

Body, Relationship, and Learning: Developing and Pilot-Testing a Mixed-Methods Questionnaire for an Embodied Drama Workshop

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Abstract: This contribution explores the perspective of Embodied Cognition as an epistemological, design and operational basis for the Habilitative Drama Workshop (HDW), understood as an Embodied Cognition-based pedagogical practice in which learning emerges from the dynamic interaction between gesture, action and physical environment. In the HDW workshop, the body is taken as an epistemic device: through sensory involvement, relational attunement and symbolic play, participants activate physical, emotional and cognitive resources in the encounter between themselves and others experienced in a shared action that allows for the reorganisation of perceptions and meanings. The logic of “as if” creates a safe and reversible reality that allows participants to explore identities, negotiate roles and experiment with alternative forms of agency. According to the logic of enactive learning and the principles of the extended mind, learning is conceived as a process distributed among bodies, objects and social interactions. The contribution also presents the construction and pilot testing of a questionnaire aimed at detecting university students' perceptions of the bodily, relational and metacognitive outcomes of the workshop, integrating a reading inspired by the ICF model and a mixed-methods analysis.

Keywords: Embodied cognition; drama-based learning; habilitative drama workshop; relational ecologies; inclusion.



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1. Introduction

Cognitive and educational sciences have moved shifted beyond “internalist” accounts of learning towards paradigms where knowledge arises from social participation and an organism–environment coupling. Embodied Cognition conceives learning as situated and relational, emerging from interactions among sensorimotor systems, affect, ecological constraints, and social exchanges (Varela, Thompson, & Rosch, 1991). Grounded Cognition likewise attributes a constitutive role to perceptual motor simulations and bodily states in concept and judgement formation (Barsalou, 2008). From this perspective, cognition may extend beyond the in-

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dividual through artefacts, spatial configurations, and social interactions (Clark & Chalmers, 1998; Hutchins, 1995), while learning entails reshaping participation and negotiating meaning within communities of practice (Lave & Wenger, 1991).

The Habilitative Drama Workshop (HDW) align with this framework as a process-centred device integrating dramatic practices with embodied education to foster situated learning and relational skills (Cuccaro, Gentilozzi, & Gomez Paloma, 2024). It positions the body as an epistemic and pedagogical resource in the interplay of corporeality, space, and relationship, within a participatory and inclusive approach (Cuccaro, Gentilozzi, & Brancato, 2025; Gomez Paloma, 2013). A key mechanism is the creation of “as-if worlds”, enabling reversible exploration of roles and dilemmas that supports agency under controlled risk; process drama research links this to engagement, participation, and skill development through the dramatic frame as an infrastructure for intentional action and meaning negotiation (Danckwardt-Lillieström et al., 2024; Luo, Ismail, Ahmad, & Guo, 2024). These claims align with embodied intersubjectivity accounts (Gallese, 2003) and evidence connecting perception and action in understanding others’ actions (Rizzolatti & Craighero, 2004). Given this complexity, the study pilot-tests a mixed-format questionnaire to assess perceived bodily, relational, and metacognitive outcomes, also interpreted via ICF axes to capture facilitators and barriers in the setting (World Health Organization, 2001).

2. Body, drama and learning as relational ecology

We consider learning an emergent phenomenon that stabilises through the interaction of body, environment, and social practices, rather than as the individual acquisition of content. The unit of analysis is, in fact, represented by a system of activities in which knowledge is dynamically configured in the relationship between relational experiences, bodily experiences and perceived spatial experiences. It is also supported by material and symbolic resources that participate in cognitive dynamics (Varela, Thompson, & Rosch, 1991; Clark & Chalmers, 1998). This dynamic is made explicit during the activation of HDW laboratory practices. The context determines what participants understand with respect to the shared framework in which different phenomena are recombined and renegotiated, effectively generating new meanings.

A first key to interpreting the laboratory as relational ecology is that of affordances. If the environment represents a set of possibilities for action related to the capabilities of individuals (Gibson, 1979), space, objects, rules, and instructions enable and constrain learning. In HDW, the design of the spatial layout, the attention to interpersonal dynamics, the presence or absence of physical objects and the design of the task configure affordances for initiative, exploration, proximity, cooperation and symbolisation (Hutchins, 1995).

A second key to interpreting the activity as a relational environment is attunement, understood as mutual understanding and co-regulatory activity: the other makes themselves available as a partner in a co-regulated field of action (Gallese, 2003; Rizzolatti & Craighero, 2004). In dramatic work, attunement acts through fine regulation of rhythms, prosody, proxemics, posture, and eye contact, supporting the maintenance of the frame, the negotiation of roles, and implicit emotional modulation. The final aspect to consider concerns language understood as a semiotic practice distributed between body and context: meaning and participation are constructed in a multimodal way, expanding the channels of participation and reducing exclusive reliance on verbal competence.

