Daring the Uncertain

Spaces of learning within the architectural education

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Abstract

The main concern of this paper is knowledge production within the architectural education - how spatial constructs representing and constituting society may catalyze critical making and thinking. Starting from the proposition that the discourse of architectural history involves transformative experiences, I turn to theories of learning and performativity in order to suggest how transformations happening through architecture may be possible to direct and evaluate within educational systems. I discuss possibilities of history by referring to Nancy Stieber, Friedrich Nietzsche and Michel Foucault, the notion of learning through ideas from Gilles Deleuze, Peter Sloterdijk, Ray Land and Jan H.F. Meyer, and the *performance* as a spatial event by turning to Erika Fischer-Lichte. I hope this paper contributes to that the efficiency hailed within educational systems today is imbued by ambiguity, and that – in effect – the ability of those systems to address perplexing aspects of the society we live in, is enhanced.

Keywords: learning, education, architectural history, performance, event

History and the power of experiences

The Argument

As the true method of knowledge is experiment, the true faculty of knowing must be the faculty which experiences.

This faculty I treat of. ¹

Acting within architecture means to embrace the randomness of its material – structures built and documents made more or less long ago. The intertwined discourses of architectural history and theory describe the reasons for and meanings of that material. They educate architects and others about how architecture can be understood. And still, as Peter Sloterdijk says: amazement comes before education.² Architectural structures can cause amazement.³ Thereby they can, I propose, force individuals – for example architecture students within an educational system – to question common agreements about what architecture does.

¹ Blake, William. 2007 (c. 1788). From: "All Religions are One." In: William Blake Poems – Selected by Patti Smith,

Sloterdijk, Peter. 2013 (2009). "Master Games - Trainers as Guarantors of the Art of Exaggeration," p. 273 ³ The fact that architecture can cause affection was discussed by Heinrich Wölfflin (1864-1945) and his contemporaries. Harry Francis Mallgrave proposes that the main question in Wölfflin's dissertation "Prolegomena to a Psychology of Architecture" (1886) - "How is it possible that architectural forms are able to express an emotion or mood?" - can be answered through the perspective of recent neuroscientific findings. (Mallgrave 2013, p. 121) This debate is left out of the present paper.

The architectural historian Nancy Stieber (2006) describes how architectural history has been influenced by "methodological challenges" posed by post-structuralists like Foucault.⁴ As a consequence, she says, has an interest in social and cultural processes behind buildings and architects rather than the buildings and architects *per se* been prevailing.⁵ However relevant such processes are, she continues, they have tended to be presented as grand narratives or theorized empirically untested ideas.⁶ Stieber notices that the gaze towards the reality of built space from the past has remained passive and generalizing. Architectural history could instead, she proposes, deepen the understanding of both theory and the built environment by providing analyses of concrete examples and making empirical tests of theories, and she asks:

So what happens when the passivity of 'symbolize, represent, and reflect' is replaced with active verbs such as 'transform, perform, inform'? What happens when architectural history begins to look at those spaces that are indeterminate, rather than looking only at the places of order, or find the indeterminancy in places of order as they are used, distorted, reinvested with meaning? ... ⁷

Inspired by Stieber's quest for "activating" architectural history, I search for ideas which might make it possible to see architectural space and learning experiences as *events*, i. e. as dynamic situations where matter and thought interact and presumptions about the order of things are challenged. An aim with this search is to give the human individual – be she an architect, scholar, learner, all of those or something else – possibilities to critically be involved in changing herself and her context.⁸

Foucault (1970) describes how the will to truth makes scholars violently control borders of discourses – for example History – by excluding the "abnormal" or perhaps just uncertain, so that they can relax and say they actually know something. In his reflections upon Nietzsche's genealogical perspectives towards history, Foucault (1971) states that we should question preconceived meanings and affinities wrong by descending towards concrete beginnings of things, not to find pure origins (truths) but differences, and reveal history as a myriad of random events. 10 Historians, says Nietzsche (1887), tend to look at things from a comfortable distance; historiography "affirms as little as it denies, it asserts and 'describes'." If we instead, as he proposes, question the value of truth and progress, and dare to be in events, feelings, sensuality, we can no longer believe in a general right or wrong but will have "... in our power the ability to engage and disengage our 'pros' and 'cons': we can use the difference in perspectives and affective interpretations of knowledge." As Andrew Leach (2010) has noted, abstraction and instrumentalization may be fundamental in the teaching and practising of architecture, but may also wrap knowledge up and make it reactive rather than active. 13 One of Foucault's key tips for opening up a discourse, or analyzing the conditions for the fear of that which we cannot control, is to "... restore the discourse its character as an event ... "14 Stieber, Leach and other architectural

⁴ Stieber, Nancy. 2006. "Space, time, and architectural history," p. 172.

