

Embodied cognition: dance, body, and mind

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ABSTRACT

Embodied cognition is the concept that our intellectual abilities such as gaining knowledge, comprehending concepts, remembering, judging, and problem solving are not confined to our brain alone. It is the idea that the body influences the mind. As children, our bodily experiences are linked to abstract concepts, which lead to an embodiment of knowledge as our motor functions develop first leading to an implicit understanding of situations that are difficult to comprehend. Certain studies claim to show that embodied cognition helps in understanding the cognitive work load and supporting more efficient encoding and consolidation and the mind and body connect at a sensory level which allows the body to regenerate through enactive sensor receptive connections and encourages multi-scale embodied anticipation. A sample of 6 classical dancers was randomly selected from the city for Bangalore for the study. The results suggest that embodiment of learning, embodiment of movement, spirituality and wellness can be facilitated by dance.

Keywords: *Embodiment; Cognition; Dance; Body; Mind; Learning.*

The embodiment of cognition is when processes of the body play a significant causal or physically role in cognitive processing. It is the belief that the mind is not only connected to the body but the body influences the mind (Prinz, 2015). It holds a sharp contrast to Rene Descarte's theory of Dualism which states that there is a great difference between mind and body. Embodied cognition states that our cognition is perhaps determined by our experiences in the physical world. Relatively recent researchers on embodied cognition provide much food for thought (Wilson, Robert A and Foliga Lucia, 2017). Embodied cognition has been studied with concepts such as emotions, memory, language and intelligence.

There have been three historical anchors for understanding early work on embodied cognition. The book *The Embodied Mind* (Varela, Thompson and Rosch 1991) introduced the concept of enaction. It developed a framework that placed a strong emphasis on the notion that the experienced world can be portrayed and determined by mutual interactions among the physiology of the individual, its sensorimotor circuit and the environment. This view suggests that only those who have certain sensory resources such as- eyes, hands, legs and, skills- can acquire certain kinds of cognitive capabilities. Cognition is a dynamic sensorimotor activity and is not only conditioned by the neural activity but also essentially

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Embodied Cognition: Dance, Body, and Mind

enacted, in that it emerges through the bodily activities of the organisms (Varela, Thompson and Rosch, 1991).

Literature suggests that one's own bodily cues and affective reactions guide or constrain cognitive processing in social and moral realms. Bodily states when triggered during emotional experiences are re-enacted whenever certain situations occur and such re-enaction avoids the damaging consequence of one's course of action (Wilson, Foglia, Lucia, 2017). Gestures, facial expressions, intonations and bodily feedback do not simply lead to different understandings and conceptualization of the situation but are part of the physical machinery comprehending cognitive processes.

Embodiment effect on memory has been in accomplishing tasks such as reasoning and language understanding and how memory reflects different bodily capabilities. Hand-arm movements do not play a mere communicative role but facilitate the maintenance of spatial representations in working memory and recalling enacted action-phrases. This suggests that motor information may have become a part of the memory trace. Embodied simulation relies on motor competence, not on perceptual salience. The capability to form this stimulation is modulated by an individual's motor repertoire and expertise, and this strongly impacts recall (Pezzulo, Barca, Bocconi and Borghi, 2010). People use their bodies to record, store and cue memories. Some can move skillfully, without taking time to think, in complex and ever-changing environments because of cumulative expertise accrued in their history of dancing (Sutton, Williamson, 2014).

Dance, an activity endowed with intended expressivity and inherent affectivity, has been the target of research since the last decade. Dance is a cultural phenomenon and can be understood as a confluence between body and space revealed through a flow of expressive and intentional movements (Riberio and Fonseca, 2011). Classical dancers and teachers use imagery as a tool in practice as a simple conduit, a means by which something is transmitted. When dancers use imagery, they map aspects of the world to the body via analogy. Such mapping increases our understanding of the world and the body, making mental imagery fundamentally a process of embodied cognition (Fisher, 2017). Dancing mindfulness is a holistic wellness practice that facilitates improvement in emotional and spiritual well-being, increased acceptance, positive changes to the self and application of mindfulness techniques to real-world living (Marich and Howell, 2015). By being mindful in one's practice of dance, one connects their mind and body in a deeper sensory level allowing the body to become aware, better equipped and empowered as a whole. The current study is aimed at understanding embodied cognition process and feeling through the process of dance. The objective is to understand the influence of dance in aspects such as memory, emotional understanding and holistic development of classical dancers.