Therefore, if we intend to holistically assess the impact of this type of activity, the evaluation of embodied practices would need to capture perceptual, relational and metacognitive transformations that cannot be fully reduced to quantitative indicators. If the experience is organised ecologically (affordance), supported by co-regulation (attunement) and expressed through plural forms of communication (language), the

evaluation should use tools capable of documenting both the perceived intensity and the interpretative processes through which participants attribute meaning to what they have experienced.

This rationale underpins our use of Likert items alongside open-ended questions to describe perceived outcomes and the narrative–semantic framework that renders them intelligible.

3. Construction of the instrument: development of the questionnaire and rationale for the items

The evaluation of training interventions based on embodied and dramatic-expressive practices requires measurement devices capable of capturing outcomes that exceed observable performance and declarative learning, including transformations in bodily awareness, situated participation, relational processes, and metacognition. In this context, students' subjective perceptions are a relevant source of information, provided they are collected using instruments that are consistent with the theoretical framework and constructed according to explicit criteria of content validity (relevance, comprehensiveness, understandability) and semantic clarity of items (DeVellis, 2016; Terwee et al., 2018). In line with best practices for scale development and initial validation, this study adopts an integrated measurement system, combining a set of Likert scale items with a section of open-ended questions: the former produce standardised and comparable indicators, while the latter document mechanisms, conditions and meanings of the experience, supporting triangulation between quantitative and qualitative evidence (Boateng et al., 2018; Creswell & Plano Clark, 2018; Tashakkori & Teddlie, 2010). This choice responds to a central need in 'ecological' training contexts: to avoid reducing transformative changes, which are often situated and multifaceted, to a single summary index.

3.1 Questionnaire structure and dimensions investigated

The questionnaire (see Appendix) was structured into sections, each aligned with a specific construct and analytical aim to support a multidimensional reading of perceived outcomes. It includes: *a) anonymised background and context variables* (e.g., gender, age group, programme/year, subject area, prior drama/theatre experience), used to describe the sample and, in later stages, to explore subgroup differences and potential differential item functioning (DeVellis, 2016); *b) a Likert battery* targeting four interrelated domains: (i) bodily and cognitive engagement (attention, presence, action-mediated understanding), (ii) expressiveness and agency (experimentation, initiative, perceived freedom/non-judgement), (iii) relational climate and proximity (cohesion, trust, acceptance, management of physical closeness), and (iv) perceived usefulness/transferability, consistent with an ecological view of learning as a configuration of mutually supporting elements (Clark & Chalmers, 1998; Varela, Thompson, & Rosch, 1991); *c) an ICF-inspired section* to frame outcomes within a bio-psycho-social and inclusive model of situated functioning, covering body functions (b), body structures (s), activities and participation (d), environmental factors (e), and personal factors, thus treating environmental conditions as part of the outcome rather than a mere backdrop (World Health Organisation, 2001); and *d) open-ended questions* eliciting perceived transformations, meaningful episodes, transferability, and suggestions to improve effectiveness and accessibility, enabling thematic and lexical analyses to inform interpretation and iterative item refinement (Braun & Clarke, 2006; Creswell & Plano Clark, 2018).

3.2 Theoretical rationale for item selection (construct–item mapping)

The items were generated based on a mapping of theoretical constructs and empirical indicators, according to *item writing* principles oriented towards clarity, specificity and reduction of semantic ambiguity (DeVellis, 2016). According to COSMIN guidelines on content validity, the construction considers: (i) relevance of items to the construct; (ii) adequate coverage of relevant dimensions; (iii) comprehensibility for the target population, with attention to formulation in accessible, non-technical language, while maintaining conceptual precision (Terwee et al., 2018). The dimensions analysed are listed below: a) *Embodied dimension (body–cognition–attention)*. Items related to body awareness, concentration and action-mediated understanding remain consistent with the assumption that cognition is rooted in perception and situated action, and that learning emerges from organism–environment interaction (Varela et al., 1991). The inclusion of indicators such as 'attention' and 'understanding' in relation to bodily activities was intended to enable embodiment to be read as an epistemic dimension (not simply as enjoyment), distinguishing between appreciation of the experience and recognition of an effect on one's own way of understanding and participating; b) *Dramatic-expressive dimension (agency, exploration, as-if)*.

The significant elements of the experiment to detect personal expression and communicative development were designed to capture the potential of the *dramatic process* as a *simulated* environment conducive to the exploration of roles and perspectives, supporting participatory action within a set of shared conditions. With this approach, “non-evaluation” and “freedom” are not considered as generic emotional states, but as indicators of conditions that favour initiative, controlled risk, reversibility and the reformulation of action.

