and field-notes taken after each of the fourteen sessions held over a five-month period. Ninety children, all violin-beginners from fourth-year Italian primary state schools, were divided into four Movement and four Non-Movement comparison groups. All groups memorized the same songs to be played on the violin by imitating the teacher. The Movement groups learned the songs through movement and kinaesthesia in peer games and, after engaging in musical activities, participated in focus group interviews conducted using a phenomenological approach.

The findings show that the Movement groups had more fun than the Non-Movement groups, developed greater body awareness with regards to holding the violin and bow, discovered tactile pleasure, were more interactive with each other, and managed the learned activities independently.

The Embodied Breath: An interactively inspirational, motion-sensing workshop

Randal Persad

Breathing is our constant companion from the first gasp of air at birth to our last breath at the time of death. Intimately linked to our physiology, biology and psychology, respiration gifts us with life and the vitality of living with one another.

Breathing habits are influenced by daily activities, response to stressors, exercise, along with various medical conditions such as asthma, sinusitis and chronic pain. Mouth breathing and rapid, irregular breaths, even holding the breath, can develop over time. When symptoms such as headaches, brain fog, nausea, gastrointestinal irritation, hypertension, insomnia, and generalized fatigue are noted then these habitual breathing patterns have become unhealthy.

Cultivating breath awareness is about correcting these dysfunctional and deformational habits. Attention can be paid to the physiological, anatomical and biomechanical functions and forms of breathing correctly. Breath awareness needs also to focus on positively inspirational and expirational feelings and flows. Without this inner consciousness, old breathing habits die hard.

In this workshop we will explore the animation of breath through the *Function2Flow* Practice framework. This framework emphasizes respiratory kinetics (whether visibly evident or discernible through instrumentation, breathing motions), kinematics (patterns of inspiration and

expiration), kinaesthetics (internal registers of breathing motions), and energetics (flow and modulations of energy). These registers, simplified in terms of *function, form, feeling and flow*, are the heuristics of breathing practices that can be taken up experientially, therapeutically and educationally.

Participants will be guided through these Function2Flow registers to experience the manner in which breathing consciousness can be cultivated. The workshop format will allow participants to understand the Function2Flow framework and discover for themselves how breathing can be both involuntary and voluntary, habitual and modifiable, mechanical and meaningful. The workshop will conclude with suggestions for scaling-up breathing practices into the domain of education and teacher self-care.

Embodied cognition and classical dance training

Capaci Claudia

Key words: Embodied cognition - cognition generating cycle - classical dance training- ADHD-inclusive learning/teaching methods.

New perspectives in cognitive science leads to the overcoming and flattening of the mind-body dichotomy, namely to a unitary vision of the human being in which the two components interpenetrate, coexist and coincide: the embodied cognition (EC).

This theoretical approach has roots in motor behavior and rejects the traditional view of cognition as computation over representations claiming, first that cognition depends upon a particular kind of experience that comes from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded (Varela, Thompson, and Rosch ,1991). The EC postulates that understanding cognitive processes entails understanding their close link to the motor surfaces that may generate action and to the sensory surfaces that provide sensory signals about the environment and generate the new conception of cognition as *embodied action*. Cognition involves acting with a physical body on an environment in which that body is embedded: motion influences perception, which in turn influences future motion, which then determines new perceptions, and so on generating a *perception-action-cognition cycle*.

The Phd research project *Health promotion in ADHD through classical dance and foreign language learning* was born from the hypothesis that there is a similar functioning between dancers and subjects with ADHD: a motor impetus, a common categorical imperative that pushes towards movement. If cognition depends on a body's sensorimotor capacities as claimed by the EC, we can postulate that training the sensorimotor abilities implies to build and train cognition. Classical dance and the foreign language learning could work as organizers of the need of movement and the training path followed by dancers could represent a field to be explored for the codification of new inclusive learning/teaching methods.

Embodied education and interrelation with Donkeys Assisted Therapy (DAT)

Damiano Biscossi Pedagogist, APPM Onlus Educator into a residential unaccompanied minors' community

Elena Mignosi , professor in the Elena Mignosi Department of Psychology, Educational Science and Human Movement, University of Palermo, Italy

I work actively into Donkey Assisted Therapy with different people and in different context from a long time. In the last 3-year prof. Mignosi setup a Master in Unipa aiming to value the DAT in training of trainers. We cooperate since about 20 years into DAT training courses, sharing an ecological and zooanthropological perspective. The relation with donkeys is fundamental for human vs animal body-to-body communication. Between animals is known that they use the body for communicate, something that we know before the “speaking age” and that we seem forget in the growth. Communication, even between human beings, is multimodal and the non-verbal dimension is fundamental in giving information on the quality of the relationship, but for the most part we react to it and use it unconsciously. The donkey allows us to go back in the past time and better focus on body listening, presence and awareness. The donkey is a calm and empathic animal and before acting take his time to think and to feel . He teaches us to embody the thinking and the action. This animal enables us to slow down and enjoy the flavour of the life. From a cultural perspective we say that donkey is stubborn, instead he wants to be convinced: embodied the decision to do things together and for him. We will propose in the workshop role play, simulations, games on possibile embodied relation with donkeys (where the donkey have also a symbolic meaning) . Furthermore, there will be practices on body listening and awareness and exsperiences based on imagination and creativity, individually and in group.

Embodied Education from the point of view of a theory of Bildung

Prof. Dr. Malte Brinkmann
Johannes Türistig
David Contreras

The round table presents an approach to Embodiment and Education from the perspective of a German-speaking General Pedagogy. As a special current Phenomenological Educational Science can look back on a history of more than 100 years. In this theoretical tradition, the English term "education" is systematically differentiated as Bildung and education. In three presentations, Bildung theory, educational theory and systematic considerations will be taken up to reframe the connection between embodiment and education.

The first lecture (Malte Brinkmann: Embodied Bildung - Plessner's concept of embodiment as a practice of Bildung) aims to make it plausible that embodiment can be defined as the practice of giving oneself a form. For Plessner, eccentricity (Exzentrizität) and brokenness (Gebrochenheit) take centre stage as moments of negative experience. This is why, compared with Merleau-Ponty, it can be made fruitful for Bildungtheoretical perspectives. The concept of Bilk Bildung takes up precisely this aspect at its core. It allows embodiment to be understood as formatio, as a reflexive and negative statement and positioning in and towards the world. Plessner and Merleau-Ponty leave the question open of how body schema or habits and habitus can be changed by educational practices. General pedagogy understands this question as a central pedagogical issue. It highlights the difference and correlation between education and Bildung, which will be addressed in the subsequent lectures.

The second lecture (Johannes Türistig: Education as a practice of, with, and through the body) will present educational theory considerations based on Bourdieu's theory of habitus as a social theory of embodiment. The habitus represents an embodied relationship to the world. It arises through experiences made physically and is expressed both through and with the body. Drawing on Bourdieu, education can be characterised as a practice that is performed with and

from the body and is directed towards the body. Bourdieu shows that habitus, hexis and ethos come together in a special way in education.

In the third presentation (David Contreras: Practising the practice - an educational theory perspective on the repeated practice of movements), Practising is understood as an embodied and embodying practice in which people give themselves a form in community. Repetition and negativity take centre stage as fundamental dimensions of the practice experience. In line with G. Buck's educational theory and the concept of negative experiences, events in repetition are seen as Bildung-relevant moments in which practitioners can reflect on their sedimented movement habits. An experience of Bildung and a change of body schema or habitus can thus become possible.

Embodied Education In Cooperative Learning. Exploring the Effect of the Jigsaw Method and Conceptual Maps on Memory and Executive Functions

Elisabetta Fiorello, Giorgia Pinnello

For several decades, thanks to interdisciplinary dialogue among pedagogy, cognitive sciences, and psychology, the idea that knowledge and learning evolve in a dynamic relationship between the mind, body, and environment has strengthened. This theoretical perspective, known as embodied education (Kosmas, 2018; Shapiro, 2018; Bengtsson, 2021), strongly contrasts with the rationalist and dualist positions rooted in Cartesian and Kantian philosophies (Macedonia, 2019) it is now widely acknowledged in educational contexts (Thyssen, 2019; Kiefer, 2012). If it is true that cognition is always necessarily grounded in a physical dimension, we also gain awareness of our corporeality through the *lògos*, namely through the rigorous and rational exercise of our cognitive abilities. Similarly, the scientific literature supports the idea that cooperative learning practices -including the Jigsaw technique (Slavin, 1980; Meng, 2010)- positively influence through collaboration and social interaction student learning outcomes by neurophysiologically modulating the processes underlying information retention (memory), planning, problem solving, and time management (executive functions) (Van Dat Tran, 2019; Johnson, 1998). Nevertheless, the transformation of scientific theory into concrete educational practices that take into account what Merleau Ponty called embedded phenomenology together with the instances of cooperative learning remains a preeminent challenge for contemporary educators. Building on these premises, an educational programming has been developed to explore how cooperative and metacognitive learning, specifically through the Jigsaw model and the use of concept maps, coupled with the bodily engagement of 173 future secondary school support teachers, could impact memory and executive functions in crossdisciplinary competency areas. The study specifically investigated if using visual learning strategies could have a positive effect on students memorization, the enhancement of executive functions, and their proprioceptive skills.

This contribution is part of the broader research work conducted by the NEUROEDUCATION RESEARCH WORKING GROUP of the Department of Pedagogical Psychological Sciences, Physical Exercise and Training of the University of Palermo.

Embodied experiments for an Education of the Senses

Charlotte Sermeus, Paul Nieboer, Alexander Pessers & Joris Vlieghe

In our presentation, we would like to share the results of a collective experiment which, is part of the research-project 'Towards an Education of the Senses: An Alternative pragmatic view on STEAM'. Our aim is to reconsider STEAM education through the lens of an 'Education of the Senses' (Todd et al. 2021). Here, immediate learning outcomes give way to an intergenerational caring for the world we share through an embodied pedagogy. This project builds further onto the ideas of Bruno Latour (2018), who argues that today's environmental and social problems are a consequence of the irreversible destruction we ourselves have brought to the world we inhabit through our postenlightenment endeavours. Our take-away from Latour is that we must learn to relate to the world differently, and we aim to do this through our refashioning of STEAM. In this refashioning we want to emphasize the senses and their relation to the body and lived experience (cf. Affifi 2020) During an experimental workshop prior to the conference, we will conduct experiments entailing collective exercises in attention (Ingold 2018), the use of our senses and reflect on how bodily expressions can affect the STEAM curriculum (Cf. Lewis and Hyland 2022). These experiments lead to a collective design exercise wherein we will try give form to an embodied curriculum. An example of a previous experiment entails the collective and attentive tasting of water from around the world, as is done with wine. After the tasting, a successful attempt was made to develop a collective and senses-inspired vocabulary to describe the subtle differences in taste. For our presentation we want to report our findings from our collective experiments and reflect on them.

Embodied interactions in virtual reality environments for improving spatial reasoning

Anna Re, Giuseppe Caggianese, Giuseppe Città, Luigi Gallo, Manuel Gentile, Salvatore Perna¹, Crispino Tosto, Agnese Augello

Spatial reasoning is a complex set of cognitive processes that enable us to create and manipulate mental representations of spatial objects, their relationships and transformations (Clements & Battista, 1992). This skill is also crucial in various daily tasks, such as navigating through physical space, interpreting maps, and understanding geometric concepts. In this sense, spatial reasoning and geometry are closely interconnected, where the latter could provide the potential to enhance educational experiences in spatial reasoning (Lowrie & Logan, 2018). Successful management and resolution of problems concerning 2D representations of 3D objects depends on a strict coordination between spatial skills (e.g. spatial visualization, orientation, mental rotation, etc.), domain-specific knowledge, and domain-based analytic reasoning (Fujita et al., 2020; Pittalis, Christou, 2010). Furthermore, spatial skills play a significant role in STEM disciplines (Stieff & Uttal, 2015) by facilitating a deeper understanding of geometric and spatial concepts and enabling individuals to manipulate spatial information. As argued in several research (Città et al. 2019, Thom et al. 2021) spatial reasoning is naturally embodied, consequently, the use of embodied tasks as a pedagogical approach finds its effectiveness in the basic principles of embodied cognition. Indeed, according to this framework, it is necessary to anchor the learning of concepts related to STEM disciplines, more specifically geometry, to dynamics afferent to the body. In this sense, the use of virtual reality may represent an opportunity to improve spatial reasoning skills by enhancing bodily engagement through the creation of three-dimensional and multimodal representation (Jang et al., 2017). Accordingly, the aim of this presentation is to show the preliminary results of an educational intervention conducted in a low secondary school setting in which we will explore the use of virtual reality for training student's spatial reasoning skills within the theoretical framework of embodied cognition.

Embodied Learning And Education From a Latin American Perspective

Chair: Ximena González Grandón

Participants: Mariana Romero Andrade, Joao Gabriel Almeida, Antonio Pinilla

Recent advancements in cognitive sciences, particularly stemming from the conceptualization of the embodied mind, enactivism, and ecological psychology within the 4e turn, have reshaped our understanding of learning as hybrid processes occurring within living bodies during interactions situated in specific sociocultural and ecological contexts. This round table engages in a dialogue that integrates these perspectives with various educational methodologies to comprehend the principles guiding the development of the role of the body, bodies, and context in teaching, instruction, didactics, and designed interventions. Examples include empathy in inter-bodily performativities, proprioceptive and embodied learning in ecological landscapes, methodological embodied learning experiences, convivial learning, enacted, embodied, and embedded dimensions of our ethical lives; and facilitating cross-cultural dialogues of knowledge within science and technology. In response to contemporary needs, there is a pressing demand to foster discussions between the evolving embodied and ecological cognitive sciences and the education of situated agents with bodies developing in real-world and community relations. This round table aims to bring this dialogue to the forefront, seeking common horizons that can reconfigure education in the present to address the real challenges faced by worldwide communities. The shared horizon involves a reconsideration of conventional teaching styles, where students passively receive information while seated at their desks. Instead, the round table advocates for examining the educational implications of transdisciplinary perspectives, weaving together neuroscience, engineering, psychology, and cognitive science. The objective is to create diverse learning environments that showcase their relevance to pedagogy, thus transforming the dynamics of teaching and learning.