METHODOLOGY

Study setting and participants

Participants were recruited from official lists taken from the Ministry of Culture Govt. of Karnataka. The participants were between the ages of 27 to 53 comprising both sexes. The inclusion criteria were based on 1) experts in the field of classical dance, 2) can converse in English or Hindi, 3) trained for a minimum 5 years continuously, 4) Belonging to Bangalore and 5) Presently practicing or teaching dance. The exclusion criteria were based on 1) the presence of mental illness and 2) Experts in any other dance form than a classical dance form. Following these guidelines participants were invited to participate in the study.

Embodied Cognition: Dance, Body, and Mind

The interviews were arranged at places keeping in mind the convenience of the participant and the interviewer.

Study Design

Personal interviews were conducted in two vernacular languages- English and Hindi, according to the choice of the participant. Each discussion lasted for 30 mins to 45 mins.

Ethical Clearance

The paper was granted ethical clearance by Montfort College Institutional Ethical Review Board.

Data Collection

Socio demographic data was captured using a semi-structured questionnaire. Informed consent was taken from each participant. Theme question of the interview was introduced to the participant and the interviewer facilitated the discussion and the responses. Questions were focused around 4 main themes mainly student teacher interaction, memory, emotion and mindfulness. The questions aimed to gain insight into how these factors may have been influenced by the individual's practice of dance. The discussions were recorded using a digital voice recorder and in addition the researcher kept notes during the discussion.

Data Analysis

The audio files which were obtained from the discussion through the digital recorders were then translated (from the language of the interview to English) and transcribed (from a conversation format to written format). The Grounded Theory approach was used in assigning interpretive codes to each portion of the transcript in an iterative fashion based on principles of phenomenology. The Grounded theory involves the progressive identification and integration of categories of meaning from data. It is both the process of category identification and integration (as method) and its product (as theory). The Grounded theory method was adopted for the research as it allowed us to study the experiences of the dancers and collect it to embodied cognition. This method gave us the freedom to interpret and link experiences and develop a new holistic understanding of it. The transcribed files were uploaded to NVivo software. This software is used for analysing qualitative data.

RESULTS AND DISCUSSION

Embodiment of Learning

This qualitative research highlights the role played by embodiment of the mind and the body. Among these the role of embodiment on learning, movement and wellness were the major contributing factors. As stressed on in the concept of enaction those who have certain sensory resources such as- eyes, hands, legs, and skills- can acquire certain kinds of cognitive capabilities. Cognition is determined by sensorimotor activity that emerges through the bodily activities of the organism.

Analysis and findings of the current study lead to understanding that, learning is connected to physical and material conditions. Physical actions we preform and actions performed around us shape the mental experience of the situation (Sullivan, 2018). We suggest that the students mentally imitate the actions of their guru and this increased activity leads to increased recall. As recounted by a participant “while performing or practicing I try and remember the nooks and details I’ve noticed in my guru’s performance and I try to bring them into my own.” This human-centered learning through gestures of dance has a stimulating effect. Gestures made by the guru during practice have communicative and cognitive functions leading to increased

Embodied Cognition: Dance, Body, and Mind

learning. “Given that dance is all about expressing through gestures, they have added meaning. While practicing we learn to remember the steps through the story being conveyed.” Learning is grounded in perceptual and motor information. Dance can be described as physically attuned to see the body being-in-this-world. It allows learning to be not only be restricted as thinking or knowing, but as a complete memory- a complete re-enactment. The process of knowing becomes a holistic process with the integrated network that translates and interacts with life (Block & Kissell, 2015).

This re-enactment process is also experienced by the guru. The gurus experience the images and sensations as embodied thoughts when they see their students perform. The performance was done by students’ floods the gurus’ awareness with the sensations of all the gestures made by the students. “When I see my student perform, I can see my shadow in her. What you teach and if the student also takes it in, you can feel yourself in them. If you see me perform, you’ll be able to see my guru in me, see bits and piece of them in my performance.” The body remembers the gestures through embodied memory during classroom teaching. Dance captures experiences as a rich embodiment of knowledge and of expression (Anttila, 2016). “My body has to absorb the step. I know what step I have to do and so does my mind, but probably if I have not practiced my hand would not be so quick to showcase that step. The step has to sit in my body and my feet. My body has to absorb the emotion, the beats and the story to be able to portray it effectively. The coordination will not be there is my muscles do not know. It is not sufficient for my mind to know. Once you have practiced, I don’t have to put an effort to remember it comes naturally. Even if you wake me up from my sleep I can perform it well.”