⁵ Ibid, p. 173

⁶ Ibid, p. 176

⁷ Ibid, p. 178

⁸ Two scholars of architectural history concerned with space and the human being in space are August Schmarsow (1853-1936) and Bruno Zevi (1918-2000); I am studying and comparing their historiographies for another occasion.

⁹ Foucault, Michel. 1981 (1970). "The Order of Discourse."

¹⁰ Foucault, Michel. 1977 (1971). "Nietzsche, Genealogy, History," pp. 154-155

¹¹ Nietzsche, Friedrich. 2006 (1887). On the Genealogy of Morality, pp. 116-118

¹² Ibid, p. 87

¹³ Leach, Andrew. What is Architectural History?, pp. 102-103

¹⁴ Foucault, Michel. 1981 (1970). "The Order of Discourse," p. 66

historians still discuss discursive ties between generalizing orders and singular cases.¹⁵ With this paper I aim to contribute to that discussion by approaching architecture as an assemblage of events which individuals can learn through rather than know things about. This approach, I propose, may affect how architecture is taught.

Learning as intensity and confusion

I understand learning as a strive, or movement, towards knowing something more; a "living passage between non-knowledge and knowledge," to quote Gilles Deleuze (1968). To stay in the mode of learning requires courage and patience, it means to question everything that appears to be given, and still not give up, but make something with it. Deleuze talks about the danger of thinking that "problems are ready-made, and that they disappear in the responses or the solution." All models are arbitrary and the responses to them judged by temporary authorities, and once we forget the problem, says Deleuze, we will only produce "particular solutions" or signs restrained by the system we act within. As an exit from the representational paradigm of signs into moments of presence, Deleuze introduces the notion of difference, and says: "Something in the world forces us to think. This something is an object not of recognition but of a fundamental *encounter*." From this encounter – which trespasses the limits of what we can think, imagine and remember – stems both true critique and true creation, he says. The encounter is, as I understand it, an experience of trespassing the boundaries of the world as we were told to know it. Through that experience the infinite task of becoming through learning presents itself, and habitual structures of knowledge are left behind.

When Peter Sloterdijk talks about learning, he says that with the progress drive of civilizations "... the boundaries between the commonplace and the unusual are shifted – people increasingly become the creators of self-performed miracles." Humans discover difference within themselves through this process; they realize that they cannot go back to what they were, they have to move into the unknown. Those who have gone through the process, says Sloterdijk, can become teachers, or "provocateurs of the future, who build the catapults for shots into the supra-ordinary." Before there was such a thing as a school, says Sloterdijk, there was amazement; first "the miracle, then education." In Sloterdijk's world, pedagogics is a technical approach to humans. Teaching is about patiently guiding students through repetitions until they reach "the vertical wall on which to attempt the ascent to the impossible."

How do scholars of education describe learning? "Real learning" requires, says Leslie Schwartzman (2010), encountering and stepping into the unknown. To grasp the relativity of what we thought we knew might at first be a heavy burden of uncertainty, a dark experience of betweenness (or 'liminality'). However, as Ronald Barnett indicates, if pedagogy ignores ambiguity, it turns its back against society and becomes deceitfully smooth:

¹⁵ Another important contribution to this discussion is Mark Jarzombek's article "A Prolegomena to Critical Historiography" (*Journal of Architectural Education*, 52:4 (1999), pp. 197-206).