Embodied learning as an ecological practice

Sabina Enéa Téari

What is the foundational impulse for my engaging with the world and where does it come from? How can we get past the alienation between human and non-human bodies and resist the binaries? How do we access a tangible sense of interconnectedness in any learning experiences? Embodied learning could be described as a way to perceive and process information that is available to us through our multilayered perception: physical senses, thinking, emotions, intuition, but also as a gesture of extending the learning and knowing body beyond the boundaries of our skin, towards the alliances with other knowing subjects, human and more-than-human. When the mind is disconnected from the felt-experience of the body, we have little sensitivity to the living worlds within and around us. Our bodies are the earth in human form. Like the earth, we too are processes, beings in becoming, holobionts with all the ecological possibilities this implies. Mainstream practices of agriculture bear uncanny resemblance to those of mainstream education, with the long rows of tables and chairs ready for a master plough to introduce the seeds of knowledge with standardised methods into inanimate matter, to achieve controllable results, to yield planned harvests of a specialised monoculture. A very different phenomenon of a forest garden - a practice of regenerative agroforestry - disrupts one-dimensional thinking and

contributes to a more vibrant understanding of what agriculture can be. Caring for the soil and biodiverse interconnected relations, stepping aside and letting the (body of the) soil be the farmer. Following this analogy, embodied learning as a practice of radical attentiveness within and without, attempts to embrace the multitude of living epistemologies and offer paths to decolonize mind-body relations, let go the obsession with progress at the expense of affective, emotional, physical, and other needs of the body.

In this short intervention we will offer some experiential findings and practices connecting regenerative agroforestry and embodied learning from educational formats by Foresta Collective. (Our learning formats for adults: www.laforesta.co/seasonal-academy and for children: www.laforesta.co/foresta-kids)

Embodied learning in a Drama-in-Education environment for historical empathy: An action research in the Greek Context

Katerina Kosti, Member of Teaching and Laboratory Staff

Nowadays, there is a growing tendency among history teachers and historians to teach history and create new approaches to educational material, with an emphasis on active forms of teaching (Kosti & Papaioannou 2020). These views treat the student as an active recipient and agent of historical thinking and are based on modern learning theories, with the aim of emphasizing the relationship between learning historical events and building metacognitive skills to cultivate students' historical understanding and perspective taking (Kosti 2016, Saye & Brush 2002: 78, Davis 2001: 6, Foster 2001: 171 and 175-176).

Visits to libraries and archives, museums and archaeological sites, use of oral testimonies, historical novels and cinema, Information and Communication Technology and the Internet are some of the new learning environments suggested for the development of students' historical thinking (Levstik & Barton 2011). Drama-in-education interventions as well as role plays, simulations etc are also suggested for delving into the meaning of historical terms and concepts such as historical interpretation and empathy (Shemilt 1984: 66-78). All these options are functions between embodiment and history education that could cover developments in the understanding of the engaged being in the historically experienced past (Kondoyanni & Kosti 2011; Kosti, Kondoyanni & Tsiaras 2015).

The action research study presented in this presentation illustrates how drama-in-education might be used to enhance secondary students' historical empathy in Greece with embodied processes. Since embodied learning observes the body movements, the expression of students' emotions, their mental engagement with the subject matter, the students' ability to apply the acquired knowledge in new environments and their collaboration (OECD 2018), which are elements crucial for empathy, the aim of this research is to highlight the relationship between historical empathy and embodied learning in the drama-in-education environment.

Embodied meaning making in informal science learning

Sara Price, Rhiannon L. Thomas Jha, Margaret H. Laurie, Andrew Manches

While the value of hands-on learning is well recognised for early years education, embodied learning presents new theoretical and methodological approaches to understanding how the

particular action and hands-on experiences we design for children are important in fostering conceptual development in domains including science. In situ sensory experiences can offer 'embodied tools', which provide the basis for the internalisation of multimodal sensorimotor representations that serve as a 'simulation' of those experiences (e.g., Barsalou, 2008), and for how we communicate and reason, supporting the link between action and abstraction (e.g., Weisberg and Newcombe, 2017). However, methods for gauging the value of physical experiences for learning and identifying specific design guidelines from this work remain challenging. This presentation speaks to this through two empirical cases from recent collaboratively led research-practitioner studies. The first examines young children and families' bodily based interactions around exhibits in a science museum and identifies how these experiences underpin their gestural and verbal communication of science. The second examines the role of adult and peer embodied communication in scaffolding young children's science learning activity and science communication in a science centre. Drawing on these cases we: i) demonstrate the role of specific sensorimotor action experiences in shaping children's later science communication (body, gesture and verbal); ii) illustrate the insights this provides into children's thinking and understanding in the science domain; iii) explore the role of adult and peer gesture and action in scaffolding children's science learning activity and communication; and iv) identify guidelines to inform the design of digital science exhibits, activities, and adult facilitation. We reflect on ways in which an embodied learning approach presents exciting implications for museums through rethinking how we design exhibits to nurture embodied cognitive resources, and attending to how science communicators and learners use their bodies to meaningfully communicate what they understand.

Embodied Music Pedagogy

Dr. Melissa Bremmer

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Background: Even though movement is an integral part of music education (Bremmer & Nijs, 2022), the findings and concepts from the emerging embodied music cognition paradigm (e.g., entrainment, alignment, and prediction) have scarcely found their way to researchers and practitioners in music education. However, these concepts can support practitioners in developing music learning activities that encourage pupils to shape their experiences of linking sound and movement in a meaningful and fulfilling way. Furthermore, interpersonal entrainment and alignment have the possibility to heighten a sense of belonging and stimulate participatory sense-making (Bremmer & Nijs, 2022).

Workshop: During the workshop, participants will be familiarized through hands-on activities with the key concepts of the theory of embodied music cognition. They will also engage in a series of carefully selected and built-up musical activities, illustrating how those concepts can be applied in music education. Moreover, activities during the workshop will foresee in space for participant discussion.

Application music education: This workshop offers experiences with musical activities based on the theory of embodied music cognition that can be applied in the music education practice of participants. Furthermore, through the combination of theory and practice participants are also challenged to critically reflect on music and movement in the context of music education.

Embodied Precision Education: Tailoring Education to the Unique Students

Sarah Bro Trasmundi

In this presentation I explore the emerging paradigm of precision education, a student-centric approach designed to alter the mainstream one-size-fits-all model of education (Tempelaar et al, 2021). Precision education, also referred to as personalised education, mainly exploits the power of data analytics and technology to gain insights into individual students' learning styles and interests. I stress the importance of integrating cognitive ethnography (Trasmundi, 2020) with big data obtained through wearable technologies and other quantified self-applications. Through cognitive ethnography, researchers can delve into the unique learning experiences of students in situ, encompassing physical and experiential processes, along with sensory engagement. This embodied and ecological approach to personalised learning trajectories enables a comprehensive understanding of how students creatively interact with their environment. Key components of this Embodied Precision Education thus encompass qualitative and quantitative insights that gauge students' embodied performance, behavior, and engagement. To demonstrate this approach, I present ethnographic data of students who are engaged in reading. Some students use expressive gestures to illustrate a point, choose alternative seating positions for comfort, or even incorporate tactile elements like textured bookmarks, some prefer reading aloud, others silent etc. These embodied actions provide valuable insights into the students' learning styles and preferences. Individualised learning strategies tailored to each student's unique attributes, further emphasise the importance of recognising diverse needs and preferences. The flexibility of learning pathways accommodates students to progress at their own pace, with additional support or challenges provided as needed. The ultimate goal is to create a tailored and effective educational trajectory that resonates with each student's individuality and fosters a deeper understanding of the material.

Embodied Purpose, Cosmological Purpose: Panpsychic considerations on Embodied Education in Cosmological Evolution

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This paper is a preliminary investigation exploring embodied education from the perspective of Phillip Goff's (2023) "teleological cosmopanpsychism," "the idea that the universe is a conscious mind with purposes of its own" (105), whereby "the universe fine-tuned itself to allow for the emergence of life billions of years in the future" (132). Indeed, what role, if any, does embodied education play in such a purposive universe? Are there any plausible links between educational and cosmological purpose? If so, why should this matter?

To address these concerns and fill in the vast gap between cosmological and educational purpose, this paper will be in three parts: First, I want to explain Goff's (2023) conception of panpsychism, "the view that consciousness pervades the universe and is a fundamental feature of it" (50), and why I believe it is important. What does it mean for education's purpose to be grounded in consciousness? Second, focusing on embodied consciousness (Sakuta, 2018), I propose a thought experiment to highlight an "educational" encounter between the human and

the octopus to extend Sharon Todd's (2023) thinking around touch/body sensation/living beyond the human. Peter Godfrey-Smith (2017) asks, "What does it feel like to be an octopus? Does it feel like anything at all? ...How can the fact of life feeling like something slowly creep into being?" (77-8). Indeed, if the octopus can feel, touch, and think, then can we say it too has an embodied "educational" experience? To highlight this "educational" encounter, I will also draw from the Academy Award winning documentary, "My Octopus Teacher" (Foster, 2020) theorizing embodied education as trans-human. Finally, returning to Goff's (2023, 2019) panpsychism, I theorize that the purposive links between the educational (as trans-human embodiment) and the cosmological to suggest the reason education matters is because it an emergent aspect of cosmological evolution itself- i.e., from an autodidactic non-living universe to a living "educational" universe whose concern is, "to make reality better" (138). The pedagogy of this concern will be addressed.

Embodied Scaffolding: parent-child interaction in learning to count

Julie M Smith, Natalie Flint, Timothy Jay, Andrew Manches

The metaphor of scaffolding, with significant currency in educational research, originally described mechanisms by which an adult enables a child to accomplish an activity they could not otherwise achieve independently (e.g. Wood, Bruner & Ross 1976). Scaffolding fades as the child internalises strategies for similar tasks. Whilst scaffolding literature has focussed on verbal support, there has been recognition of multiple modalities such as gesture, facial expression, etc. (e.g. Goldin-Meadow & Alibali 2013). Embodiment theories, however, offer a novel lens to understand the cognitive significance of these modes, and how they might support learning. This study therefore explored the embodied nature of scaffolding in a foundational early mathematics task: counting 'how many'. Overarching questions were: what embodied resources do children and adults employ when counting, and which of these might children internalise and employ across numerical contexts? Study data included 8 videoed observations of parent-child dyads (3-year-olds) counting objects in three tasks of increasing difficulty. Tasks were designed for parents' agency in task environment and support. Recording took place naturalistically at home. Analysis revealed rich, interwoven, modes of parent-child interaction and communication, from body-positioning and gesture to eye gaze, facial expression, and intonation. Cognitive support was often inseparable from emotional (e.g., guided hand for pointing). Some embodied scaffolding was context-specific (e.g. moving objects in front of children), some applicable for counting across contexts (e.g., lining objects up, tapping objects as counting), and some relatable to research exploring more developed numerical concepts (nodding to keep track when counting/adding; gestures encircling objects to represent the whole collection). The study highlights the underexplored concept of embodied scaffolding, and the potential to unpack complex ways in which more knowledgeable others (e.g., parents/teachers) are able support children's learning: scaffolding children's success in specific tasks, as well as resources underpinning conceptual and emotional development in mathematics education.

Embodiment in Higher Education: A Cross-cultural Case Study of Theatre of the Oppressed in Academia

Francesca Aloï

This paper explores the Cartesian division between mind and body and its effects on higher education. Given a traditional dearth of body-centered curricula in universities, the paper analyzes how Theatre of the Oppressed (TO)—a collection of techniques first developed by Brazilian artist Augusto Boal—can be a useful methodology for implementing an embodied education at university. Such embodiment is crucial if we want to adequately acknowledge and address diversity while at the same time favoring a holistic pedagogical experience for university students, thereby stimulating genuinely transformative learning.

With data collected in the context of my PhD co-tutorship at University of Bologna and at Universidad Complutense de Madrid, I will present the findings of a cross-cultural case study conducted as part of the observational research I carried out in three universities in Italy and Spain.

Through analysis of the fieldwork completed across seven courses where TO is implemented in different academic disciplines, this study argues that TO can be used as an embodied critical-pedagogical strategy to support anti-oppressive, socially just, and emotionally attentive higher education.

Informed by Freire's critical pedagogy, this research concludes that it is necessary to re-evaluate the role of the body in university education and that universities should operate as spaces where students can rehearse active participation in a democratic society. Incorporated into broader university curricula, TO could be a powerful instrument in restoring an understanding of the body as inextricable from the mind, fostering in this way teaching practices that go in the direction of what the writer Eduardo Galeano refers to with the term "sentipensante", the ability to act without separating mind and body, reason and emotion.

emBODYed theater: a theatrical workshop on the body through the body

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The contribution investigates the use of performative drama-based methodologies as a tool for the involvement of the body within the educational context, particularly the school context. Performative methodologies, through active participation in situations, consider bodies not mere materialities endowed with physical properties, but lived manifestations of life, dense and constructors of meaning (Francesconi & Tarozzi, 2012). The theatre, by implementing the 4Es of embodied cognition: embodied, embedded, extended, enactive and at the same time remaining open to further Es, such as ecological, emotional, empathic, existential (Gallagher, 2023), makes possible the emergence and expression of complex and unconscious concepts, which cannot be communicated in words (Butterwick & Lawrence, 2023). The body, emotions and imagery involved in performative theatrical methodologies thus become starting points for the initiation of global and holistic educational, learning and transformation processes (Brinkmann, 2021; Butterwick & Lawrence, 2009) of subjects.

The results of the data analysis of a theatrical workshop on the topic of the body are presented from this theoretical framework. The participants, students from a lower secondary school (the

Italian equivalent of sixth, seventh and eighth-grade class) in the province of Bozen (Italy), lived and performed in the school building for three consecutive days.

The instruments used in the investigation are logbooks, informal interviews, and performance observations.

The data analysis focuses on the involvement and participation of the body in the theatrical performance activities and the knowledge generated by the body (Nicolaidis, 2023).

