



How do the 4E approach and actives methodologies contribute to rethinking creativity in teacher training?

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Abstract

Creativity is considered one of the skills crucial for 21 Century to face the challenges proposed by the 2030 education agenda (Frey & Osborne 2013; OECD, 2018, Reimers & Chung 2019). In our reading, active methodologies such as project-based learning and design thinking are often seen as fundamental in favoring creativity together oriented towards individual, social, and planetary well-being (UN, 2022). A persistent problem for the training of 21st century skills, in which creativity, intellectual openness and computational thinking are essential in teacher training, is the adherence to cognitivist foundations and conventional methodologies. The traditional cognitivism has reduced the notion of creativity in processes and products. In our proposal, we want to redirect the question about what happens in the head (process) or in the world that makes people creative (world), rather, we invite creativity to be considered as a skillful experience embedded in a context and that arises from sensorimotor engagement and distributed perception (Varela, Thompson & Rosch, 1991; Hutchins 1995; Kalaydjian et al 2022).

In this sense, we propose the 4E cognition approach (embodied, enacted, embedded, and extended) as a necessary theoretical and empirical framework to guide the understanding of creativity in contexts of active methodologies. Project-Based Learning and Design Thinking teacher education often fosters creativity as a deep experience that emerges in engagement with artifacts and interaction with others, opening unprecedented possibilities for capturing emerging understanding and enhancing skillful performance in challenging tasks (Videla, Veloz and Pino, in press). However, active methodologies such as project-based learning and design thinking are hardly linked to contemporary paradigms of cognition that are anti-representationalist, embodied, and situated in sociocultural contexts. The 4E approach argues that cognition is intertwined with the world because of a history of structural couplings, that is, the contingent relationships that stage skillful performance in response to the situational sense of sensorimotor engagement with artifacts and people (Dreyfus, 2002). We assume that creativity is a skillful experience of kinesthetic 'knowledge' (Penny, 2022).

In teacher training, these ideas for cultivating creativity are overshadowed by conventional static methodologies and cognitive notions that reduce creativity to final products and internal mental processes (Guilford 1967; Torrance 1972; Sternberg & Grigorenko 2001; Gardner 1994; Kaufman & Beghetto 2009). Although these notions have contributed to understanding the phenomenon of creativity, in this article we relate to collective, distributed, and embodied notions of creativity that escape individual and cognitive bias (Glăveanu 2014; Ihde & Malafouris 2019; Malinin 2019). Our approach is in tune with Vygotsky's ideas about perceptual ontogenesis, in which perception is reconfigured from naive to cultural forms within dedicated cultural settings designed for exploratory activity (Vygotsky, 1926/2001). Considering the above, we present some didactic experiences through ethnographic participant observation, we observe students of pedagogies engaging in creative activities suggested by our theoretical approach. We use these observations to illustrate how Project-Based Learning and Design Thinking allow us to understand creativity from the point of view of experiential becoming, as argued by Tim Ingold (2014). That is, rethinking the creativity inherent in practice and paying attention to the development of contingent relationships, which emerge learning by doing from designing and prototyping with technologies.

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