¹⁶ Deleuze, Gilles. 2004 (1968). "The Image of Thought," p. 206

¹⁷ Ibid, p. 197

¹⁸ Ibid, p. 202

¹⁹ Ibid, p. 176

²⁰ Ibid, pp. 176-180

²¹ Ibid, p. 206

²² Sloterdijk, Peter. 2013 (2009). "Cur Homo Artista – On the Ease of the Impossible," p. 190

²³ Ibid, p. 192

²⁴ Sloterdijk, Peter. 2013 (2009). "Master Games – Trainers as Guarantors of the Art of Exaggeration," p. 273

²⁵ Sloterdijk, Peter. 2013 (2009). "Cur Homo Artista – On the Ease of the Impossible," p. 199

²⁶ Schwartzman, Leslie. 2010. "Transcending Disciplinary Boundaries: A Proposed Theoretical Foundation for Threshold Concepts," pp. 32-33

A pedagogy for uncertain times has itself to be uncertain. It is open, it is daring, it is risky, it is, itself, unpredictable... A pedagogy for uncertainty will be ontologically disturbing and enthralling all at once. It will be electric, as one move sparks another and in unpredictable ways... This pedagogy is a form of restrained anarchy; even a disciplined anarchy – with its spaces and its risks.²⁷

Terms for recognizing unstable states of learning do exist within education theory. 'Transformative learning,' for example, was coined by Jack Mezirow in the 1970s, and has later been explained to involve the experience of "... a deep, structural shift in the basic premises of thought, feelings, and actions ... a shift of consciousness that dramatically and irreversibly alters our way of being in the world." The notion of 'threshold concepts' has, primarily by Ray Land and Jan H.F. Meyer, been developed to facilitate the understanding of these shifts, or learning experiences "from which a new perspective opens up, allowing things formerly not perceived to come into view." Threshold concepts are conditioned by the idea that learning happens in liminal phases (the Latin word *līmen* means 'threshold'). Learning thresholds are described to be *transformative* because they lead to perceptual shifts, *integrative* because they make persons connect phenomena they had previously experienced as isolated, *irreversible* because they leave deep traces which will be difficult to unlearn or forget, and *troublesome* because they disturb a person's worldview (and forces her to think).

Learning and education – a challenging combination

Discussing uncertainty in learning processes is one thing, including uncertainty in educational systems – where assessment of results is required – another. If the unstable liminal spaces are important for learning, and therefore should be acknowledged both by the learner and within the curricula, Land and Meyer (2010) ask, how can they be identified and evaluated?³¹

The architectural education is constituted by agreements on what an architect has to know to be able to practice her profession; it is thus affected by attempts to create quantitative methods of evaluation. This might lead to that immeasurable aspects of architecture are considered insignificant. If phenomena like emotion and embodiment are left out from the representations made in the architectural education, they will most likely be marginalized in the professional practice of architecture. The acts when conceptual ideas are translated into representations and into built structures constitute a core rhythm in the architectural education. Those acts, which might perhaps be characterized as liminal situations or events, stand for a search for truth in the sense that they strive to make concepts meet matter. However, these events are not always leading to measurable results. If their importance is not discussed, they might be given less space within curricula, with the possible consequence that architecture students mimic signs (representations) of what architecture is – absorb an efficient manner of being an architect – rather than experiment with architectural ideas and how they can become present.

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²⁷ Quote from: Barnett, Ronald. 2007. *A will to learn: Being a student in an age of uncertainty*. Buckingham: Society for Research in Higher Education and Open University Press. p. 137. In: Land, Ray and Meyer, Jan H.F. 2010. "Threshold Concepts and Troublesome Knowledge (5): Dynamics of Assessment," p. 72

²⁸ Quote from: O'Sullivan, E.V., Morrell, A. and O'Connor, M.A. 2002. *Expanding the boundaries of transformative learning: Essays on theory and praxis*. New York: Palgrave. p. 11. In: Meyer, Jan H.F., Land, Ray and Baillie, Caroline. 2010. "Editors' Preface: Threshold Concepts and Transformational Learning," p. xiii

²⁹ Meyer, Jan H.F., Land, Ray and Baillie, Caroline. 2010. "Editors' Preface: Threshold Concepts and Transformational Learning," p. ix

³⁰ Ibid, pp. ix-xi

³¹ Land, Ray and Meyer, Jan H.F. 2010. "Threshold Concepts and Troublesome Knowledge (5): Dynamics of Assessment," p. 61