This approach is consistent with the literature that attributes a structuring function to the dramatic frame for participation, engagement and meaning construction (Luo et al., 2024) and with studies that highlight how process drama can support agency in complex tasks through shared responsibility and negotiation of perspectives (Danckwardt-Lillieström et al., 2024); c) *Relational dimension (cohesion, acceptance, proximity)*. The items relating to cohesion, acceptance and management of physical proximity respond to the hypothesis that learning in embodied contexts is supported by processes of intersubjectivity, in which the relationship operates as a cognitive and regulatory resource (Gallese, 2003). The inclusion of *proximity* as a measurable dimension is motivated by the need to monitor safety, respect and comfort, which are crucial elements for the accessibility of the experience and for the quality of participation in body-based learning environments; d) *Inclusive and bio-psycho-social dimension (ICF)*. Integration with the ICF aims to make outcomes analysable as configurations of functioning (), highlighting not only individual changes but also environmental conditions that can facilitate or hinder participation and learning. This is to achieve an inclusive and contextualised reading of outcomes and identify micro-barriers and facilitators of the setting, enhancing the environmental dimension as an integral part of the educational experience (World Health Organisation, 2001). The main information on the dimensions investigated in the questionnaire can be found in Table 1.

Table 1: Summary map of the dimensions investigated by the questionnaire (constructs and operational indicators), with correspondence to the ICF functioning axes and related sections/types of data (Likert items and open-ended questions) used for quantitative-qualitative triangulation.

Dimension (construct)	Operational indicators (examples)	ICF reference (axes)	Type of data / Section of the questionnaire
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Dimension (construct)	Operational indicators (examples)	ICF reference (axes)	Type of data / Section of the questionnaire
Physical and cognitive engagement	Attention, presence, action-mediated understanding	Body functions (b); Activity and participation (d)	Likert + Open items (narratives on attention/understanding)
Expressiveness and agency	Experimentation, initiative, freedom/absence of judgement	Activity and participation (d); Personal factors	Likert + Open items (episodes of agency, controlled risk)
Relational climate and proximity	Cohesion, trust, acceptance, management of physical proximity	Environmental factors (e); Activity and participation (d)	Likert + Open items (experiences of safety/proximity)
Perceived usefulness and transferability	Applicability beyond the laboratory (training/profession)	Activity and participation (d); Personal factors	Likert + Open items (transferability, concrete examples)
ICF axes: body	Body awareness, posture, tension, body image	Body functions (b); Body structures (s)	ICF + Open section (somatic descriptions)
ICF axes: context	Setting, climate, conduct, facilitators/barriers	Environmental factors (e); Personal factors	ICF + Open section (barriers/facilitators)
Open questions (cross-cutting)	Turning points, meanings, suggestions for effectiveness/accessibility	All ICF axes (b/s/d/e + personal)	Open (lexicometry + thematic analysis)

3.3 Methodological choices: mixed-methods design and triangulation

The tool was developed on the assumption that no single method of data collection is sufficient to represent the complexity of embodied learning processes. For this reason, a mixed-methods approach was adopted, in which Likert scales produce synthetic and comparable indicators, while open-ended questions generate narrative data useful for explaining mechanisms, conditions and meanings (Creswell & Plano Clark, 2018). During the analysis phase, quantitative results (descriptive statistics and internal reliability) are integrated with qualitative analyses (lexicometry and thematic coding) to verify convergences and divergences between what students 'quantify' and what they narrate as experienced, and to use qualitative data as a resource for refining the tool. This triangulation is consistent with methodological guidelines on good practices for the development and initial validation of instruments, which recommend

successive iterations between empirical evidence, theory and item revision, especially when constructs are complex and situated (Boateng et al., 2018; DeVellis, 2016; Tashakkori & Teddlie, 2010).

4. Discussion

The study therefore adopts a convergent mixed-methods design, in which quantitative data (Likert scale items) and qualitative data (open-ended questions) are collected in the same time frame, analysed using separate procedures and then integrated at the interpretative level (Creswell & Plano Clark, 2018). On the quantitative side, the analysis has preliminary exploratory and psychometric purposes, aimed at describing distributions, central tendencies and initial properties of the battery (internal consistency and item diagnostics). On the qualitative side, the analysis aims to reconstruct cores of meaning and interpretative categories that describe how participants attribute meaning to the experience, producing evidence useful both for understanding the results and for the iterative refinement of the instrument (Braun & Clarke, 2006; Creswell & Plano Clark, 2018). The integration of the two sets of results is conceived as triangulation, understood as a systematic comparison between numerical patterns and narrative patterns to identify convergences, divergences and sensitive areas of the training programme, with particular attention to the setting conditions that can act as facilitators or barriers to participation.