Embodiment leads to the embeddedness of our culture, our language and our art. The participants have amply spoken about the benefits they have had due to their practice of dance. They have spoken lengths about how their learning capability is dependent on the ability of their body to remind them of the gestures. They said that they rely on gestures to evoke emotions and cognitions associated with the performance. The data suggest that dance has led to an embodiment among the participants. Their assumptions about thoughts, feelings and behaviors are grounded in sensory experiences and bodily states (Meier, Schnall, Schwarz & Bargh, 2012). Their mental processes are stimulated by body related perceptions and actions.

The human world exists in a world of symbolization and meaning tied to the material, the physical, the kinetic, the spatial and the temporal. Dance captures all these aspects of the human world (Block & Kissell, 2015).

The student guru relationship is based on larger timescale events that come to be embodied and anticipated during a dance session. The teacher is able to anticipate the student’s unique movement style as well as the trouble spots that student is having in dance. “it is beautiful to see how my student’s body has accepted the dance and I can see a part of myself in them and their performances.” This is so because the entrainment that occurs during sessions allows both student and teacher to embody each other’s movement dynamics. This results in an increased embodiment when both the teacher and student become able to anticipate one another’s movement and are able to orient themselves according to the other (Hahn and Jordan, 2014). In the present study, participants repeatedly mention being able to sense their bodies engaging (physically and emotionally) when they see their students perform. Researches based on the theory of event coding indicate that during movement (the auditory effect of hearing one’s feet on the floor) becomes associated with the planning of the initiated

Embodied Cognition: Dance, Body, and Mind

movement. As a result, when one later experiences the effect again (one hears the feet on the floor), the motor planning associated with the sensory effect gets activated (Hommel, Musseler, Aschersleben and Prinz, 2001). Observation of another's behavior gives rise to the activation of planning systems that one would use to produce the same behavior themselves. This goes to say that we perceive others directly, not in terms of behavior alone but also planning, intentionally and simultaneously (Jordon, 2014). Hence, dance incorporates physical environment bound by time and space and is essentially tied to the senses. The senses including kinetic are dependent on vision, touch, sound and rhythm, but more significantly on movement as it is the bodies' way of fundamentally connecting to meaning. This movement is dance (Block & Kissell, 2015).

Embodiment of Movement, Spirituality, and Dance

Theorist and choreographers in the early twentieth century have believed in the spirituality and emotional importance of dance. They have analyzed everyday movements between everyday occupations and religious observances and the structure of dance (Laban, 1988). A folk dance originating in Punjab, India, Bhangra, celebrates the beginning of the harvest time. The gestures of the dance mimic the sowing, harvesting and culling of wheat. Indian dance forms have been used to express religious stories and devotions. Stories are told through dance where the dancer expresses their devotion to God by expressing acts of heroism, compassion, surrender and love (Lothspeich & Rao, 2016). Several participants have spoken in length about the spiritual aspect involved in their dance performance. "Dancing makes me feel closer to God. While performing, I had to play the role of a prince who sees the love of his life get transformed into a flowering tree, which gets cut. When the prince sees this, I was emotionally overwhelmed and ended up in tears and left helpless."

Dance and Wellness

Dance has a long history of being seen as cathartic and therapeutic. In various cultures, people have embodied their inner-most feelings and thoughts in an outward expression of happiness, joy, grief and intense emotions through dance (Block & Kissell, 2015). In the ancient dance form, T'ai-chi aids in the fundamental awareness and integration of the body. It involves the embodiment of the integrated self. Participants also reported a stronger resilience, positive approach towards life, sensitivity, and acceptance due to their practice of dance. Although this finding cannot be individually predisposed to their practice of dance.

CONCLUSION

The current research links the literature on learning through instructional methods and embodied cognition. It argues that learning through movement, such as dance, increases learning, information retention and recall. The gestures of the guru represent bodily information that the student uses later to perform motor functions. We argue that by gaining information from an outside embodied source is a type of embodied experience, which is supported by current literature on embodiment theories. In various cultures, dance has played a central role in health enhancement and health promotion, including our own culture. As dance paves the way for greater appreciation towards diversity, towards the agency, identity and community; it is the key to developing a comprehensive view on learning. To close, we claim that the significance of this research extends to learning through embodiment and performative practice.

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Embodied Cognition: Dance, Body, and Mind

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Embodied Cognition: Dance, Body, and Mind

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Conflict of Interest

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