Within his theory of transformative learning, Jack Mezirow introduced a term rather similar to the idea of threshold concepts; that of 'perspective transformation.' Perspective transformation is about changing one's perception of something. Meyer et al (2010) point out that Mezirow's perspective transformation is conditioned by rational and analytic drives for critical reflection.³³ As an alternative, Meyer et al mention an approach to learning thresholds based on depth psychology and developed to balance "rational reflection with an emphasis on affective processes."³⁴ Little research on threshold concepts within artistic educations has been done.³⁵ There is one recent PhD thesis on thresholds within design education: Jane Osmond's *Identifying* Threshold Concepts in Design (2014). Osmond identifies "at least one" important threshold concept within the industrial design education: "... the toleration of design uncertainty – which underpins the confidence to challenge design conventions and thus conceptualise new solutions."³⁶ To find methods for making design students dare to stay in modes of uncertainty is thus a challenge, which may lead to an increase of criticality within design practices. For further research Osmond proposes studies of how variations in student understanding can be measured.

As mentioned above, threshold concepts are linked to the notion of liminality. Learners move in what could perhaps be called an expanded boundary zone, where they pass through preliminal (provocing), liminal (reconstitutive) and postliminal (consequential) stages in their strive to know more.³⁷ Although each learning process is specific, the stages might in course designs constitute a background against which learners can be assessed. 38 Land and Meyer (2010), furthermore, propose a conceptual framework through which learners can be made aware of their whereabouts in the transient state of learning. The framework has three elements and should ideally be adapted to each individual learner: the Signification or pointing out of specific learning thresholds, the Stimulus – a (tangible) mechanism that makes the issues of the threshold workable, and the *Protocol* for the learning process where the 'rules of the game' are set.³⁹

Learning by acting in space

Making a play and making an architectural design have always seemed like the same things to me, an organizational structure that inflects actions, form, text. 40

Within the architectural education, how could learning as an event or liminal space where encounters are enabled, be disclosed and assessed? I have mentioned the proposal that experiences and interpretations of built architecture from the past can trigger learners to desire volatile situations, where they themselves can experiment with architectural experiences. If general solutions to how architecture is made and represented are to be questioned, and events with uncertain results staged, every step will require presence and frameworks like that of significations, stimuli, protocols – if they are applied – will be constantly negotiated. I propose

³⁴ Ibid, p. xii-xiii; referring to the following works by Boyd and Boyd & Myers: Boyd, R. D. 1989. "Facilitating Personal Transformations in Small Groups: Part 1." In: Small Group Behaviour, 20 (4), pp. 459-474.; Boyd, R.D., ed. 1991. Personal Transformation in Small Groups: A Jungian Perspective. London: Routledge.; Boyd, R. D. and Myers, J. G. 1988. "Transformative Education." In: *International Journal of Lifelong Education*, 7 (4), pp. 261-284. ³⁵ Ray Land in conversations with the TRANSark team, NTNU. Trondheim, January 29, 2015.

³² Meyer, Jan H.F., Land, Ray and Baillie, Caroline. 2010. "Editors' Preface: Threshold Concepts and Transformational Learning," p. xii

33 Ibid, p. xii

³⁶ Osmond, Jane. 2014. *Identifying Threshold Concepts in Design*, p. 44

³⁷ Meyer, Jan H.F., Land, Ray and Baillie, Caroline. 2010. "Editors' Preface: Threshold Concepts and Transformational Learning," pp. xi-xii – on stages of liminality, see also footnote 42

³⁸ Land, Ray and Meyer, Jan H.F. 2010. "Threshold Concepts and Troublesome Knowledge (5): Dynamics of Assessment," pp. 61-62 ³⁹ Ibid, pp. 65-67

⁴⁰ Easterling, Keller, interviewed by Mason White – Urban Slot Machine: A conversation with Keller Easterling: http://archinect.com/features/article/41816/urban-slot-machine-a-conversation-with-keller-easterling

that the understanding of learning as transformation and liminality can be related to the making of concrete space, and that this connection is conditioned by the acknowledgment of the learner/architect as an embodied mind.

Let us therefore turn to theatre studies, for another perspective towards liminal spaces, or events. Erika Fischer-Lichte (2008) writes what she calls a new aesthetics – the aesthetics of the performative. She sees the power of that which cannot be fixed; the materiality of the artistic performance is temporary, and yet she proposes concepts through which performative spaces can be analyzed and developed. Fischer-Lichte understands the artistic performance as an event set up to create a spatiality of more or less unpredictable sequences of liminal situations where what we think we know becomes strange: "By transforming its participants, performance achieves the reenchantment of the world." Hence the performance could perhaps be said to be an aggregate of transvaluations.