4.1 Participants and context

The pilot test involved 11 university students from the Educational Design Methods and Techniques course at the University of Cassino and Southern Lazio. The sample consisted mainly of students enrolled in master's degree programmes, with backgrounds in the pedagogical-humanistic field. Participation was anonymous and voluntary, with participants completing an online form. Given the pilot nature of the study, the sample was not designed to support generalisable inferences, but to verify: (i) the feasibility of the administration; (ii) the comprehensibility of the items; (iii) the distribution of responses and the absence of obvious critical issues (e.g. non-discriminatory or systematically misunderstood items); (iv) the preliminary consistency between the theoretical structure of the instrument and observable empirical patterns (DeVellis, 2016). In line with good instrument development practices, the pilot is intended as a *refinement* phase, necessary prior to validation on larger and more diverse samples (Boateng et al., 2018).

4.2 Instrument

The instrument used is a questionnaire divided into four sections: (a) anonymised personal data and context variables; (b) a battery of items on a Likert scale (1–5) relating to the perception of the laboratory experience; (c) an in-depth section inspired by the ICF model; (d) open-ended questions focused on perceived transformations, episodes of meaningful learning, transferability and facilitating/hindering factors. This analysis focuses on: (i) the psychometric pilot relating to the first 10 Likert questions (descriptive analysis and internal reliability) and (ii) the set of responses to the open-ended questions for qualitative exploration (lexicometry and thematic analysis).

The decision to focus on an initial set of items in the pilot phase is consistent with an incremental approach to scale development, aimed at identifying critical issues in formulation and basic psychometric properties at an early stage before moving on to more complex validation procedures (DeVellis, 2016; Boateng et al., 2018).

4.3 Procedure

The questionnaire was administered online (Google Forms) at the end of the workshop. At the start of the questionnaire, participants received a summary information sheet explaining the research objectives, the voluntary nature of participation and the anonymity of responses. The questionnaire was completed individually. The data were exported in Excel format, with minimisation of potentially identifying variables and careful management of the dataset (secure storage and limited access). The files were then imported into an analysis environment for statistical and textual processing.

4.4 Data analysis plan

A) Quantitative Analysis. The first 10 Likert questions were analysed using: (a) descriptive statistics (mean, standard deviation, minimum–maximum values) and frequency distributions for each response category (1–5); (b) estimation of internal reliability using *Cronbach's alpha*, adopted as a preliminary indicator of internal consistency of the item set; (c) item diagnostics, using corrected item–total correlations and alpha 'if deleted', in order to identify items that are less consistent or potentially interpretable as baseline/context measures (expectations, familiarity, predispositions) rather than as indicators of perceived outcome (DeVellis, 2016). Due to the small sample size ($n = 11$), no exploratory or confirmatory factor analyses were conducted, as these require larger samples and are an objective of the next phase of instrument validation (Boateng et al., 2018).

B) Qualitative analysis (lexicometric and categorical). Open-ended responses were analysed through a three-step integrated procedure: 1) lexicometric analysis (corpus construction, orthographic normalisation, stop-word removal, and extraction of word/bigram frequencies) to identify recurring semantic nuclei and collocations and to inform interpretative coding; 2) thematic analysis (coding, theme development, and macro-category definition, supported by anonymised exemplar quotes) to map patterns of meaning in the data (Braun & Clarke, 2006); and 3) triangulation with quantitative results by comparing numerical patterns (e.g., means, dispersion, critical items) with emerging themes and lexicon to identify convergences/divergences and setting-sensitive dimensions, informing item refinement and hypotheses for subsequent validation (Creswell & Plano Clark, 2018).

5. Results

The pilot test involved $n = 11$ university students; given the small sample size, the quantitative results are interpreted descriptively and as preliminary psychometric indications, in line with the recommendations for the initial stages of instrument development (DeVellis, 2016). Overall, a markedly positive perception of the experience emerges: most items have averages in the 4–5 range. The highest indicators concern the role of physical activities in supporting learning and participation: understanding of content ($M = 4.55$; $SD = 0.69$) and active participation ($M = 4.45$; $SD = 0.69$). High scores also appear for concentration ($M = 4.36$; $SD = 0.67$) and confidence in relational skills ($M = 4.36$; $SD = 0.92$). The dimensions of awareness and expressiveness show positive but slightly more moderate ratings: body–emotion–learning ($M = 4.18$; $SD = 0.75$), personal expression ($M = 4.09$; $SD = 0.70$), group cohesion ($M = 4.09$; $SD = 0.83$) and communication skills ($M = 4.27$; $SD = 0.79$). Two items are more 'sensitive' in terms of variability and interpretation: initial preparation ($M = 3.55$; $SD =$

0.69), likely more related to familiarity/expectations, and freedom to experiment without judgement ($M = 3.91$; $SD = 1.22$; $\min = 1$), which suggests individual differences and/or micro-conditions of the setting in the perception of psychological safety. An analysis of the first 10 questions reveals high internal consistency (Cronbach's $\alpha = 0.91$), which should be interpreted with caution and verified on larger samples (DeVellis, 2016).