EMBODYING DIGNITY Fostering Salutogenic Praxis with Educators through Somatic, Compassionate and Eco-Spiritual Pedagogies

Danielle Denichaud

This presentation will share the current findings of ongoing PhD research in the area of pre-service and inservice teacher health education; specifically, the piloting of a novel holistic health curriculum and salutogenic pedagogical approach which centres embodied, compassionate relational and eco-spiritual pedagogies. This research is based on the premise that the pursuit of health education for personally significant, equitable and regenerative wellness in the 21st Century requires an “intimate knowledge of suffering” (Akhavan, 2017), and thus must engage with social justice and human rights (WHO, 2011), regenerative sciences and earth stewardship (Bush, 2019; Macy & Brown, 2014; Shiva, 2015, 2022), peace and compassion across difference (Akhavan, 2017), alongside the healing of intergenerational trauma and chronic degenerative disease (Hübl, 2020, Mate 2022). The holistic health curriculum and pedagogy explored in this research, entitled *Embodying Dignity*, centers the subjective embodied experience as the unifying site where all of these domains constantly exist, and proposes a language of health education governed by a pursuit of ‘responsive relational care’. Grown from seeds of health knowledge, practical experiences and reflexivity gathered during 18 years of personal health stewardship, 12 years of professional holistic health consultation and 8 years of mentorship in earth-stewardship, this research blooms from the consistently emergent question: What kind of health education can adequately inform, equip and inspire educators to enliven a regenerative culture of individual, social and environmental health stewardship with their diverse learning communities? This presentation will share the theoretical roots, rationale, novel curricular and pedagogical framework *Embodying Dignity*, hybrid methodology of compassionate embodied narrative inquiry and preliminary results from ongoing research with pre-service and in-service educators, representing a diversity of K-12 and higher education interests.

Embodying education for the 21st-century teacher: embodied cognition in theory and practice in teacher education and training

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In the past decades, there has been a significant development in embodied cognition theories supported by empirical research in diverse scientific fields, including education. However, expanding the notions of embodiment in teacher education and training is still a challenge. On the one hand, traditional cognitivist accounts of cognition remain predominant in teacher

education curricula and education research, dismissing the advancements in embodied cognition theories and their implications on education. On the other hand, the most common pedagogies in teacher training are still based on independent learning (self-study) and lecture or seminar models of teaching, which reinforce individual and brain-centric learning experiences. In this paper, we present an educational activity developed aiming to address this challenge: the course *Embodying Education for the 21st Century Teacher*, which was funded by the Programme Education Innovation - Brunel University London and Tampere University Partnership (2022-2023) and implemented at both universities. This five-credit course addressed the theoretical tenets of embodied cognition theories implicated in understanding cognitive processes related to learning while adopting an embodied approach to teaching. In this paper, we particularly discuss the reasoning for choosing the theoretical contents and the strategies to embody this conceptual learning in the context of teacher education and training in higher education in Finland and England. Furthermore, we present the qualitative assessment of the course, including students' perceptions of the learning experience and a micro-analysis of learning processes. The overall results show how embodying conceptual learning supported teacher-students in understanding the theory and deep self-reflection about how learning can be bodily experienced. The discussion addresses the potential and limitations of our embodied approach, offering insights on how to elaborate on and develop future teaching/learning practices.

Keywords: Embodied learning, teacher education, embodied cognition

Embodying wellbeing in education: Cultivating wholeness and flourishing for all

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Professor Venka Simovska, Danish School of Education, Aarhus University, Copenhagen, Denmark

In recent years wellbeing has become a pillar of western educational discourse and practice. However, the current interest in wellbeing in education is not without contestation. One problem is that most contemporary theorising in the area of wellbeing draws heavily on traditional, monological and reductionist theories, which view the self as autonomous, self-contained and separable from the social and material world. This type of theorising inevitably leads to individualistic and de-contextualised wellbeing interventions in schools. A second problem is that the current wellbeing agenda in schools largely precludes consideration of the goals, purposes and transformative potential of education itself. In this article we tease out these concerns and propose a framework to support renewed thinking in the area of wellbeing and education. Specifically, we draw on the work instigated by Francesco Varela, which considers human cognitive and affective processes as enactive, embodied, embedded and extended. This radical paradigm acknowledging that we exist as situated, embodied beings profoundly entangled with the social and material environment. We then discuss this approach in light of the European educational concept of *Bildung*, in order to reclaim wellbeing as an educational goal in its own right. We seek to show that wellbeing and education are co-dependent and co-constitutive and together they afford rich possibilities for advancing mind-body-world connections. This presentation is based on a chapter published in *Wellbeing and Schooling: Cross Cultural and Cross Disciplinary Perspectives* (2022).

Emotional Colors: relationship between light wavelengths and educational settings for enhancing learning processes

Elèna Cipollone, Luna Lembo, Francesco Peluso Cassese University-Rome (IT)

The research project reconsiders and redefines the educational setting for individual students in order to create optimal learning conditions by harnessing the potential of the luminous stimuli present in the classroom atmosphere. Literature has highlighted how the wavelength of different colors is associated with varying levels of engagement and attention in children, as it is linked to different emotions experienced upon seeing the colored stimulus (Ram, 2021; Gunes, 2020; Kramer et al., 2019; Vandewalle et al., 2017; Chellappa et al., 2011). The objective is to outline the impact of colored stimuli on the learning processes of elementary school children, through the conscious use of red (700.47nm), green (546.09nm), and blue (435.79nm/460 nm), selected based on the strong sensitivity of human eye photoreceptors (Liu et al., 2021). The study is conducted under three conditions: (1) use of educational tools characterized by a color calibrated to the relationship between students' emotional processes and wavelength; (2) use of a luminous frequency (460nm), on a desk lamp, to benefit students' attentive functions; (3) synergistic integration of the previous conditions to evaluate the possibility of simultaneous or mutually exclusive use of the proposed stimuli. The study involved an initial phase of color-emotion association on an individual level, using the EMOJI software, capable of recognizing the subject's emotion through facial muscle contractions, during the viewing of colored stimuli. Subsequently, after customizing the educational setting, the Stroop test and the Visual Search Test were administered to assess attention processes, along with a specific questionnaire to verify the learning processes in the experimental condition. The potential of the project lies in its high practicality and personalization. The choice to offer individualized educational settings allows for tailoring the proposal based on the specificities and needs of each student, thus respecting the diversities within the class group and promoting inclusion.

Keywords: elementary children; blue; red; green; attention

Enactive attunement: Children attending to self and other during play with digital body metaphors

Minna O. Nygren, PhD, Research Fellow, UCL Interaction Centre. University College London (UCL)

Empirical research suggests that bonding between a parent and child is supported by embodied attunement; an early attending to the embodied expressions of each individual to the other (e.g., Trevarthen, 2001; Schaefer et al., 2008). A similar phenomenon can be found in body psychotherapy practice, where mirroring movement practices have been shown to support the development of social interaction (e.g., Tortora, 2006; Martin, 2014; Röricht et al., 2014). However, while attunement plays an important role in early bonding, its role beyond infancy is less understood. This talk will draw on four empirical studies with 35 young children (2-7 years) and three families interacting in groups with a digital purpose-designed whole body interaction environment with mirroring abstract body shapes and objects (e.g., Nygren and Price, 2020). Participant interactions, videorecorded during each experiential workshop, were analysed using a multimodal analytical approach (e.g., Nemirovsky et al., 2012) with a focus on joint attention, joint action (e.g., Gallagher, 2020) and verbal dialogue. The findings from this study demonstrate that during group interaction with digital body metaphors, children engage in forms of 'enactive

attunement' with other participants that emerge during moments of playful joint action, mimicry, creative ideation, and an attending to one's own and each other's interactive cause-and-effect capacities. Collectively, these instances can be seen to support children gaining experiences of 'positive intersubjectivity' (e.g., Trevarthen, 2005) during whole body interaction with mirroring body metaphors. The findings speak to the importance of understanding the role of 'enactive attunement' in group learning environments, and opportunities and challenges for sensorimotor interaction design.

Enactive hermeneutics, transparency and virtual reality in educational contexts

Shaun Gallagher

Lillian and Morrie Moss Chair of Excellence in Philosophy, University of Memphis

Gadamer's hermeneutical model of conversation shares common ground with enactive embodied approaches to intersubjective interaction. The principle is that something over and above the agents' intentions dynamically emerges in a process that has direct relevance to education. I look Gadamer's characterization of this process as involving play. I reference the use of virtual reality in educational contexts to see how Gadamer's principle plays out, and I then raise some questions about the nature of three types of transparency: experiential, epistemological and hermeneutical.

(En)action research: practice transformation through processes of participatory sense-making in educational action research

Ole Lund, Jens-Ole Jensen & Kasper Lasthein Madsen

Scholars regard educational action research as contributing to change and developing sustainable teaching practices. The theoretical framework revolves around the idea that changes stem from human actions and draws inspiration from several philosophical traditions. However, the dynamo of transformation in the different approaches is generally a systematic self-reflective inquiry (Cassell & Johnson, 2006). In this presentation, we examine how changes of practice through educational action research emerge when the process is understood through the enactive theory of participatory sense-making (De Jaegher & Di Paolo, 2007). The point of departure for our methodological examination is an action research project on Movement Integration in Danish primary and secondary schools (Madsen et al., 2020). Our analysis underscores that the process of dialogue and participation in action research gains impact by embracing joint movement-based actions. Our study highlights that pre-reflective and movement-based inquiries may be a significant dynamo in the action research project's effort to become deeply meaningful for the participants, to empower their participation and to make sustainable practice transformations possible (Madsen et al., 2023). Applying the enactive framework in action research brings forward a methodological awareness about unnoticed dimensions of how participants make sense of action research processes, and the significance of being attentive to and working actively with 1) relation-making, i.e. how participants participate in each other's sense-making by how they move in relation to each other; 2) time-making, i.e. how participants' past experiences and future possibilities interblend

with how they grasp a given matter; and 3) space-making, i.e. how sense-making is extended into space through the body's location and actions in a given environment.

The presentation is based on a published article (Madsen et al., 2023) and central points will be exemplified during the presentation by inviting the audience to participate in a practical and interactive activity.

KEYWORDS

Participatory sense-making; enactive cognition; movement-based inquiries; pre-reflection; educational action research

Enactive Movement Integration – a didactic model for embodied learning in primary and secondary schools

Kasper Lasthein Madsen, VIA University College

The workshop presents a didactic model for Enactive Movement Integration (EMI) containing six categories of bodily practices: to mime, dramatise, gesticulate, shape, imitate, and sense. The didactic model is informed by the theory of enactive cognition and developed through action research in Danish primary and secondary schools, where teachers and researchers collaboratively developed movement activities in teaching. The activities include, for example, pupils engaging in literature analysis by miming the characters or working with historical periods requiring pupils to become characters and partake in relations with other pupils, using a set of rules established to support specific features. Thus, the bodily practices yield impressions and experiences of a sensory-motor, affective, and intersubjective nature, which provide the opportunity to work with and process complex academic concepts. The didactic model helps teachers plan and conduct Movement Integration in classroom teaching in a way that embraces the pupils' embodied subjectivity and enactive engagement with the subject matter. The workshop comprises a theoretical introduction to EMI and practical examples of body practices as teaching activities of the subject matter.

Energy Theater as an example of embodied physics teaching

Jesper Haglund¹ and Fredrik Jeppsson²

Energy Theater has been developed by Rachel Scherr and colleagues at Seattle Pacific University (Daane et al., 2014; Scherr et al., 2013). It provides an embodied approach to physics education, in which groups of participants choreograph and jointly enact energy transfer and transformations involved in different physical scenarios, such as a bouncing ball (see Figure 1). Each participant represents a unit of energy, forms of energy are symbolised by different gestures that the participants come to agree on, and the energy flow from object to object is enacted by participants' movement between rings of rope on the floor. The physical constraint that there is a fixed number of participants means that energy conservation is built into the rules. Energy Theater has been brought forward as an example of physics teaching that involves an interactionist sense of embodiment (Kersting et al., 2021). We have found Energy Theater a valuable tool in the teaching of energy both in primary school teacher education (Andersson & Haglund, 2018) and in preschool teacher education (Jeppsson & Frejd, 2018) in Sweden. In the workshop, we introduce Energy Theater as a practical example of embodied physics teaching by inviting participants to enact different physical scenarios, and discuss how the approach may foster learning of physics.

Everything flowed like a small mountain river. A European research project on dance and school innovation

Veronica Berni, Nicoletta Ferri, Giulia Schiavone, Department of Human Sciences for Education “Riccardo Massa”, University of Milano-Bicocca

How can choreographic language be valuable for the school system in the contemporary world?

This paper intends to discuss frameworks, process aspects and outcomes of the European project Media Dance Plus, developed between Italy and France, and addressed to students and teachers of two secondary schools. Born from the scientific collaboration between the Department of Human Sciences for Education “R. Massa” (University of Milano-Bicocca) and the Fondazione Piemonte dal Vivo, the project aimed at experimenting and promoting, through choreographic artist residencies, reflections and innovative practices in the encounter between the world of school and performative languages.

Focus of the project was the enhancement, in school contexts, of the embodied dimension and the performing arts as languages aimed at promoting the development of creative potential and a performative, expressive and embodied relationship with knowledge (Leonard, 2012; Gamelli and Mirabelli, 2019; Antonacci and Schiavone, 2021; Ferri, 2022).

Two choreographers specialized in processes of didactic innovation through dance have worked with teachers and students. Teachers were specifically involved in a training sensitive to the mind-body relationship in learning-teaching process. At the same time, an immersive choreographic training was addressed to students, through participative and engaging methodologies.

Starting from a literature review on the role of artistic residencies in school contexts, the reading and data analysis were based on the theoretical framework of the *Una scuola* Manifesto (Antonacci and Guerra, 2018) and highlighted the impact that the performing arts can have on the school system, in terms of didactic innovation (Lee, 2013; Ruppin, 2015; Filiod, 2018).

For this purpose, the contribution intends to share the multiple voices and multiple views of the actors involved, highlighting how the encounter with performance languages triggers the embodied approach to the transformative potential of the aesthetic dimension, understood as an experience of connection and mutual recognition.

Keywords: Embodied Education; School innovation; Artist-in-residence; Dance; Performative languages.

Experiencing sense of agency in educational contexts – the case of health care professionals

Søren Engelsen

This presentation explores the normative significance of the sense of agency in educational contexts. It focuses more specifically on the connection between the sense of agency and everyday experiences as a health professional in contexts of learning at work, drawing on empirical evidence from focus group interviews with mid-level educated health professionals in various departments and sectors (e.g., medicine, psychiatry, surgery) in Denmark, observational studies, and phenomenological analysis and theory.