To see the human being as an embodied mind is a condition for the performance as event. In a traditional theatre play, says Fischer-Lichte, the intellect controls the body – actors read a manuscript with a fixed meaning and spectators watch from a fixed distance. In the performance, in contrast, actors and spectators actively engage as embodied minds, with the consequence that roles, meanings and spatial relations constantly change.⁴⁴

Within architectural history, Fischer-Lichte suggests, the "architectural-geometric space" of the theatre building is discussed, while the "performative spaces" created temporarily within the theatre building have been largely forgotten, and should become a matter of concern. The performance, she argues, "generates and presents" ... a "specific materiality" constituted by four parameters: corporeality, spatiality, tonality and temporality. Taken together they establish a state of "perceptual multistability," an event. The human body – the *corporeality* of being – is by Fischer-Lichte understood as a piece of material or a site, which becomes and appears throughout the performance. Spatiality, she continues, appears during the performance, and then vanishes. Lights, movements, objects, noises, etc., change the performative space, while the geometrical space stays more or less the same. The sounds and silences – the *tonality* – of the performance can be used to play with distances and meanings. Temporality is a condition for the performance, not a part of its materiality. Fischer-Lichte describes how working with

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⁴¹ Fischer-Lichte takes a stand for that documentation of artistic performances is possible against, among others, Peggy Phelan. See: Fischer-Lichte, Erika. 2008 (2004). *The Transformative Power of Performance: A new aesthetics*, p. 75 ⁴² 'Liminality' is central for Fischer-Lichte's performative aesthetics. The origins of 'liminality', as described by Fischer-Lichte, were in ritual studies and more specifically in the analysis *The Rites of Passage* (1909) by Arnold van Gennep. It was based on this analysis of transitional rituals that the anthropologist Victor Turner later coined the notion of 'liminality.' (Fischer-Lichte 2008 (2004), p. 174). Here follows a juxtaposition of two different descriptions of the liminal stages, 1. by Land & Meyer regarding learning thresholds (see "Figure 1. A relational view of the features of threshold concepts." in Meyer et al (2010), p. xii) and 2. by Fischer-Lichte regarding artistic performances (2008 (2004), p. 163):

preliminal 1. *instigative* encounters with troublesome knowledge; 2. autopoietic stage when performance emerges **liminal** 1. *reconstitutive* phase featured by discarding and integration; 2. the performance changes because binary oppositions (boundaries) are overcome

postliminal 1. *consequential* phase of transformation, irreversibility, crossed conceptual boundaries, changed discourse; 2. the performance participants are transformed

The three stages of liminality are complemented by another mode of variation, says Land and Meyer – the *subliminal* "level of tacit knowledge of an 'underlying game' or a 'way of knowing' (episteme)." (Meyer et al (2010), p. 63)

⁴³ Fischer-Lichte, Erika. 2008 (2004). The Transformative Power of Performance: A new aesthetics, p. 181

⁴⁴ Ibid, chapter 3: pp. 38-74

⁴⁵ Ibid, p. 107

⁴⁶ Ibid, p. 75

⁴⁷ Ibid, p. 147

⁴⁸ Ibid, p. 94-100

⁴⁹ Ibid, p. 130

⁵⁰ Ibid

temporality can disturb the audience's habits of order and maintain their perceptive attention.⁵¹ Land and Meyer (2010) also note the potential of temporality, in their case as an underlying parameter regulating learning processes and course designs.⁵²

The performative space does not define what will happen, but provides possibilities.⁵³ It is a "space between" imagination and reality, representation and presence, which can be changed by and change the individuals in it.⁵⁴ Presence and representation have been seen as opposites, says Fischer-Lichte – presence belongs to immediacy and is often preferred over the mediated access to the world that the representation renders. However, she argues, a clear division between what is represented and present cannot be made in the performance's multistable state of perceptual shifts.⁵⁵ While the representation of something overwhelms the spectator less often than its present being, it is needed to create the active liminal states of movement between the new and the known.⁵⁶ But because of its nature of change, the performance can never, according to Fischer-Lichte, be completely understood, and it is thus hard to evaluate.⁵⁷