In this quantitative analysis, the other items in the questionnaire were not included, as in the pilot phase it was considered necessary to provide an initial verification of the feasibility, comprehensibility of the items and preliminary psychometric consistency. However, all items were administered in full and can be examined through extensive descriptive and psychometric analyses in the subsequent validation phase with larger samples.

Therefore, these items are treated here as part of a “developing” scale, contributing to the coverage of the construct (e.g., ICF domains, transferability, facilitators/barriers) and providing useful information for the iterative refinement of the instrument. Item-total diagnostics also indicate that initial preparation has a lower item-total correlation ($r \approx 0.23$) and a slightly higher alpha 'if deleted', suggesting that it should be treated as a baseline/context rather than an outcome. Table 2 shows the descriptive statistics for all items (1–34), and the overall reliability of the battery is high (Cronbach's $\alpha = 0.972$).

Table 2: Descriptive statistics of the Likert items in the questionnaire (pilot test; $n = 11$). For each item (1–34), the abbreviated text and mean values (SD) on a scale of 1–5 are reported; the overall internal reliability of the battery is high (Cronbach's $\alpha = 0.972$).

Item	Text (abbreviated)	Mean (SD)
1	I felt prepared to tackle a workshop based on embodied cognition.	3.55 (0.69)
2	Physical involvement encouraged my active participation.	4.45 (0.69)
3	I felt more aware of the relationship between body, emotion and learning.	4.18 (0.75)
4	The embodied approach improved my concentration.	4.36 (0.67)
5	The theatrical dimension facilitated personal expression.	4.09 (0.70)
6	Drama activities improved my communication skills.	4.27 (0.79)
7	I felt free to experiment without fear of judgement.	3.91 (1.22)
8	I felt an increase in confidence in my interpersonal skills.	4.36 (0.92)
9	I noticed greater cohesion within the group.	4.09 (0.83)
10	The presenter created a safe and welcoming atmosphere.	4.82 (0.40)

Item	Text (abbreviated)	Mean (SD)
11	I perceived the workshop atmosphere as non-judgmental.	3.55 (0.69)
12	I perceived the group as welcoming and respectful.	4.64 (0.67)
13	I experienced physical proximity in the workshop as respectful.	4.27 (0.65)
14	I felt respected in terms of my personal boundaries.	4.00 (0.77)
15	I felt a reduction in my physical tension.	3.36 (0.92)
16	I noticed an improvement in my body awareness.	4.09 (0.83)
17	I have noticed an improvement in my ability to listen to my body.	4.09 (0.70)
18	I have noticed an improvement in my ability to pay attention.	4.18 (0.75)
19	I have noticed an improvement in my ability to regulate my emotions.	4.36 (0.92)
20	I have noticed an improvement in my non-verbal communication skills.	4.27 (0.79)
21	I have noticed an improvement in my ability to relate to space.	4.09 (0.70)
22	I felt capable of participating actively and independently.	4.73 (0.47)
23	I perceived an improvement in my ability to take initiative.	4.09 (0.70)
24	I have noticed an improvement in my ability to cooperate.	3.91 (0.94)
25	I have noticed an improvement in my ability to negotiate roles and tasks.	3.82 (0.75)
26	I have noticed an improvement in my ability to put myself in someone else's shoes.	4.45 (0.82)
27	I have noticed an improvement in my ability to reflect on my learning style.	3.91 (0.94)
28	I have noticed an improvement in my ability to connect theory and practice.	3.82 (0.75)
29	I believe that the workshop has improved my teaching effectiveness.	4.09 (0.70)
30	I felt more in touch with my personal resources.	4.64 (0.67)
31	I perceived an improvement in my ability to manage exposure.	3.27 (1.01)
32	I believe this experience has been formative for my professional future.	4.36 (0.81)
33	I believe that this type of workshop can be useful in inclusive	4.09 (0.83)

Item	Text (abbreviated)	Mean (SD)
	contexts.	
34	I felt that the workshop respected my personal pace and limits.	3.55 (0.93)

5.1 Qualitative results: lexical and categorical analysis of open-ended questions

The open-ended responses were analysed through (i) descriptive lexical analysis and (ii) thematic analysis aimed at identifying recurring meanings and providing an interpretative explanation of the perceived processes (Braun & Clarke, 2006). Four interconnected semantic aspects emerged from the responses – body/sensations, relationship/group, learning/reflection, and theory/practice – consistent with the conceptual structure of the questionnaire. From a lexical perspective, recurring terms referred to embodied experience (e.g., body, sensations, awareness) along with cognitive/metacognitive processes (understanding, learning, reflection) and relational indicators (group, relationship). References to *space* and *practice* highlighted the importance of environmental conditions and the operational dimension of learning. Common bigrams (e.g., *greater awareness*, *bodily sensations*, *body-mind*, *paying attention*, *bodily tensions*, *verbal communication*) further portray the experience as a restructuring of bodily perception, awareness, and interaction.