Sense of agency is not merely the possibility of actualizing personal goals but the *fundamental embodied experience of being an active agent* in one's life, a life force, influencing the surroundings and contributing meaningfully. In the present context, it closely links to moods and emotions in connection with the social environments involved in formative educational processes.

The study examines how the sense of agency is experienced as a normatively crucial value and can be a dominating motivator and meaning-generating factor in the workday and practical education of health professionals. In healthcare work, the sense of agency aligns closely with health professionals' tasks, emphasizing its experienced non-instrumental value and its requirement for personal growth.

Sense of agency and its normative significance take different forms. The presentation illustrates the experienced significance of professional agency in handling crucial tasks, emphasizing the significance of contributing to patient care, desires for psychological safety and managing fallibility in healthcare practices. Further, the data underscore how the sense of agency is intimately tied to participation in a recognition community and the importance of basic professional curiosity, continuous development, reflecting a desire for personal growth and staying in touch with relevant new knowledge and its practical application. Another recurrent theme is the existential need to 'see oneself' in the work, identifying oneself with one's work life.

Exploring Perspectives on Embodied Learning: Insights from Prospective Math Teachers

Emre CUMALI, Damla CUMALI

This study explores the attitudes and perceptions of fourth-year prospective teachers from an education faculty regarding embodied learning in mathematics education. Embodied learning, which integrates physical activity and body with cognitive processes, is examined for its potential impact and practicality in the classroom setting. Through qualitative interviews with 30 participants, this research aims to provide insights into how future educators perceive the implementation of this innovative teaching approach.

The study utilized semi-structured interviews to delve into the participants' understanding, experiences, and perspectives on embodied learning. These interviews were transcribed and analyzed using thematic analysis, focusing on identifying prevailing attitudes and concerns among these near-graduate prospective teachers.

Our preliminary findings reveal a positive outlook on the benefits of embodied learning. The majority of participants believe that this approach can significantly enhance class participation, motivation, and cooperation among students. They emphasize the potential of embodied learning to make abstract mathematical concepts more accessible and engaging, thereby fostering a dynamic and inclusive learning environment.

Despite these perceived benefits, several challenges were identified. Participants expressed concerns about classroom management difficulties when applying embodied learning strategies, especially in maintaining student focus during physically active lessons. Furthermore, the efficacy of embodied learning in larger classes was questioned, with some participants noting potential reductions in individual attention and overall efficiency. Participants noted that the dense current curriculum may hinder the integration of embodied

learning methods, suggesting the need for curriculum modifications to support these pedagogical innovations.

These findings suggest that while embodied learning is viewed favorably by prospective teachers for its potential to enrich mathematics education, there are significant challenges to its implementation. This study underscores the necessity for teacher education programs to address these challenges and prepare future educators for practical and effective use of innovative teaching strategies like embodied learning.

Exploring Spaces and Embodied Responses in Encounter with the Otherness: A Study of Experiences of Young Participants in International Volunteering

Stefania Moser (Free University of Bozen-Bolzano)

Cinzia Zadra (Free University of Bozen-Bolzano)

Keywords: Embodied Global Education, Phenomenological Vignettes, International Volunteering, Encounters with the Otherness

Several studies (Francesconi & Tarozzi, 2019; Gallagher & Zahavi, 2020) have emphasised the importance of the lived body in learning processes. Furthermore, sensory experience is crucial in the transformative processes of 'global belonging' (Le Bourdon, 2021) and relevant to the mobilisation processes of Global Citizenship Education (GCE) (Faggioli, 2023). Embodied Education provides an educational approach that can meaningfully align with GCE, particularly if, according to Biesta (2021), education is seen as a call from the world to the responsibility of the subject. This call can arise from unique events that deviate from the norm, causing an "interruption" (Biesta, 2015, p.36) prompting the search for new responses (Waldenfelds, 2011).

This proposal presents some results from a qualitative research analysis conducted within a non-formal learning context in the field of international volunteering. The data were collected using the instrument of phenomenological vignettes (Schratz et al., 2012). This qualitative research tool captures moments of experience in written form, drawing from Husserl's descriptive phenomenology (1980) and Merleau-Ponty's body phenomenology (1962). Through concise narratives and dense descriptions of these experiences (Schratz et al., 2012), the vignettes not only emphasise linguistic expressions, but also highlight the co-experienced atmosphere. Consequently, they not only reveal shared experiences with participants, but also make them (re)perceivable, sensitising readers to physical articulations and bodily experiences in a (theoretically) reflexive manner.

Examples of vignettes and related analyses will be presented to illustrate how the young volunteers experience embodied encounters of interruption. They immerse themselves in the physical and symbolic space of the Other, providing unprecedented responses to a 'foreign' call (Waldenfelds, 2011) related to learning processes of Global Education.

Exploring students' embodied engagement in physics teaching through diverse analytical lenses

Fredrik Jeppsson, Kristina Danielsson, Jesper Haglund and Magdalena Kersting

In science education research, there is a growing body of studies focusing on the role of embodied experiences and multiple representations in pupils' learning. In this study, we present findings from a re-analysis of data using different theoretical and methodological approaches drawn from embodied cognition and social semiotics. Specifically, we have re-analysed video data that involves one teacher's work with Newton's third law (force and reaction force) in grade five (11 – 12 years) with 27 students (Danielsson, Jeppsson, Nestlog & Tang, 2023). The analysis is carried out at a clause level as the minimal unit of analysis, with embodied gestural and material manipulation accompanying the verbal transcription. To further broaden our scope, we incorporated various analytical strategies from embodied cognition (e.g., Kersting, Haglund & Steier, 2021), the social semiotic theory of multimodality (e.g., Kress, 2011), and force dynamics in language and cognition (Talmy, 1998) to explore students' embodied engagement with the studied phenomenon from different lenses. Based on our analysis we problematize and discuss consequences for science education research and practice when video data from a science classroom is processed from different theoretical and methodological perspectives.

Extended body: the use of social media among pre-teens and its body-related consequences. An exploratory study.

Simone Digennaro, University of Cassino and Southern Lazio, Department of Human Sciences, Society and Health

Pre-teens (10-12 years) are prolific media users, yet it is unclear whether the different types of social media engagement are impacting their body image and well-being. This exploratory study aimed to test a model of relationships between types of social media engagement, attitude to alter one's physical appearance, and body satisfaction. A sample of 2378 Italian preadolescents (Mage= 12.02 years; SD= 0.82; 52.81% boys) was recruited. The statistical analysis indicated an excellent model fit. The scaled chi-square was $\chi^2(31) = 233.57$ ($p < 0.001$, CFI= 0.92, SRMR= 0.06). The model had an acceptable fit based on the obtained RMSEA point estimation (=0.11) and the 90% confidence interval (=0.10, 0.12). Results showed that the use of filters/apps to alter one's physical appearance along with an image-mediated interaction with peers and celebrities/influencers is negatively associated with body satisfaction. It also represents the ground for the emergence of a new form of dualism between the real and the virtual body, as effect of the changes that, today, are impacting the society. The integration of technology and virtual spaces into our lives is blurring the boundaries between the digital and physical worlds with profound implications on various aspects, including perception, reality, and interactions. The younger generations, deeply immersed in this reality, experience a transformation in their perception of the world, well-being, identity, and selfhood due to technology's pervasive influence. The fusion of online and offline experiences gives rise to a new form of existence, shaping a hybrid identity that can be manipulated and reconstructed in the virtual realm. However, this fluidity and transience of virtual life also pose risks and challenges to personal identity and societal ruptures. Educators face the dual challenge of effectively integrating technology into education while understanding its impact on the new generations; technology is

challenging traditional notions of embodiment and raising questions about the malleability and multiplicity of identities in technologically mediated spaces.

Five faces of Embodied Education

Filippo Gomez Paloma – University of Macerata, Italy (Chair/Discussant)

Paola Damiani – University of Modena e Reggio Emilia, Italy

Christina Krause – University of Graz, Austria

Francesco Peluso Cassese – University Pegaso Net, Roma, Italy

Antonio Borgogni – University of Bergamo, Italy

The scientific and pedagogical advancements in the field of learning have shed new light on cognitive processes and their impact on education. Various disciplines such as neuroscience, psychology, and philosophy have contributed to this interdisciplinary exploration. As we move away from the traditional Cartesian view, the body has gained a different meaning and newfound scientific value, serving as a cognitive and relational tool with significant holistic and anthropological implications. With this in mind, our working group aims to present a round table discussion on the topic of Embodiment, focusing on its scientific and cultural influence in the fields of education and social sciences. We will examine the neuro-phenomenological mechanisms that justify the importance of the body in learning and educational relationships (Research), explore the societal and ethical value of the body, particularly in relation to urban sustainability and well-being (Culture), showcase interactive and multisensory learning environments based on the principles of Embodied Cognition (Experimentation), and analyze the pedagogical implications of this theory in educational settings (Didactics). Finally, we will propose an innovative approach to teacher training that embraces Embodied Cognition (Training), demonstrating the wide-ranging application of the Embodiment phenomenon in the socio-educational and scholastic contexts.

Investigate professional gestures in educational work. A research-action with a group of professional educators

Alessia Tabacchi, Università Cattolica del Sacro Cuore – Milan

A particular expression of corporeality in educational work is represented by non-verbal language. Literature, particularly in the francophone field (Jorro, 1998, 2016; Bucheton & Dezutter, 2008; Alin, 2010; Giglio & Perret-Clermont, 2012), examined professional gestures with reference to the work of teachers. Since it educates through its actions and its communicative and relational style (Pati, 1984; Gamelli, 2005; Cadei, 2017), it is believed that lingering on gestures and professional posture (Lamuel, 2016) can increase the meta-reflectivity on the practice and educational cultures, with enrichments in the topic of professional ethics (Cadei et al., 2022).

The contribution aims to present an action-research aimed at investigating the professional gestures by a group of educators working within public Childcare Facilities (complementary to

school time) for children aged 6 to 11 years. It is proposed to highlight, on the one hand, the underlying intentionality and knowledge (Le Bellu et al., 2010) that guide the action, and on the other hand, the impact of these gestures within the wider educational process.

Empirical research intertwines the design plan that precedes the practice, foreseeing a first phase of reflexivity (Dewey, 1933) in and on action (Schön, 1983), followed by a moment of auto-observation (Postic, De Ketele, 1988) through an autovideography (Butson & Thomson, 2011) of a juncture of educational activity. In a second phase, there will be an explicitation interview (Vermersch, 1994) with the individual educator, on the theme of professional gestures in the context of videotaped educational activity. The gestures emerging from the observation implement a repertoire of educational gestures that are further themed within the individual work teams (Kemmis & Hopwood, 2022) and the wider community of practice (Wenger, 1998).

In this way, it is possible to outline the professional gestures proper to the work of the educators in the Childcare Facilities and their specific functions in relation to interweaving between embodiment and education.

Facilitating Early Mathematics Learning Through Finger-Based Strategies – An Intervention Study

Authors: Venera Gashaj^a, Mirjam I. Frey^b, Hans-Christoph Nuerk^{c,d}, Korbinian Moeller

There is an ongoing debate on the role of finger use in early mathematics instruction. While considerable correlational evidence suggests positive effects of finger use on early mathematical learning, evidence allowing for causal inferences is scarce. We ran a pre-post-follow-up intervention study to investigate the impact of finger-based strategies on arithmetic learning. In a year-long program integrated into standard mathematics instruction in first-grade (mean age 6.48 years, SD = 0.35), we compared a finger-based training group (n=119) with a control group (n=123) following the conventional curriculum. Propensity score matching was used to ensure comparability of groups at the pretest on relevant covariates (e.g., precursor skills, general cognitive ability, etc.).

A mixed measures ANOVA demonstrated significant differential learning trajectories across measurement time-points between groups. In particular, children completing the finger-based training consistently outperformed the control group in written addition and subtraction at the end of first grade and maintained their advantage in a follow-up test nine months later in second grade. For addition, the finger-training group exhibited a significantly stronger performance gain from pre- to post-test compared to the control group, with advantages persisting through the follow-up test. Similarly, for subtraction, the intervention group outperformed the control group. Intriguingly, there was no training effect for number line estimation tasks supported by Bayesian analysis.

Taken together, our findings provide first causal evidence suggesting beneficial effects of finger-based strategies in primary school mathematics education, offering empirical support for the idea of an embodied representation of numbers. This research contributes to the broader discourse on embodiment in education by allowing causal interpretations of the positive impact of embodied strategies on early mathematics learning, fostering an interdisciplinary dialogue at the intersection of cognitive science and pedagogy.

Feeling with the Body. An Enactive Approach to Social-Emotional Learning through Cooperative Games in Teacher Education

By Malusa Giovanni

Recent studies advocate for promoting educational experiences that enable individuals to become aware of their lived experiences and assign a central role to the "felt" integration of bodily experience, also definable as "embodied educational practice".

In particular, the Findhorn cooperative games integrate bodily, relational, metacognitive, and metaphorical dimensions, enabling the playful and embodied experience of the encounter with oneself and other to be reprocessed, engaging ever-deeper inner levels, which are crucial for self-development.

But what awareness and social-emotional skills do trainee teachers develop through one or more sessions of cooperative games, involving the body and non-verbal communication?

This paper introduces a qualitative case study, drawing from empirical data collected during a training module focused on cooperative games within the indirect internship component of the Primary Education Master's program. The course has been conducted annually from 2021 to 2023 at the Free University of Bozen (Italy) and has involved 157 second-year students. According to the Experiential Learning Model and the holistic approach of the *Findhorn Foundation*, each of the 8 workshops included games designed to promote awareness, exploration, and trust. The debriefing sessions were conducted through Circle Time, pairs/small group debates, and a final questionnaire.

All the data (narratives, debriefings' post-its, photos) were transcribed into textual form. Subsequently, they were systematically coded in accordance with Grounded Theory procedures to emphasize recurring codes, establish categories, and uncover emerging themes. The main categories relating to social-emotional learning which emerged from the data will be shown, namely bodily consciousness, relational well-being, discovering self-other, opening up to diversity.