When acting within architecture, the architect interprets the existing in order to transform it. In between habits commonly affirmed as valid, she can find possibilities to test what appears as given and learn something new about herself and the world. What if the concepts Fischer-Lichte formulates – corporeality, spatiality, tonality and temporality – and how these four develop in the liminal stages of the performance as event could be used to stage experiments within the architectural education? The studio becomes in-between reality and imagination, architecture is simultaneously made present and represented.⁵⁸

Architecture and the potential of uncertainty

A building from the past, a liminal space of learning, an artistic performance – all of these may, as the theories mentioned in this paper indicate, be known as events, or dynamic situations where matter and thought interact. Architecture has concrete conditions – forces, materials, bodies; it works with these conditions in order to shelter humans. Moreover, humans express themselves and their relations to the context they are in through architecture. Architecture is an art able to embody and provoke criticality within society. It is therefore, I believe, important to train architects to challenge the boundaries of architecture. The philosophical ideas and educational theories concerning learning as a strive towards questioning what one knows make it possible, I have argued, to formulate reasons for acknowledging liminal situations of uncertainty within architectural design processes. Seen as spaces for critical making and thinking they may be regarded to be essential in the architectural education. Developing the discussion about them

⁵¹ To make performance participants aware of time's passing, and turn their attention to "... the phenomenon of emergence, a temporal organization that supports a causal chain of events or reasoning becomes irrelevant." To release the performance from narrative, time brackets (for example in John Cage's 4:33) can be used to define its beginning and end. Rhythm is a more fundamental parameter of the performance, described by Fischer-Lichte as an organizing temporal principle based on the circulations, movements and beats of the human body, a principle which sets "corporeality, spatiality, and tonality into a relationship with one another and regulates their appearance and disappearance in space." (Fischer-Lichte. 2008 (2004), pp. 130-136)

⁵² Land, Ray and Meyer, Jan H.F. 2010. "Threshold Concepts and Troublesome Knowledge (5): Dynamics of Assessment," p. 67. On temporality and architectural education see, for example, C. Greig Crysler's article "Times Arrows: Spaces of the Past," in which he concludes a discussion about temporality in architectural theory and education by saying that "... a politics of architectural knowledge involves not only questions of space, but also those of time, and the often overlooked presumptions that inform its representation." (Crysler et al 2012, p. 305)

Fischer-Lichte, Erika. 2008 (2004). The Transformative Power of Performance: A new aesthetics, p. 108

⁵⁴ Ibid, p. 114

⁵⁵ Ibid, p. 147

⁵⁶ Ibid, p. 150

⁵⁷ Ibid, p. 40

⁵⁸ I would like to create educational events within the Master studio *Making is Thinking* at the Faculty of Architecture and Fine Arts, NTNU, and with one of the studio's collaborators: *Cirka Teater*, an experimental theater company based in Trondheim. (Making is Thinking: http://www.ntnu.edu/transark/wp1; *Cirka Teater*: http://www.cirkateater.no).

might, I propose, make them acknowledged as knowledge producers which should be possible to include and evaluate within educational systems.

With references to ideas from Nancy Stieber, Michel Foucault and Friedrich Nietzsche, I have aimed to establish the argument that architectural history holds suppressed potentials which if they are disclosed may contribute to critical thinking and making within architecture. Additionally, I have introduced thoughts from Gilles Deleuze and Peter Sloterdijk on learning as a dynamic movement simultaneously making the world understandable and changing it. If history and architecture are approached as contexts to live and work within, emphasis can be put on learning through these contexts rather than knowing things about them. From theories of education formulated by Ray Land, Jan H.F. Meyer and others, I brought in the terms 'transformative learning' and 'threshold concepts.' These terms aim to make learning as a liminal activity recognized as an essential and assessable part of higher education, hence they are possibly useful if one wants to argue for the need of critical knowledge production within the architectural education. Moreover, attempting to link ideas of learning and liminality to architectural making, I have suggested that Erika Fischer-Lichte's aesthetics of the performance offers a volatile system where ideas and matter meet. Her ideas could, I think, inspire architects to let the presence of the human body and representations of (actions in) space inform and affect each other dynamically in educational events. Fischer-Lichte's conceptual framework in combination with that presented by Land and Meyer might perhaps, I propose, support educators who want to encourage architecture students to stay in uncertain spaces of learning, where intriguing and new possibilities of architecture are likely to emerge.

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