Thematic analysis identified six non-mutually exclusive macro-categories: (1) bodily awareness (the body as a source of signals and memory: posture, tension, breathing); (2) learning-metacognition (greater awareness of learning processes and reflection on action); (3) group relations (cohesion, trust, quality of participation, teamwork); (4) emotion regulation (relaxation, breathing, links between posture and emotions); (5) theory-practice-transferability (learning as “tangible” and transferable); and (6) security-freedom (climate, perceived judgement, micro-conditions that enable/limit expression). In particular, the safety-freedom category supports an ecological interpretation: participants define outcomes as being conditioned not only by activities, but also by how space, proximity, and implicit norms affect participation and comfort. These macro-categories are summarised in Table 3 (Tab.3).

Table 3: Summary of the categorical analysis of open-ended responses: emerging macro-categories, operational definitions and main linguistic indicators, with anonymised sample extracts. The categories are not mutually exclusive and describe recurring dimensions of the students' experience with the HDW Laboratory.

Macro-category	Operational definition	Typical linguistic indicators	Example quote
1. Body awareness	The body as a source of information, memory and orientation for action	'body', 'posture', 'tensions', 'signals', 'sensations'	“The body... source of information: it communicates, reacts, remembers.”
2. Lear-	Awareness of how we learn and	"understanding",	"The body made

Macro-category	Operational definition	Typical linguistic indicators	Example quote
ning–metacognition	how action modifies understanding/attention	"comprehension", "reflection", "attention", "learning"	the theory immediate and tangible."
3. Relationship–group	Group as a cognitive and regulatory resource; trust, cooperation, cohesion	"group", "relationship", "trust", "teamwork", "sharing"	"Aspects... transferable... to any profession that requires teamwork."
4. Emotions–regulation	Connection between bodily signals and emotional states; self-regulation practices (breathing, relaxation)	"breathing", "relaxation", "calm", "emotion", "tension"	"It helped me... to listen better to the rhythm of my breathing... and to notice how certain postures influence the way I relate and move."
5. Theory–practice–transferability	Experience as a bridge between theory and application; applicability in future contexts	"practice", "theory", "useful", "transferable", "professional"	"The body made the theory immediate and tangible."
6. Security–freedom	Psychological security, perceived judgement, boundaries; environmental factors that facilitate/limit freedom	"judgement", "freedom", "space", "movement", "limits"	"Some elements... slightly limited freedom of movement."

5.2 Integration of results

The integration of quantitative and qualitative data highlights a substantial convergence, reinforcing the interpretability of the results from a mixed-methods perspective (Creswell & Plano Clark, 2018). The high averages for comprehension, participation, concentration and relational dimension are reflected in the narratives, which, , describe the body as a source of information, the relationship as a cognitive resource and practice as a bridge that makes theory tangible. At the same time, the greater variability on freedom from judgement is consistent with references to micro-conditions of the setting (space, constraints, proximity), suggesting that the effectiveness of the device also depends on the psychological and relational accessibility of the context, which can be better captured through a combination of Likert and open-ended responses.

6. Discussion

Despite the caution required by an exploratory sample, the results paint a consistent picture: Likert measures show high ratings on action-mediated understanding, participation, attention, and relational dimension, while open-ended responses refer to corporeality, relationship, and reflexivity (sensations, posture, breathing, group dynamics) and the 'tangibility' of theory in practice. The convergence between quantitative and qualitative data is consistent with embodied and ecological perspectives on learning, in which meaning emerges from the interaction between body, context and relationships, organising affordances for participation and the negotiation of meaning.

6.1 Evidence on perceived outcomes: corporeality, relationship, and metacognition

High ratings on bodily-activity items indicate that participants view action as an embodied mediator of learning, structuring attention, understanding, and engagement. Open-ended responses echo this through a somatic lexicon (e.g., body, sensations, breathing, posture), supporting the instrument's content validity in terms of relevance and comprehensibility (DeVellis, 2016; Terwee et al., 2018). Relationally, cohesion/trust and themes of group and teamwork suggest learning is experienced as embodied intersubjectivity (Gallese, 2003), framing the workshop as a relational ecology where meaning emerges through coordinated action. Finally, themes of reflection and awareness point to metacognition "in action," with bodily monitoring functioning as a regulatory resource during participation.