Finally, the educational relevance of cooperative games within a holistic approach for promoting socio-emotional skills in initial teacher education will be discussed.

KEYWORDS: Initial teacher education; social-emotional skills; experiential learning; cooperative games; embodied education.

Feldenkrais Method in Teacher Education.

Orit Schwartz-Franco

Feldenkrais Method is largely known to improve movement and to treat or prevent pain. Beyond these goals, the method enhances self-awareness and supports learning processes; it revitalizes organic learning, which is both individual and holistic (Feldenkrais, M. 2011). Based on this interpretation of Feldenkrais (Author, 2001) and other philosophical foundations of the concept of embodied learning (Merleau-Ponty, M., & Smith, C. 1962; Author, 2016) I have developed a course, which is taught in teacher-education colleges for k-12 educators in all subject matters. In each session of the course, we experience a movement-lesson, and then reflect on it individually and in a group discussion, reaching insights concerning human learning, that are later "translated" into teaching methods in a regular class, in all subjects. Some of the issues discussed in group reflections are for example: Self-assessment of students' progress, individual learning in a group lesson, learners' choice within defined frameworks, the role of imagination in learning, emotional aspects of learning, etc.

The growing interest of teacher-educators in SEL (social-emotional-learning) (Donahue-Keegan et.al. 2019), and their exposure to practices of mindfulness in education (Ergas, O., & Ragoonaden, K. 2020) have brought the workshop closer to the consensus of what teacher-students can benefit from, and should experience, to become better teachers.

In the conference workshop I propose a short movement lesson followed by a group discussion about the theoretical essence and pedagogical implications of the method. [The workshop would preferably be placed in a spacious room with mattresses, but can be practiced also while sitting on chairs, in a regular classroom]

Fostering a synergy between the development of well-being and musicianship through a movement-based approach to instrumental music learning and teaching

Luc Nijs

In this 'from theory to practice' presentation, the role of the body in instrumental music education is (re)considered in view of fostering a synergy between the development of well-being and musicianship.

I plead for a "caring" stance towards instrumental music education, conceiving of the development of well-being as an intrinsic element of the development of musicianship. First, I define such a caring stance, conceiving of musical development and the development of well-being as the two chains of the DNA of music education, with the PERMA building blocks of well-being (Seligman, 2011) as the bases of the ladder that connects the two chains. Next, I discuss how a synergy between the development of musicianship and well-being can be achieved by a constraints-led approach (e.g., Renshaw & Chow, 2019), aiming at integrating these building blocks of well-being into the dynamics of a music lesson. Then, I present a novel approach to instrumental music education that seeks to achieve this synergy by educating the performing body beyond a mere instrumentalist approach to body and musical instrument through the incorporation of movement-based learning activities (Nijs, 2019). After elaborating on the guiding principles of this "kinemusical" approach, I exemplify the presented framework by discussing learning activities in relation to the constraints-led integration of the PERMA building blocks of well-being.

From the mechanization of educational act to embodied knowledge : a path of awareness

Maria Livia Alga, Post-doc researcher in Social Pedagogy, University of Verona
Teresa Brenzoni, Social educator, dance theatre expert

The bureaucratization of action in educational institutions (Graeber 2012) and the constant struggle to move within rules and approvals lead social workers to a tiredness that gradually corrodes creativity, exhausting the strength of the gestures and presence in everyday life. Still bodies and reactive minds work tirelessly to find strategies and solutions, so as not to succumb to the machine of the system.

This workshop is based on the concept of demechanization (Boal 1993), understood as dissolving the "social mask" of educators. For this purpose Boal elaborated game-exercises that work on three levels of oppression (bodily, psychological and socio-political) in order to alter the habits that ritualize and mechanize our movements, sensitivity and cognitive abilities, determining rigid physical and mental routines.

We propose that workshop participants experiment with decomposition and inversion of motor patterns through short exercises (10 min.) of dissociation of body parts and demechanized breathing. We then ask the group to participate in an exercise (15 min.) that questions the relationship between the imaginaries of educational spaces and body postures. During the conclusions (10 min) the group will be invited to reflect on what demechanization of educational work means on the three levels of oppression named by Boal.

Creating connections between sensory perceptions, gestures and acts of representation and processing calls into question the inseparable relationship between cognitive abilities, feeling and bodily skills (Gallagher 2023). It is about awakening a form of embodied knowledge that takes into consideration the whole of the self and not the mind/body subsystems in order to promote an emancipatory education.

Genesis of the gaze

Nazario Zambaldi

As the great director Peter Brook declared, cognitive neuroscience has come to discover what has been known for artists and thespians all along, in practice. Between the visible and invisible, inter- and intra-subjectivity, movement and action are opportunities to experience presence: phenomenological consciousness as gaze. The workshop fits as a partial creative synthesis - exemplary - in a multi-year journey in theater and art, as well as in the PhD research “Embodied Education through art and theater”. The direction of the research has been indicated in 2021 in the talk entitled “Polis: Arts-Based Research in Education” at the END Education New Developments conference (<https://end-educationconference.org/2021/special-talk/>) by reviewing the workshops held since 2000 using the arts as a tool for creative conflict management, in particular in creating community through the relational use of visual arts and theatre, as well as work in primary and secondary schools, theatre work in psychiatry (2004-2013) and in asylum seeker centres (2015-2019). This personal research - initiated in theater with master Jurij Alschitz - continues in teaching, artistic and theatrical production and had an important realization in the involvement of the community and local institutions, museums, associations and universities in 2018 in collaboration with Cittadellarte and Michelangelo Pistoletto and in 2020 in the exhibition and projects dedicated to Bruno Munari, as well as in recent work with Peter Brook’s collaborator Mamadou Dioume. The most recent synthesis of this research is the conference PEA - Pedagogy Ecology and the Arts (www.peaconference.org), which in its first edition in 2023 entitled “polis” linked the ecological dimension, that is, the mind-body-environment system, the arts and pedagogy. The workshop aims to highlight how the biopolitical dimension of change is expressed from embodied experience and how this occurs naturally through the visual and kinesic channels opened in a symbolic metaphorical dimension by the arts through the body.

Heuristic and didactic metaphors in chemistry education: A systematic review

Charlotte Müller and Martina Rau

Chemistry education research focuses to a large part on the question of how we make sense of imperceptible concepts. How can we understand a phenomenon that is not experientable? The research program embodied cognition argues that all concepts are grounded in (mapped to) personally meaningful experiences (Shapiro, 2019) and that therefore, grounding is a crucial mechanism that should be considered and supported in the classroom (Nathan, 2022). Stated differently, concepts are understood via metaphors that map their characteristics to ones of a

familiar source domain. Niebert and colleagues argued that many science-specific misconceptions originate in a mismatching between such a source and target domain (Niebert et al., 2012). They suggest that the difference between metaphors employed by novices and experts may inform the design of representations that support the transition from the former to the latter. This warrants a detailed understanding of metaphors present in chemistry-specific terminology as well as chemistry teaching generally. We are building on the following reviews. First, Amin (2015) reviewed the connections of conceptual metaphor research and conceptual change research, providing insights into future directions and implications for practice. He thereby situated metaphor research more centrally within the realm of educational science. Recently, Amin has further reviewed metaphor research targeting the concept Energy (Amin, 2020). Finally, Barrios (2021) conducted a hermeneutic literature review on metaphor research targeting STEM and STEM education. He provides a broad overview of studies targeting conceptual metaphors, excellently capturing historical and recent significant studies. However, due to the broad focus, Barrios' review does not examine the designs, strengths, and weaknesses of these studies in detail. We present a focused systematic review of chemistry-specific interventions, discussing designs, types of metaphors (heuristic metaphors inherent to the domain versus didactic metaphors designed for educational purposes) and implications for chemistry education (Moher et al., 2009).

Improving Relational Reasoning Skills through Embodiment

Menno van Calcar

Reasoning in general seems to be a thoroughly intracranial skill, and deductive reasoning in particular seems to be prototypical disembodied processing of amodal symbols. Teaching this skill is therefore typically seen, and approached as brain training. I argue that deduction *has* embodied roots, and that tapping into these roots improves teaching practices. By conceptualizing linguistically presented premises and conclusions as *affordances* (for action. Kiverstein & Rietveld, 2021), we come to understand that premises are something with which we can *do* something. I use behavioral findings that show that people actually use spatial and motoric pathways to tackle deductive tasks, and neurological data that show that the neural substrate of deductive reasoning is the same that we use for finding our way through a three-dimensional world. I argue that our reasoning skills are realized by *exapting* cortical structures that were developed for dealing with a spatial world, and that the older function of these structures still shape our reasoning processes (Anderson, 2010). Therefore people primarily use *spatial layouts* (Knauff, 2013), even if they also visualize, and also report on using syntactical processing. Psychological experiments have demonstrated that we simply do not follow logical rules (Stenning & van Lambalgen, 2008), and visualization actually *impedes* reasoning performance (Knauff, 2009). That suggests that bypassing logical rules and visualization, will enhance reasoning skill: reasoners who, as directly as possible, use spatial relations in reasoning tasks, will do better than those who are distracted or detoured. I devised a tool to test this hypothesis in relational reasoning: motor-engaging spatial layout tokens. In a pilot I ran, the hypothesis was corroborated, and a full test (120 test subjects expected) is planned for January 9th, 2024. In this workshop, participants will become test subjects, and will tackle relational reasoning tasks by handling physical tokens.

Material Engagement Shaping Participation of Children on the Autism Spectrum: Embodiment and Subjectivity in Small-group Learning

Juliene Madureira Ferreira, Assistant professor, Faculty of Education and Culture
Tampere University, Finland

Luciana Soares Muniz , Professor, Teacher Education and Training School
University of Uberlândia, Uberlândia, Brazil

This study investigated the material engagement and their affordances for participation of children on the autism spectrum (AS) in small-group learning. Framed by a methodology called *Idea Diary* that fosters social interactions in classroom environments, our focus was on understanding how and when the construction and manipulation of the diary supported children's participation and knowledge construction in small groups. We present two case studies of 9-10-year-old boys. Data consists of the diaries produced and used by children and video recordings of children's interactions during small-group discussions. Our analytical approach included a qualitative semiotic analysis of the materials and a micro-analysis of the social interactions. The results showed, first, that children on the AS continuously engaged in the construction of the diary, expressing elements of their subjectivity— experiences, ideas and the system through which they interact with the world. Repetition framed children's productions and signalled engagement. Second, material engagement enabled participatory sense-making, which in this study appeared in creating new communicative resources between the child on the AS and their peers and in adapting the narratives, approximating children's perspectives in conversations. Although contextualised within a specific pedagogical practice, the study contributes to advancing our understanding of the role of material engagement in social participation in learning situations involving children on the AS, particularly relevant in educational psychology and education. Enactive approaches can improve research and practice in autism research, contributing to advancements in understanding learning processes.

Keywords: *Materiality, Embodiment, Participatory sense-making, Autism research, Embodied pedagogies, Participation.*

Mindful Movers: An investigation of Laban/Bartenieff Movement Studies for instrumental music education

Dario Cottica

Somatic practices constitute a broad field of embodied contemplative disciplines that cultivate the experience of bringing awareness to the living body in action (Eddy, 2009). They developed in order to address physical problems that impact health or hinder artistic performance. The Laban/Bartenieff Movement Studies (LBMS) are one specific somatic practice that provides a particularly rich framework to experience and understand human movement. Despite a history of successes, somatic practices still stand on the fringes of most educational and healthcare systems. These disciplines are in fact highly under-researched, and an in-depth scientific description of the cognitive processes underlying their expertise is still lacking. However, recent developments in the pragmatics of phenomenological inquiry offer an effective way to bridge the gap between the world of somatic practices and cognitive science. This study aims at exploring the experience of somatic practitioners by conducting semi-structured, ethnographically-inspired phenomenological interviews (Høffding & Martiny, 2016; Ravn & Høffding, 2017) with a purposeful sample of certified LBMS experts. The interviews are contextualized and informed by participant observation performed within LBMS training sessions, transcribed, and coded. Concurrently, phenomenological concepts and enactive accounts of cognition (Gallagher &

Zahavi, 2021) are used to interpret the experts' first-person reports. This study translates the unique language of a somatic practice such as LBMS into the more comprehensive terms of contemporary cognitive science. This theoretical demystification can foster new research on the nature of these disciplines and help introduce them into more accessible programs in performing arts education. A phenomenological investigation of LBMS embodied expertise has the power to innovate pedagogy and reshape outdated training paradigms, anchoring movement practice in an integrated view of the individual. This is especially vital in the musical field, where the inadequacies of much instrumental music education and the staggering incidence of musculoskeletal disorders greatly compromise musicians' careers and health (Kenny, 2012).

Keywords: Instrumental music education, movement, performing arts, phenomenology, Somatics

Multisensory-Learning-Environments: artificial intelligence for the domotisation and replication of lights and sounds that foster the state of Flow

Stefania Morsanuto, Pegaso University

Chierichetti Claudia, Niccolò Cusano University

This contribution aims to create a potential synergy among human, artificial intelligence and the environment. The objective is to leverage the home automation of multisensory environments through the use of artificial intelligence software (Okagbue et al., 2023), in order to provide a multisensory learning context characterized by customization and calibration in delivering specific stimuli, particularly luminous and auditory stimuli (Alkotzei et al., 2017; Chen et al., 2022). These stimuli aim to enable the individual to undergo a neurosensory and embodied experience that facilitates the achievement of the Flow state that plays a crucial role in learning processes (Wang et al., 2020). In this complex process, personality traits, the sense of immersion in experiences, and behavioral processes interact with the environment, shaping the experiences of information acquisition and determining their characteristics in knowledge assimilation (Tian et al., 2021). The results related to the physiological activation state, attention levels, and brain activation of the individual, emerging from each experience, will be an integral part of the AI software training. This is intended to obtain personalized and calibrated intervention protocols, tailored to the specificity of the users on each occasion. Training this pioneering software involves a meticulous process in which the system learns to interpret and respond to a wide range of sensory stimuli.

Machine Learning algorithms have been implemented within the application to process data and create core sets related to the categories of interest. The integration of a conversational AI agent allows the generation of customized reports based on specific skills, taking into account the different professional profiles of the operators and the areas of intervention. The experimentation will take place during four educational days in March at a gymnasium school.