6.2 Psychological safety, 'non-judgement' and ecological sensitivity of the setting

The greater dispersion of the item on freedom to experiment without fear of judgement, in line with qualitative references to micro-conditions of the setting (space, mobility constraints, proximity), suggests that in EC-based devices, perceived safety is not uniform but emerges from the interaction between personal and environmental factors. This interpretation is consistent with the literature on *psychological safety*, which interprets safety as a socio-relational condition that enables learning risk and participation without fear of negative consequences (Edmondson, 1999).

The ICF framework also allows this variance to be framed as a systemic outcome, produced by the combination of the individual's functioning, their activity/participation and contextual factors (World Health Organisation, 2001). This leads to a practical recommendation for improving the questionnaire: reinforce the items relating to environmental factors and relational safety, making a clearer distinction between perceived safety, respect for boundaries, control of physical proximity and interactive norms (explicit and implicit), in order to better assess the circumstances that make experimentation feasible in practice.

6.3 Psychometric implications and refinement of the instrument: reliability, discriminative power and possible ceiling effects

Preliminary psychometric evidence suggests strong internal consistency, supporting further scale development. Item diagnostics, however, show that the "initial preparation" item is weakly aligned with the set, likely capturing a pre-experience condition (expectations/familiarity) rather than an outcome; it should therefore be treated as a baseline/covariate and excluded from composite outcome scores (DeVellis, 2016). The generally very high median values (4–5) also suggest possible

saturation effects, which may limit discrimination; future studies on larger samples should examine the distribution of scores and improve sensitivity by using words that better describe behaviours, with a wider range of responses and items covering different stages of intensity (Boateng et al., 2018; DeVellis, 2016). Finally, integrating lexical and thematic analyses yields a series of concrete refinement objectives: emerging groups and macro-categories, especially those related to safety/freedom and environmental barriers, provide useful information for modifying items and improving the ecological validity and content of the instrument (Terwee et al., 2018).

6.4 Limitations and research prospects

The main limitation of the study is the small sample size, which is adequate for a pilot study but insufficient for advanced psychometric analyses and generalisable inferences. In subsequent phases, it will be necessary to: (1) expand the sample and diversify its profile; (2) conduct exploratory and confirmatory factor analyses to verify dimensionality and latent structure; (3) assess temporal stability (test–retest) and, where relevant, measurement invariance between subgroups (e.g., gender, previous experience, subject area), so as to ensure comparability of measures and interpretative robustness (Putnick & Bornstein, 2016); (4) strengthen the inclusive anchoring of the questionnaire by exploring facilitators/barriers and the management of physical proximity as a sensitive dimension for participation in greater detail. This approach would reduce exclusive reliance on self-reported data and allow for a deeper understanding of the mechanisms underlying perceived outcomes, strengthening the triangulation between different levels of evidence.

7. Conclusion

The pilot programme generally receives high ratings on key aspects (action-mediated comprehension, active involvement, attentive support, relational climate). Two implications guide the next steps: 1) the point relating to *initial preparation* likely reflects initial expectations and familiarity rather than a result and should be considered a secondary variable, not included in composite scores; 2) Variability in freedom from judgement and qualitative references to microenvironmental constraints (space, proximity) indicate strong sensitivity to context, suggesting that effectiveness depends on the relational and spatio-temporal conditions that allow experimentation. The use of the ICF model is therefore promising for understanding outcomes as contextual functioning influenced by interactions between the individual and the environment. Future work should expand and diversify the sample, validate latent structure and test stability and cross-group comparability (Putnick & Bornstein, 2016), and integrate self-report with observational and interaction measures to strengthen ecological validity.

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Appendix: Questionnaire administered

Perception of the Embodied Cognition Based Dramatic Enablement Laboratory

Target audience: university students (anonymous and voluntary completion)

Instructions: respond based on the experience you have just had. Do not include any information that could identify you.

Estimated completion time: 15–20 minutes.

Participation in this questionnaire is voluntary and responses are collected anonymously. No identifying information is requested and we ask that you do not include any information that could make you recognisable. The data will be used exclusively for scientific research purposes in aggregate form and in accordance with the principles of minimisation and confidentiality. By continuing to complete the questionnaire, you declare that you have understood the information provided and give your informed consent to participate.

A1. General information (anonymised)

1. **Age group** (single choice)
☐ 18–20 ☐ 21–23 ☐ 24–26 ☐ 27–30 ☐ >30 ☐ I prefer not to answer
2. **Gender** (single choice)
☐ Female ☐ Male ☐ Non-binary/other ☐ Prefer not to answer
3. **Course of study** (single choice)
☐ Bachelor's degree ☐ Master's degree ☐ Master's/Other ☐ I prefer not to answer
4. **Year of study** (single choice)
☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th+ ☐ I prefer not to answer

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5. **Main subject area** (single choice)
☐ Education/Training ☐ Psychology ☐ Physical education ☐ Humanities ☐ STEM ☐ Other: _____
6. **Previous experience in theatre/drama workshops** (single choice)
☐ None ☐ Occasional ☐ Frequent ☐ Prefer not to answer

A2. Perception of workshop experience (Likert scale 1–5)

Scale: 1 = Strongly disagree · 2 = Disagree · 3 = Somewhat agree · 4 = Agree · 5 = Strongly agree

Items (1–34):

1. I felt prepared to tackle a workshop based on embodied cognition.
2. Physical involvement encouraged my active participation.
3. I felt more aware of the relationship between body, emotions and learning.
4. The embodied approach improved my concentration.
5. The theatrical dimension facilitated personal expression.
6. The dramatic activities improved my communication skills.
7. I felt free to experiment without fear of judgement.
8. I felt more confident in my interpersonal skills.
9. I felt greater cohesion within the group.
10. The facilitator created a safe and welcoming environment.
11. I felt that the workshop atmosphere was non-judgmental.
12. I felt that the group was welcoming and respectful.
13. I experienced physical proximity in the workshop as respectful.
14. I felt respected in my personal boundaries.
15. I felt a reduction in my physical tension.
16. I perceived an improvement in my bodily awareness.
17. I perceived an improvement in my ability to listen to my body.
18. I perceived an improvement in my ability to pay attention.
19. I felt an improvement in my ability to regulate my emotions.
20. I noticed an improvement in my non-verbal communication skills.
21. I have noticed an improvement in my relationship with space (orientation, posture, use of space).
22. I felt capable of participating actively and independently.
23. I noticed an improvement in my ability to take initiative.

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24. I noticed an improvement in my ability to cooperate.
 25. I noticed an improvement in my ability to negotiate roles and tasks.
 26. I noticed an improvement in my ability to put myself in someone else's shoes.
 27. I noticed an improvement in my ability to reflect on my learning style.
 28. I have noticed an improvement in my ability to connect theory and practice.
 29. I believe that the workshop has improved my training effectiveness.
 30. I felt more in touch with my personal resources.
 31. I noticed an improvement in my ability to manage exposure (putting myself out there in front of others).
 32. I believe that this experience has been formative for my professional future.
 33. I believe that this type of workshop can be useful in inclusive contexts.
 34. I felt that the workshop respected my personal pace and limits.

A3. ICF section (axes of functioning) — exploration items

(This section focuses on facilitators/ barriers and the perception of situated functioning; responses on a scale of 1–5 as above.)

Body functions/structures (b/s)

- A3.1 I felt an improvement in the regulation of bodily tensions during the activity.
A3.2 I perceived greater integration between bodily sensations and emotional states.
A3.3 I perceived greater awareness of body schema and posture.

Activity and participation (d)

- A3.4 I felt more capable of taking initiative in the group.
A3.5 I noticed an improvement in my participation, even in non-verbal tasks.
A3.6 I felt more capable of modulating communication (verbal/non-verbal) according to the context.

Environmental and personal factors (and + personal factors)

- A3.7 The space and organisation of the environment facilitated my participation.
A3.8 The way the session was conducted promoted safety and involvement.
A3.9 The management of physical proximity promoted comfort and accessibility.
A3.10 My personal resources (motivation, confidence, willingness to experiment) were activated during the workshop.

A4. Open questions (final section)

(Answer freely; you can give specific examples.)

1. What is the most significant aspect you take away from this experience?
2. Describe an episode or moment in which you perceived learning 'through the body'.
3. How did the workshop influence the way you relate to others (group, proximity, cooperation)?

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4. Have you noticed any changes in your awareness of posture, breathing, tension or emotional states? If so, describe them.
 5. How did the experience make a theoretical content or concept you studied more 'tangible'?
 6. What do you think is most transferable from this experience to other contexts (study, internship, work)?
 7. From an educational point of view, how (if at all) did the workshop improve skills useful for your professional profile (e.g. communication, group management, listening, presence, self-regulation)?
 8. Which elements of the setting (space, timing, deadlines, atmosphere, management) most facilitated your participation?
 9. Did you encounter any barriers or elements that limited your freedom of movement/expression or comfort in physical proximity? If so, what were they?
 10. What changes would you suggest to increase the training effectiveness and accessibility of the workshop for people with different needs?