Music and inclusion: the embodied approach in the European ALIISA project

Ester Giamberini

The musical experience thanks to the expressive force of its multiple and primary language has become increasingly central in today's complex society to promote our being embodied and engaged in the world. Today music education, playing a central role in the development of the person, identity and ability to enter relationship with the Other, is called to face a challenge: translate the principles of active participation and democracy into concrete and inclusive musical educational practices. Émile Jacques-Dalcroze had already intuited and theorized with the eurythmy model how the body is central in the musical experience, the place-laboratory where music takes shape and meaning through movement, encouraging the construction of an important inclusive setting in which to enhance the specificity and potential of each. During the 20th century, other educational-theoretical theories and models associated the characteristics of music education with an embodied approach, culminating in the model of Embodied Music Cognition (EMC), according to which musical cognition is strongly determined by body-mediated interactions with music - cognition in interaction. The enhancement through the art of corporeality as a learning environment to build a research network that promotes the dissemination of good practices of inclusive artistic pedagogy was explored and put into practice by the European project ALIISA (2020-23), which set itself the goal «the development of inclusive art pedagogy». At the heart of the various projects implemented by ALIISA partners is the principle of inclusion in action: the artistic gesture as a privileged tool in the creation of a caring relationship with oneself and with others. The speech aims to carry out a critical analysis and a first interpretation of what is addressed by this project and to relate the analysis made with the Italian landscape of embodied music education on this issue.

New Work on the Critical Thinking Dispositions

Henri Pettersson

My presentation will illustrate what the embodied education approach can entail when applied to the topic of critical thinking. According to the received understanding of this epistemological phenomenon (e.g. Facione, 1990; Siegel, 1988), critical thinking is an aggregate of two mutually supporting components. The first main component brings together the epistemic and logical skills needed to assess the quality of evidence and the validity of arguments. The second main component is a constellation of intellectual attitudes, mental dispositions and epistemic virtues, which guide and define the normatively proper use of the aforementioned skills. In this form, critical thinking is one of the most widely accepted educational objectives of our time.

Over the past five decades, the development of the theoretical basis of critical thinking has mainly been the purview of representatives of the so-called analytical philosophy of education. They have used in their work the methodological tools that dominated general analytic philosophy of that era: the conceptual analysis of the core epistemic notions and the clarification of logical principles have been central target of focus (Glock, 2008). These non-empirical methodological emphases are particularly evident in the treatment of critical thinking skills. At the same time, the theoretical basis for the dispositions and attitudes of critical thinking has fallen by the wayside, as theorists in the field have themselves acknowledged (e.g. Siegel, 2010).

In my presentation, I will draw attention to how the abstract and disembodied way of talking about “epistemic agents” in analytic philosophy of education leads to this predicament. The human challenges and flaws in our thinking to which critical thinking dispositions are formulated as antidotes are deeply psychological in their origins. Thus, we can advance our understanding of the subject by identifying how empirical psychology and cognitive science

research describes these phenomena within the research program known as heuristics-and-biases (Gilovich et al., 2002).

Performing the body. Learning Italian traditional dances in the third millennium

Simona D'Agostino – *PhD Student* - University of Rome Tor Vergata

In the ethnomusicological and ethnochoreological landscape of Southern Italy there are traditional contexts that are still extremely vital today, whose practices are perpetuated through different expressions of the body.

The methods of transmission are multiple: from the one-to-one relationship to the one-to-many relationship, the dynamics of learning through imitation can take on forms that range from observation of the master dancer in his direct practice, to active participation in the context collective of a ritual practice, to the sharing and reproduction of performance segments on online audiovisual platforms.

Among the research I have carried out and presented here there is direct learning in traditional dance workshops, such as the *tarantella*, taught by expert practitioners who configure the typology according to the territorial and cultural contexts.

A second modality is represented by the transmission of forms and models of musical and dance expressions - such as *contraddanza* or *tarantella* - during family or religious celebrations in which the learning process through observation and imitation constitutes an apprenticeship extended over the time for progressive improvement.

Finally, there is a further and innovative context of individual expression and learning of traditional practices acted out and enjoyed through short videos spread especially among the younger generations: on Tiktok, for example, there are music videos that document individual and collective performances of traditional music and dances, and which are identified by hashtags and other forms of tagging.

The overview proposed here intends to offer an example of how traditional musical and dance practices are actively transmitted and shared still in the third millennium, both in the more "traditional" live interactions and in online communication and learning environments where the replication of different dynamic forms typical of the "real spaces" of the ritual.

Polyadic care in early years education

Ditte Alexandra Winther-Lindqvist, DPU, Aarhus University and Jennifer Duncan-Bendix

In this presentation we suggest a conceptualisation of caring for a group of children as relevant for the ECEC setting. We call it polyadic caring. Caring for the whole group of children and how it is achieved is a much-needed focus in ECEC, since teachers in ECEC take care of children in groups all the time, yet their behavioral repertoire and professional language for doing so is limited (Kutnick et al., 2007; Van Schaik et al., 2014, Winther-Lindqvist, 2023). Caring well for children is usually understood psychologically as responding to children's individual needs in ECEC. We raise a critical discussion of this understanding relying on life-philosopher K. Løgstrup and cultural developmental psychologist Vygotsky and suggest an embodied and phenomenologically informed understanding of situated professional care in its place. We theorize and illustrate polyadic caring with reference to concepts of pedagogical atmosphere

and mood space (Bolnow 1963, 1989) and atmospheric competence (Griffero, 2019; Wolf, 2019). The communicative patterns involved in polyadic caring in ECEC are illustrated with empirical examples and we argue that this form of caring is essential for promoting formation and development in preschool children.

Reading habits in students: an embodied approach

Juan Toro

According to the OECD and experts in education, teenagers, in general, read less than before, struggle with long-form reading, and report a decline in the joy of reading. Although this phenomenon has attracted the attention of researchers and pedagogues, it is a remaining question what causes this unfortunate development. In this talk I will focus on reading habits developed by first-year university students to shed light on this problem.

I will start by presenting an embodied and organicist account of habits based on recent enactive developments, emphasizing the normativity of habits and the plasticity of action afforded by a network of habits. Habits, according to this organicist account, are not automatic responses to stimuli, but processes occurring at the personal (conscious) level, involving the person's body, the social environment, and other habits. This conception resonates with the phenomenological claim that habits are necessarily embodied and situated: habits are a way of being in the world.

Within this framework, I will analyze experiential reports of reading offered by university students after reading different sorts of texts, in a semi-experimental setup I carried out. This analysis will foreground the normativity underlying the reading habits developed by university students: reading silently, still, and uninterruptedly. I will show some relevant links between this normativity and a cognitivist and disembodied conception of reading and learning that has been influential in educational practices. The presentation ends with a reflection on how to modify reading habits, and what sorts of habits should be encouraged at schools to increase the joy of reading and to foster more creative, imaginative, and critical readers. This final reflection is supported by empirical observations of embodied strategies of reading developed by students, and a brief discussion on what it means to be an expert reader.

Scaling impact: opportunities and challenges of translating Embodied Learning research to scalable resources for teachers

Andrew Manches, Sara Price, Euan Mitchell

Embodied Learning research presents a timely example of growing calls to address gaps between educational research and practice. Recent work has identified key principles for educators (e.g., (Macrine & Fugate, 2022; Nathan, 2021); yet evidence for translation in everyday practice is limited. The contribution of this talk is to share successes and challenges of a practitioner-academic co-developed Embodied Learning self-study course for early years practitioners to help critical discussion of the complex ways in which practitioners actively interpret and enact research messages in their context. The paper draws upon interviews with ten teachers who participated in a series of three workshops designed to communicate embodied learning messages that drew upon existing literature as well as a preceding multi-site international early science learning project. Through a grounded theory approach to analysis, themes were identified from interviews which revealed a nuanced picture of why participants

found training valuable (e.g., validating expertise), and identified three tensions in teachers' interpreted value of the research for their teaching practice: i) extent to which ideas were interpreted as novel or close to existing ideas (less impression; more relatable), ii) value of resources (immediate appeal; potential message distortion), and iii) complexities of integrating practitioner insight into messages. The paper proposes how these tensions might be navigated by contributing two additional guidelines for existing translation frameworks: i) importance of early exploration of existing perceptions and priorities for different audiences of translation, and ii) early consideration of how messages can translate to standalone resources (e.g. products, videos, games) that can scale impact. We reflect on the implications of this embodiment translational work, using the training course and related commercialized card game as critical examples. The paper advocates greater academic-practitioner collaboration in the development of these scalable resources requiring ongoing consideration of how research messages are interpreted differently across audiences.

"Sculpting and embodying pathways for transformation towards social and environmental justice"

Melanie Roselyne Studer & Ruth Förster

The aim of this experiential workshop is to explore the potential of embodiment for sustainability (higher) education. While there is a growing emphasis on sustainability in higher education, the majority of initiatives remain predominantly cognitive, overlooking the profound impact that embodiment can have in fostering a more personal connection to social and environmental issues as well as the potential of tapping into the wisdom of the body, in different ways of knowing, to uncover pathways of transformation. This supports particularly on one hand envisioning and imagining new pathways and on the other hand taking action and thus bridging the "knowledge - action" gap. Drawing inspiration from Social Presencing Theater (Hayashi, 2017), Theater of the Oppressed (Boal, 1993) and the Tamalpa Life Art Process (TLAP, Halprin, 2002), the workshop will unfold in two distinct parts: experience and reflection. In the first part, participants will engage in body group sculptures, embodying a social and environmental justice case study and exploring pathways for transformation by physically transitioning to a different group sculpture state. The exercise will be repeated once in order for participants to experience both the role of observers/witness as well as of actors. In the second part of the workshop, we will debrief on the experience by using the 4L retrospective technique - participants will reflect on what they Loved, Loathed, Learned, and Longed for during the embodied experience. We will complement these with reflection tools from the TLAP, exploring the transfer of the experience in participants' working environment. This reflective process will offer insights into the personal and collective experiences of the participants, shedding light on the potential of embodiment and our chosen process in the context of social and environmental justice education.

Seeing with hands and touching with eyes: recovering sensorial attention to nature in primary schools

Laura Colucci-Gray, Jonathan Hancock, Riasat Islam, Nirwan Sharma, Andrew Manches, Lisa Bowers, Poppy Lakeman Fraser, Stephen Moizer, Julie Newman, Stefan Rueger, Advait Siddharthan,

Keywords: Digital haptic; textures; touch; feedback; sustainability

At the heart of the current environmental crisis lies arguably a wider crisis, our loss of ability to perceive ourselves as part of an interconnected living world (Kimmerer, 2013). We contend that, counterintuitively, the digital touchscreens that captivate our children can also help reconnect them with nature. To this purpose, we designed digital haptic experiences for embodied interactions that prime affective dispositions towards the natural world. Part of a UKRI-funded project (SENSE, EP/V042351/1), the study involved 302 children aged 6-12 across 10 primary schools in England and Scotland. Focusing on tactile feedback, indoor activities included direct tactile exploration of natural objects (e.g., feathers, pinecones, leaves) and digital haptic exploration of textures from nature (e.g., tree barks, fur, scales) via newly designed haptic interfaces. These helped children gain confidence for undertaking outdoor touch-based activities, e.g., designing creatures from clay and natural materials scavenged from the school grounds, adapted to survive within those grounds. The found that this naturally led to further scientific questions and explorations around texture (e.g. why are some tree barks rough and others smooth; why are bumblebees furry and why do they buzz?). Data were collected through photos, audio and video recordings, and observation notes. Across the study, we found children using touch to make sense of familiar and unfamiliar objects in new ways, supported by hand and facial gestures, and leading to new observations and questions. Without prior priming, results also pointed to the complex and significant role of digital haptics in integrating children's exploration of the natural world with their communication and imaginative abilities, e.g., expressed through the use of over 100 distinct metaphors and 100 tactile adjectives. We argue that a focus on touch discloses the opportunities for attentionality – as the capacity to ‘pay attention’ – through the intermodality of touch and vision, for “one can literally see with the hands and touch with the eyes” (Paterson, 2007). Emphasising digital and natural touch in science education supports interconnectedness with nature and learning about sustainability. In this context, the school environment is offered as a ‘place’ for all children both to learn and belong (Kimmerer, 2013).

Students perspective on embodied education in Higher Education - An analysis of the EPFL course “Collective creation: improvised arts and engineering”

Melanie Roselyne Studer

What are the benefits, challenges and enabling factors to integrating embodied education at the Higher Education level? This presentation addresses this broad topic by analyzing the feedbacks of 10 alumni engineering students who participated over the past 7 years in the experiential and embodied course “Collective creation: improvised arts and engineering” taught yearly since 2017 at the Swiss Federal Institute of Technology of Lausanne (EPFL). This 6 ECTS elective course leads students into improvisation techniques developed in the performing arts (theatre, music, dance, performance) and questions their possible transposition to engineering design practices.

Our analysis reveals the myriads benefits reported by students such as developing trust, deeper interpersonal relationships, team spirit, kinesthetic empathy, deep listening, self-confidence, playfulness, risk taking, and reflexivity. Furthermore, students note their appreciation for the effect of the course on their wellbeing, as well as sense of joy and aliveness.

Enabling factors for successful embodied learning experiences, as identified by students, include the provision of an appropriate physical space, the establishment of a safe and brave

psychological space, fostering a more horizontal student-teacher relationship, having no right or wrong answers, focusing on the learning process rather than the outcome and scaffolding the learning activities.

In addition to highlighting the benefits and enabling factors of embodied learning, our study explores the challenges students face when attempting to transfer the skills acquired in an embodied way to different contexts. This comprehensive examination sheds light on the complexities involved in integrating embodied education into the higher learning landscape and underscores the potential transformative impact on students' personal and professional development.

Sublime pedagogy. Exploring the role of the body in higher education

Massimiliano Tarozzi, University of Bologna

Learning ethical sensitive issues topics requires students to move beyond cognitive and open themselves up to socio-emotional and behavioural learnings. Global Citizenship (GC) Education is one of these issues (Bosio,2021): a multifaceted, ill-defined approach, widely promoted worldwide, which is expected to engage students to become active citizens and responsible agents of change for a more just, peaceful and sustainable world.

However, in teaching GC in universities, a deep gap is inevitably created between the abstract dimension of the values it embraces and the concrete daily reality, which often denies any idea of global ethics.

Therefore, students constantly need an embodied GC which acknowledges the global dimension within their subjective lived experiences and their relationships with others.

Against this background, this paper addresses the challenge of teaching values-based and transformative topics in higher education. After an overview of the theoretical framework of embodied education underpinned in a phenomenological perspective (Francesconi, Tarozzi 2019), the paper reports the results of an investigation carried out during two academic courses offered by the University of Bologna: an experimental cross-curricular course on “GC competence”, and a GC Winter school organized in Tunis for Italian and Maghrebi students. Both courses included multidisciplinary lectures, community living, a workshop on the theatre of the oppressed and study visits in challenging settings (such as refugee camps). Students were stimulated to mobilize their bodies through real (study visits) and symbolic (theatre) lived experiences, to embody abstract concepts related to GC by experiencing activities to stimulate a deep awareness of the implications of GC-related issues.

In conclusion, I have called “sublime pedagogy” that learning embodied experience which encourages students through challenging experiences to deconstruct their ordinary worldview and be surprised and amazed by the unexpected, on which to build an active commitment to change.

Teaching Bodies: Movement-based Performing Arts as an Approach to Embodied Teaching and Learning in Secondary Teacher-Training

Nicoletta Cappello (UdG, UniCT), Dolors Cañabate (UdG), Liana M. Daher (UniCT)

The present article explores how Movement-based Performing Arts lessons that focus on bodily imagination may expand Secondary School Teachers' learning experiences and teaching

strategies, by providing them with hands on tools to apply embodied learning in their classrooms. The aim of the research is to describe the kind of learning that is enhanced in the context of a secondary school teacher training dedicated to movement-based performing arts that focus on bodily imagination, by analyzing the kind of experiences and emotions described by participants. The study adopts the approach of an arts-based action research and the lens of interpretive inquiry, involving two groups of secondary school teachers in Spain and in Italy. Teachers as agents of change must train their imagination, in order to prepare students to envision and shape just realities and transform society (Brown 2017). In my experience as a Performing and Teaching Artist I know in first person that imagination is an embodied process that is developed through an aware involvement of the body in the action of imagining something. In movement-based performing, aware physical perception is the ground of creativity (Zarrilli 2020), and imagination is a practice that lays at the root of educational process, and that has to be built over a basis: the horizontal union between body and mind inside physical movement. Despite this artistic knowledge, in mainstream culture and education imagination is dissociated from the body and movement and mostly reduced to visualization (Zarrilli 2020), excluding oppressed and colonized embodied imaginaries and reducing creativity's educational potential. In the urgency of striving successfully through the present crisis, we must decolonize our Teacher Education system and update it with embodied, creative and movement-based performing practices in order to involve teachers, and students, as co-creators of more just and sustainable futures.

TENTACULAR PEDAGOGY: AN EMBODIED STRATEGY TO TRANSFORM HIGHER EDUCATION CULTURE

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Higher Education (HE) is broken. Its dog-eat-dog culture, neoliberalist structures and austerity measures have made it a harmful and non-inclusive space for many, especially minoritised staff and students, including those who learn differently.

In this presentation, I will introduce 'Tentacular Pedagogy' (TP), an embodied, inter-disciplinary strategy to teaching and (un-)learning that seeks to transform HE culture. Drawing on kinaesthetic and neurodivergent performance and participatory art, non-western body-mind poetics, as well as the extraordinary features of *three* hearts and *nine* minds of the octopus (hence 'tentacular'), TP counters Cartesian dualism and critiques the academy's sedentary and logocentric conventions. Prioritising equity, diversity and inclusion (EDI), as well as creative thinking (the highest order of learning in the revised Blooms taxonomy), I will outline the heart(s) of TP, namely *neurodivergence*, *decolonisation*, *intersectionality*, as well as its 9 dimensions, namely *Critical Creativity*, *Co-Creation*, *Collage*, *Can-do (resourcefulness)*, *Curiosity*, *Community + (under-)Commons + Civic consciousness*, *Circulation (sustainability)*, *Curating Change through Care, and Courage*. I will share case studies, including from my portfolio in UK, Japan and Singapore as a HE teacher and consultant, and lived experience as a neurodivergent learner, to show how embodied tactics can respond to UNESCO's call for HE to 'repair injustices while transforming the future' by 2050, with a new 'social contract' that prioritises 'human dignity and cultural diversity', plus 'care, reciprocity, and solidarity' (2021).

The presentation draws on extracts from my forthcoming book, *Re-Imagining Leadership: An A-Z Towards Collective Liberation via Neuro-Futurism, Monster-Mapping and One Hyper-Active Octo-Pussy* (Palgrave Macmillan 2024), which re-claims ways to think about and do 'leadership' by colliding creative pedagogy, neuro-queering, critical leadership studies and social justice for the first time. It will also advance my iterations of TP thus far, including as a keynote lecture for

the European League of Institutes of the Arts Teachers Academy (ELIA, 2021), an [article](#) for *The Society for Research into Higher Education* (2022), and my successful Principal Fellowship of Advance Higher Education application ([PFHEA](#), UK's highest HE qualification, 2022).

The EC Based habilitative drama workshop: a perspective of workshop training intervention open to educational, therapeutic, and social inclusion contexts.

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Through the use of artistic languages, it is possible to activate an almost infinite series of personal, intrapersonal and interpersonal dynamics (Gallese, 2008), such as to make the resources of the individual and the work group tangible and usable.

The approach to this activity is deeply rooted in the paradigm of embodied cognitive science, as the body perceived, experienced, and communicated to the other becomes a fundamental vehicle for the acquisition of new knowledge and skills (Gamelli, 2011).

This methodology, which takes the name of EC Based Habilitative Drama Workshop (Cuccaro, Gentilozzi, 2021), uses tools and techniques pertaining to different artistic languages (theatre, writing, music, body movement) carefully designed and calibrated with respect to the target group of the intervention, to promote the effective activation of the individual within the group itself (Di Dago, 2008).

Over the years, HDW-EC activities have been carried out in various training contexts: schools of all levels, pathological addictions, mental health, disabilities. In close connection with the reference educational team, the HDW-EC operator promotes dynamics of self-expression and self-knowledge and conveys activities useful for a progressive discovery of one's own abilities and capacities (Pitruzzella, 2004).

In this workshop, practical experiences of HDW-EC will be presented, and it will be possible to try out the workshop experience oneself, and methodological guidelines for structuring an HDW-EC experience.

Our approach integrates a person-centered philosophy (Rogers, 1986; Bion, 1962) and group dynamics. Participants will engage in individualized reflections, sharing empathic connections within the group. We will highlight the interplay of self and group, celebrating individual contributions and achievements within the collective narrative. Considering external influences and promoting emotional differentiation, the workshop will become a canvas where participants will unravel the intricate threads of personal, interpersonal, and systemic dynamics, fostering holistic growth (Morin, 2015).

The Aesthetics of Listening to Youth Perspectives on Participation Possibilities within the Classroom Community

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For over a decade, more and more students have experienced school attendance problems (SAPs) in most parts of the Western World. Although many researchers have approached the phenomenon from different theoretical perspectives, the core of the problem remains somewhat

of an educational mystery in a Danish school context. It is commonly acknowledged within educational research that listening to student perspectives on pedagogical and didactic issues relating to participation possibilities is essential to understanding unique experiences. Nevertheless, these perspectives lack international research on SAPs, and a clinical and individualistic approach dominates the research field. In my Ph.D. study, I use poetic inquiry (Faulkner, 2020) to interact with empirical material targeting knowledge on SAPs and belonging in the classroom community. Through qualitative interviews, I search for resonance that can create a more in-depth and nuanced analysis of students' lived bodily experiences with SAPs. Furthermore, through a field study, I research student perspectives on classroom atmospheres to investigate if atmosphere-informed classroom management could strengthen participation possibilities for more students inside the classroom community and thereby prevent a further increase in SAPs. In this presentation, I will discuss how listening to student perspectives contains an aesthetic element that originates in emotions, senses, and atmospheres. Also, I will discuss how a someaesthetic (Shusterman, 2012) approach to listening can expand the understanding of including student perspectives in qualitative research. I claim that interviews analyzed through poetic representations are a way to triangulate the empirical material to understand better the experiences of facilitators and barriers to participation possibilities in Danish schools. Holding this perspective against my field-study findings on classroom atmospheres, I aim to contribute with an alternative understanding of SAPs that originates in interactionist and situated theory (Lave & Wenger, 2012).

The Body as a researching-teaching Instrument

Ulrike Scholtes

“Our body is the ultimate instrument of all our external knowledge, whether intellectual or practical,” wrote Michael Polanyi (1966). As ‘tacit knowledge’, embodied knowledge is often framed as implicit: difficult to articulate, whether through words or through teaching. Building on my academic and artistic research on embodied knowledge and methods (Scholtes 2022; 2023) and on my experience as an artist, body worker and teacher, I unpack the idea of the body as instrument: not just as a metaphor or descriptor, but as a performative imagery. How can “the body as instrument” make us aware of and sensitive and attentive to our body and our teaching practices in unexpected ways? And how could this notion help us to make the work of Embodied Education explicit? The first part of the workshop offers short (feeling, moving, relating, documenting and reflecting) exercises that prompt participants to become aware of their body as sensitive and attuning instruments, based on my teaching experience of body work and body awareness as academic skills for future artists and scientists. I approach the body not just as a (objective) body we have, or a (subjective) body we are, but as a (practice-specific) body we do (Mol 2002, Mol and Law 2004), unpacking research as a material-semiotic practice and disentangling the specificities of the bodies that research practices invite, facilitate, affect, afford, allow for and bring into being. Next, I invite participants to explore how these skills can be relevant for art education professionals. What ways of being body aware, which embodied skills and methods, and what kinds of “embodied labour” (see Scholtes, forthcoming) does educational work require, allow and afford for? How do bodies relate to education and how do they bring each other into being? What are generous (Despret 2006), caring (de la Bellacasa 2017), and attuned (Scholtes 2022) ways of calibrating our body as teaching-instruments? I will offer participants take-home writing exercises, that can help them work on making their embodied labour visible and explicit.

The classroom as situation; analysis and applications

Heijmeskamp et al.

We view the classroom as a *situation* in John Dewey's senseⁱⁱⁱ, foregoing the common subject-centered approachⁱⁱⁱ. A situation is a meaningful qualitative background for action and examining the classroom as such, opens space for additional interventions in learning processes. In our analysis, four overlapping but distinct features of situations can be identified: complexity, determinedness, establishment of expectations, and restrictiveness. Situations can be more or less complex in a spatial, temporal, or layered way. They can also be more or less determined, meaning that the agent's actions are more or less obvious. Third, they can be characterized as socially established, meaning that certain behavior is expected. Finally, situations are more or less restricted, denoting the number of activities available to an agent. The situation shapes the agency of a subject, and its features can be manipulated to improve the pupil's perspectives for action. We focus on a typical classroom, give an analysis of how this classroom is differently experienced by different pupils, and show how interventions change the pupil's situation. For instance, by demonstrating the steps a pupil should take when faced with an obstacle, the teacher solves the indeterminacy of the situation, but leaves the degree of restrictiveness intact. This intervention does not further the pupil's repertoire of possible actions, and one would do better to guide the pupil to different possible actions. Our analysis throws new light on many classroom interventions.

The embodied analytical practitioner

Pernille Damm Mønsted Pjedsted & Uffe Ladegaard, UCL, University College

In this paper we focus on student teachers' analytical work as a transaction - an experience (Dewey, 2007, s. 104). Previous studies have pointed out that students analyze their practice by focusing on logical solutions rather than seeing and understanding the practice they participate in (Pjedsted and Ladegaard 2024). In the study presented here, we seek to create a shared place-embodied-analytical experience with the students. Here we draw on phenomenological and pragmatist perspectives in a transitioning, analytical discussion with the students. Our perspective on analytical work, is that analysis sometimes produces a truth that otherwise would not have existed, and it gives us the opportunity to change what we do and who we are (Bjerre 2015 p. 35). As part of this transaction, we make the "obvious obvious" and "hidden obvious" (Bjerre 2015 and Brinkmann 2012) which see practice without any interpretations, and in this process both the student and the lecturer becomes knowing bodies (Casey, 2009). The study has two phases. A completed part where we in a self-selected course on analyzing practice creates an analytical place through, for example, film clips. Our preliminary results from this phase is that the students undergo a transaction where they develop a perspective on the surroundings, as far richer with meaning, than what they notice when they only see what is necessary to come up with quick solutions. In the next phase we change the place to the school practice in the student's integrated internship. This last phase takes place in the late spring and in the autumn of 2024. In both phases we study the analytical transaction together with the student and in this we are alternating between observations and analytical discussions. In doing this we draw on both observations as participants and interviews as participant observations (Rubow 2003).

Keywords: transitioning analytical discussion, transaction, embodied places

The importance of the state of awareness in the physical and emotional experience and in educational action.

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According to Embodied Cognition, cognitive processes depend on bodily experiences and emotions have an important weight in these processes ; this perspective offers an integrated view that sees the human being as a complex system in which body, mind, emotion and environment are interconnected (Gomez Paloma, Damiani, 2021). In this Workshop we will present, from the ECS perspective, Conscious Attention and Self-Awareness activities to highlight the functionality of bodily and emotional experience in learning processes and the importance of the state of awareness in educational action (Siegel, 2009). We would propose Conscious Attention to Feeling and Breathing exercises that allow us to get in touch with bodily perceptions and balance emotions with each other while integrating them with the cognitive sphere and the environment. We'll experience Heart Coherence practice, a breathing technique who changes our heart rhythm (HRV) and impacts on our emotional and stress management and on our cognitive performance. Heart Coherence is studied by HeartMath Institute and there are over 300 peer-reviewed or independent studies utilizing HeartMath techniques or technologies to achieve beneficial outcomes that have been published, also in the educational field. Heart Coherence practice is supported by heart rhythm coherence monitoring and biofeedback technology, that helps understanding how to shift our heart rhythm patterns. Our HRV patterns are caotic or coherent, depending on our emotional state and we can change them through a particular breathing exercise and recalling the experience of positive emotions. We will present the first data from an ongoing trial in two Italian elementary school where these activities based on self-awareness techniques are being tested to create a state of psychological and physical well-being in daily life that predisposes to learning and an inclusive school climate.

The Role of the Body in Imagining Encounters with Forces of Nature

Hans U. Fuchs, Alessandro Gelmi, Angelika Pahl, Chiara Puecher, Federico Corni

In this workshop, we want to involve participants in a form of play where people take the roles of Forces of Nature such as Wind, Water, Light, and Electricity, and enact their actions and interactions in natural and technical systems. These plays—which we call Forces-of-Nature Theater (FoN-T) performances—provide for experiencing the embodied logic inherent in physical phenomena.

FoN-T performances derive from our feeling of embodied agency which, as a consequence of direct physical and narrative experiencing, is the source of how we imagine Forces as agents. Simply put, we *experience Forces of Nature as causative entities having a form not unlike how we perceive ourselves—as a gestalt with a body*. Such bodies have three fundamental characteristics—namely, intensity or tension, extension or size, and power—that form the embodied-imaginative elements of theories of these Forces. Mimetically re-enacting our encounters with Forces allows us to experience them and their logic through an imaginative form of communication.

We will briefly introduce participants to the elements of our imaginative approach to encounters with nature and then jointly engage in an embodied simulation of a narrative where Wind interacts with Water in old windmills (or with Electricity in modern wind turbines).

The state of embodiment in STEM education: A systematic review of how embodied cognition is used in k-12 STEM education

Fridtjof Gjengset, Magdalena Kersting, and Jesper Bruun

Empirical studies have shown that instructional approaches that build on embodied cognition perspectives can help improve k-12 STEM education; however, these studies often originate from different disciplinary traditions, draw on different understandings of embodiment, and focus on different aspects of the learning process. Consequently, we lack a comprehensive overview of embodiment in STEM education that represents the field as a whole. In response, this study provides a systematic literature review of how embodied cognition has been used in k-12 STEM education. We identified and analyzed empirical studies from three major databases (Scopus, ERIC, and Web of Science), using both thematic- and network analysis. The inclusion of network analysis allows us to establish statistical patterns that might have gone unnoticed by thematic analysis alone, which makes it a potent combination of analytical tools. We used an inclusive and flexible query, meant to capture any relevant empirical studies on embodiment, across all STEM subjects, k-12 gradelevels, and disciplinary traditions. Our findings bring to light (1) why researchers choose to draw on embodied cognition in k-12 STEM education, (2) what aspect of embodiment they focus on, and (3) how they evaluate the outcome of the embodied activity. These results will help inform instructional practices by highlighting commonalities across effective uses of embodiment in STEM education. Our findings will also provide guidance for future empirical studies by uncovering underrepresented or unexplored avenues of embodiment in k-12 STEM education.

The Temporal Affinity between Boredom and Mindfulness in Educational Contexts

Nils Langer Primdahl

While the application of mindfulness practices in schools has expanded rapidly in recent years, the valorization of specific temporal states, e.g. being in the present moment, which plays a central part in the teaching of mindfulness, remains underexplored (Primdahl 2023). Further, the idea that mindfulness represents a potential remedy to boredom is widespread particularly within the field of educational psychology (Trunnell et al. 1996; Waterschoot et al. 2021). In parallel to mindfulness practices, boredom also carry a number of temporal implications conditioned by specific conceptualizations of the present moment (Anderson 2004; Danckert & Allman 2005). This paper aims to give a theoretical analysis of the temporal intersections between mindfulness and boredom framed as two states of the embodied mind with significance in educational settings. Specifically, my interest is guided by the role of the present moment as an object of continued attainment (mindfulness) on the one side, and as a modality of discomfort or something to be fended off on the other (boredom). It is argued, that this juxtaposition represents a challenge to the idea prevalent in current discussions of education and schooling that the ability of students to sustain a state of being linked to present moment is a desirable goal. Rather, we should aim to develop a sensitivity towards the normative complexity of such temporal ideals, inclusive of the potential affinity between boredom and mindfulness. This opens up possibilities for a broader rethinking of current discussions of students' wellbeing in relation to time and temporalit

Touch in Learning: An embodied approach to understanding and evaluating the role of touch in science education.

Jonathan Hancock, Andrew Manches, Laura Colucci-Gray, Advait Siddharthan

Keywords: touch; haptics; science education; sensorimotor learning; gesture

Increasing attention to outdoor experiences and haptic technologies have demanded greater understanding of the role of touch in education; yet learning mechanisms behind touch remain unclear and less researched compared to the visual and auditory senses (Novak & Schwan, 2021). Here, in work from an interdisciplinary project (SENSE, **EP/V042351/1**) designing haptic learning experiences, we draw upon Embodied Cognition as a theoretical and methodological lens to examine how touch plays a role in children's interaction in science learning contexts.

The study involved 39 semi-structured videoed interviews in a classroom context with 82 children in pairs/triads. Children were aged 5-11 and from six schools across Scotland. Interviews involved a method for children to describe a range of nature objects (e.g. shell, pinecone, leaf) in front of them with structured prompts to attend to tactile properties. Videos were analysed via a multimodal and sensory ethnographic lens (Jewitt & Leder Mackley, 2019).

Analysis revealed richness of touch in children's interaction and communication of objects, which differed significantly between interviews and individual children. With recognition of the influence of socio-contextual factors in individual interaction, analysis revealed four key dimensions for the role of touch: *propensity to touch*; *richness of touch interaction*; *richness of tactile language*; and *richness of tactile gesture*. An ordinal scale of 1-4 was created to capture variation in these dimensions for individual children and achieved good interrater reliability.

The study contributes to embodied claims for the importance of sensory experience in conceptual development, notably our identification of gestures suggesting the internalisation of touch experiences in communication. Our cross-sectional approach limits any claims about learning but provides a key step in operationalising touch interaction in learning contexts, a means with which to examine if and how variation in touch experiences impact educational outcomes, and a frame with which to consider how touch interaction might be encouraged.

Towards an Embodied and Enacted Computational Thinking in Primary Education

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In 2006 Jeanette Wing defined Computational Thinking (CT) as a non-technological form of thinking that can be found in various aspects of human living. Building on Wing's definition, other scholars have advanced alternative definitions of CT, analysing the basic cognitive processes involved in it. Despite the growing interest in the topic, to the best of our knowledge, there is no unanimous agreement in the literature either on the set of mental processes that are linked to computational thinking or, consequently, on the definition of computational thinking as a high-level skill.

From our perspective, Embodied Cognition and Enactivism can play a decisive role in the study and analysis not only of the cognitive skills and processes associated with CT but also in the planning of educational practices aimed at teaching and enhancing CT at primary school.

We argue that CT reasoning processes should be seen as cognitive events during which cognizers are adapted to entrench computational concepts (mathematical and logical concepts) within

physical contexts. For instance, it is possible to identify spatial navigation as the first computational thinking task tackled in early childhood.

Furthermore, if we look specifically at different teaching activities implemented in primary school to stimulate CT, we can identify in them some macro-categories of 'situational examples' related to the centrality of the body and the actions of the body: e.g., the use of motion primitives (forward, backward, turn right, turn left).

Our contribution aims to present the different research works conducted by our research group in this context, focusing on the role of the body and the actions of the body in the social environment as an open door to new teaching practices of CT and to new and more articulated definitions of it.

Keywords: Computational Thinking, Embodied Cognition, Enactivism, Spatial skills, Primary Education.

Up one notch: a workshop on how performance artists become performance philosophers (too)

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Between methodology and model, we have developed an approach on the cusp between “artistic research in performance” and “performance philosophy” which proposes a certain way of leading one's performance art dialogue with another field of knowledge: in our case, this would be the ethics of Levinas (1961). Implicit in this approach is a certain ethics of “being a performer” and of how to interact with other ways of being, which shows some resemblances with Conquergood's (1995) visions on the ethnography of performance, enhancing performance art's unique capacity to explore affordances.

When performance art dialogues with philosophy, it manages to so do by embodying it. In turn, embodying philosophy allows the performer to shed new light on philosophy, generating knowledge (e.g., on the limits of Levinasian phenomenology). It also helps smudge some preconceptions such as “philosophy is theory, and performance is practice”, as we shall see how performance can generate theory, and also how handling Levinas entails an important practical dimension. We shall nevertheless discuss if everything can be assimilable to some notion of cognition or knowledge.

The workshop has an intention of empowerment and pedagogy/transmission: along the lines of Nauha's (2017) “learning by contamination”, the approach can be easily appropriated and adapted by performance artists, so they gain ownership and entitlement to do performance philosophy or artistic research themselves (and not to have their art a mere object of study by third parties).

The workshop would ideally stimulate performers-philosophers to dare further in case they are doing artistic research in an institutional/academic setting, and to challenge that setting: the pregnancy time for developing performances dialoguing with philosophy might be longer than usual, and that extra time is ethically justifiable. It is also ethically justifiable to combat some disembodiment of performance that academic analysis and archiving processes tend to carry out.

Using narratives to foster meaningful experiences in Physical Education in early primary school – an embodied perspective

Esben Stilund Volshøj VIA University College in Aarhus, Denmark & Norwegian School of Sport Science in Oslo

With this workshop, I wish to present a tentative analysis of an embodied approach to early primary school pupils' meaningful experiences in Physical Education (PE). The analysis draws on a currently running PhD. project that employs a qualitative approach, using action research as the methodology (Kemmis et al., 2014), together with four Danish teachers and pupils from their respective classes from 1th -3 th grade. The analysis is informed by theory of Enactivism (Gallagher, 2017) and phenomenology of the body (Böhme, 2010) suggesting that pupils' meaningful experiences in PE arises not only out of their active bodily engagement with the world but also out of how the world passively affects the pupils in bodily ways. Furthermore, the analysis is informed by a theory of enactive cognition (De Jaegher & Di Paolo, 2007) that suggest sense-making processes in social encounters are founded on a regulated coupling at the level of direct bodily engagement. This proposes that teachers and pupils in bodily ways mutually affect each other, co-creating novel meanings that were not available to them on their own. The analysis indicates that narrative teaching approaches such as creating scenic descriptions or using enactive metaphors (Gallagher & Lindgren, 2015) have a particular emphasis on early primary school pupils and appeal them to engage in PE. The narrative approach offer the pupils an opportunity to co-create experiences and reveal new meaning in PE. The workshop will first present the phenomenological and enactive theoretical lens and second offer a tentative analysis of PE-teachers use of narratives to attend early primary school pupils to reveal new meaning in and with the world of PE at the level of direct bodily engagement. Finally, the workshop provides a few practical examples of narrative teaching approaches in early primary school PE from the present action research study.

What matters with(in) animated body metamorphosis? Extension of perceptual and meaningful boundaries through embedded vision

Camilla Barbanti, Pierangelo Barone, Veronica Berni and Monica Facciocchi

The workshop suggests an educational experience of embodied knowledge about the animated image and an exploration into the power of the filmic dispositif in terms of the generation, perception and incorporation that is linked to the dimension of bodily experience. The filmic dispositif will be adopted as an apparatus (Barad, 2007), endowed with an agentiveness on its own capable of making "dimensions of our aisthesis habitually neutralised by our sensorial limitations and/or habits appear to our senses" (Kittler, 1986). By constructing an experience of inhabitation within the threshold (Genette, 1969), we will wonder about the limits of the body and the dialectical positioning between human and non-human creatures, giving space for the otherness of the world. The course will allow one to explore the possibility of becoming-other-than-self as a becomingself, experiencing one's own non-being. During the workshop, excerpts from Miyazaki's film *Howl's Moving Castle*, containing hybrid and metamorphic body images, will be shown, enabling participants to experience a "becoming-animated" process (Bissonnette 2019). This process involves the creation of an empathic contact with the filmic image that generates affective reverberations in the subject, thereby making permeable and extending its perceptive boundaries. The participant can thus perceive the animated image in an embodied dimension, experiencing neural, sensorimotor and emotional reconfigurations. Such reconfigurations, entangled with the enactive interpretation (Varela, 1992) of the percipient's experience, can be interpreted as a breakdown that triggers a mutation of the individual's emotional and affective states, bringing about a cognitive restructuring (Barone, 1997). The

animated image thus generates a sudden conjunction of something ordinary, within an animated dimension of transformation, to the bodily memory of situated experiences, which "literally raises another memory that reconfigures the present itself" (Didi-Huberman, 2015), revealing its educational power.

“Your song of freedom”. Adopting music therapy methods and techniques for university students’ orientation.

Leonardo Menegola

Drawing on educational and anthropological observation, and feedback from students participating in an orientation workshop based on music therapy (MT), started at Milano Bicocca University in 2023, we analyze how MT active and passive techniques to explore music and sounds let participants scout the rational and affective scenarios of their past and present choices, leading them to underpin and renew biographical constructions and prospects, and ultimately to maintain and grow their personhood, confronting each other on decision-making dynamics and individual identity connotations.

MT’s creative tools and artistic languages allow participants to spark enaction and eventually a process of meaning-making and inter-personal narrative around emotions, perceptions, aspirations, uncertainties, at a liminal zone of sense where individual and collective experiences mirror one another, triggering active contemplation and understanding. In students’ words, playing or singing one’s internal and motivational “state of the art” on one’s university and life path, hence elaborating on that, prove to be of considerable educational impact.

MT experiences disclose ritual and symbolic terrains; metaphorization and unraveling of meaning; projective reflections of one’s own needs and feeling of self; images, atmospheres and reverberations inhabiting one’s experiential horizons, offering participants a chance to harmonize with a renewed, empowered awareness of their present and future.

Music’s potential for poietic expression is entrusted to a mindful, embodied educational relationship: the educator-music therapist facilitates in-depth metacognition, self-assessment, narrative, autobiographical unfolding, also drawing from in-group confrontation and dialogue in a tutelary framework, according to an aspirational-vocational-desiring and strategic-finalistic-designing guidance model.

In educational perspective, MT-based orientation sheds light on the centrality of nonverbal, embodied, codical, phatic mediators of learning experiences, and emphasizes the facilitating power of creating an "object" in which to ideally place "our" meanings, and of fostering an environment, where truths safely can be searched and shared. MT emerges as an art-based engine for educational research to scale-up embodied processes to pedagogical conceptual domains.