The necessary shift from behaviourism to transactional constructivism education e...

Education

IMPLICATIONS FOR DESIGNING SUSTAINABLE SCHOOLS TO ACT PEDAGOGICALLYAfter spending a few days in each school, talking to the pupils, teachers, and architects, after reflecting on that experience and analysing the data gathered, a myriad of relationships emerged linking the sustainable school design and its impact on the learning. Besides, I believe there a few more broader messages emerged. Theoretically framing could illuminate our decision making in the future and help us design more pedagogically potent schools. Doing so is crucial because it was clear that the gap between planned space, lived experience and the learning outcomes does exist (other studies confirm this, see Boys, 2011). According to the conclusions made in the analysis (see p.) some of the reasons for this were the lack of deeper understanding how teachers and pupils see and define school space, and how they value the pedagogical potential of its aspects. This research, along with the others presented in the literature review, shows that architects so far produced a wealth of interesting school designs, aiming for them to be used as teaching and learning tools and raise awareness of sustainability issues. Yet, the idea that the schools can act as the third teachers is still under researched and poorly theorised, particularly in the arena of sustainability. Hence, all interested in this topic must venture into adding to the discussion. This is the only way to establish and develop guidelines and principles, and build an extensive body of knowledge on the matter. Additionally, it can bring us a step closer to a broader and more holistic understanding of the pedagogical potential of sustainable schools. Therefore, this research proposes to look at: The shift from behaviourism to transactional constructivism, A changed and expanded understanding of

what sustainable school ‘ space’ is, A proposition for a better model to define and examine ‘ the space’ of a sustainable school, A proposal to understand how pupils learn and establish critical relationships from experiencing places, andA suggestion to understand how pupils derive meanings and establish emotional relationships from experiencing the place of a sustainable school.

The necessary shift: from behaviourism to transactional constructivism

If we want to increase the pedagogical potential of sustainable schools, we must change the way we understand both the learning process and the environments in which this process occurs. In other words, we must radically depart from the simplistic behaviourist stimuli-response approach. In the last ten to fifteen years such efforts could be observed in both fields – the field of learning theory and the field of architectural theory. These and similar ideas are beginning to penetrate the area of sustainable school design, so we can begin to embrace the transactional model of learning and designing sustainable schools. The learning process, as well as the learning environments, have long been observed through the lenses of behaviourism theory (for example see some of the main behaviourist theoreticians such as John B. Watson, B. F. Skinner or Ivan Pavlov, or comprehensive review by Baum, 1994). This theory delineates behaviour as an individual response to the stimuli in the environment. In this case students are seen as " empty vessels" to be filled with the knowledge from the teacher. Traditional classrooms with rows of chair and tables facing the teacher is the traditional architectural response to this paradigm. Even today this trend is present and could be observed in many architectural studies. In them architects describe

the intentions behind various designs, assuming that specific design will result in a multitude of effects (Boys, 2011). This study also confirms that this approach is still alive. For example, in Silverdale school in Sheffield a part of the building was covered with the green roof which, except enhancing and encouraging habitat creation and balancing the building temperature, was intended to be a learning tool. Unfortunately, during the study only one student was aware that the green roof even exists. Clearly, providing a certain space or features, and assuming that pupils will learn is flawed because environmental stimuli does not always produce wished learning or behavioural response. The problem with this concept is that students are seen as passive and environments as active factors in the learning process (Lippman, 2010). The environment can indeed have an effect on the learning process and behaviour, but there is a myriad of other complex variables that must be taken into account. Learners and learning environments are endlessly informing and influencing each other (Barker, 1968; Boys, 2011), thus, the relationship between the learners and the learning spaces does not follow this deterministic pattern. Some other architects and researchers have tried to move forward considering constructivists theory (for example see some of the main constructvists such as Dewey, J.; Montessori, M.; Paget, J.; Kolb, D,; von Glasersfeld, E.). This theory puts the accent on exploratory action learning and learners' activities. Learners engaging in the built and natural environments, through mental activities, construct the knowledge (von Glaserfeld, 1995). Learning is not a straightforward stimuli-response situation, but a cyclical process of inspection, reflection, and abstraction (Kolb, 1984). As opposed to behaviourism the environment is here seen as

passive, and the learner as active. The problem with this approach is that it does not address the issue of how learners learn in specific social and physical contexts, and how both the participants and the learning are transformed through that process (Lippman, 2010). Social constructivism goes a step further, and acknowledges the significance of social encounters for learning. Building on the work of Vygotsky`s theory of proximal development (Vygotsky, 1978) social constructivism stresses the importance of the culture and the context in which the learning occurs and denotes pupils and teachers in the process of creating and constructing new meanings (McMahon, 1997). Learners do not just learn from experience, but they also learn from the perspectives of others through discussing ideas, opinions and beliefs. From these social interactions learners make sense of the problem and new concepts emerge (Mayer, 1996). Architects today have been trying to design spaces that support informal social interactions within learning environments. Alcoves, benches and tables alongside corridors, and in multi-functional spaces, such as the ones in in Erika Mann school and Silverdale School , present an opportunity for learners to bump up against each other, stop, talk, exchange ideas and observe each other`s behaviours and attitudes. Today we understand that learners and learning processes are inseparable and embedded in the physical and social contexts in which the learning occurs and which the learners occupy (Altman, 1992). This transactional constructivist view suggests that pupils do not passively respond and adapt to various environmental influences, but they actively engage in `reading` environmental messages. This process of experiencing and reading places is " facilitated within physical, social, and cultural

contexts where all the objects and events have specific meanings that are socially constructed as well" (Lim and Barton, 2010, p. 329). Clearly, a transactional model puts equal emphasis on the participants, the context and the process of transaction (Matthews, 1992). Interestingly enough, much contemporary architectural " theory" stresses the same three aspects: the context, the participants, and the activities when defining space. Architects and critics advocating this idea have been arguing against representation or image-based architecture (Koolhas, 1997; Tschumi, 1994, 1996). This means that architectural space should not be seen as a static setting, because meaning making is not the result of just what we see in space. As Boys (2011, p. 28) explains " spaces are not just settings in which behaviours are produced, but are understood as inherently performative and events based". In other words we should speak of architecture – as an event, instead of architecture – as an object (Tschumi in Boys, 2011). Architectural space should be seen as a process, where " meaning making" occurs through our cognitive interactions with its physical and social aspects. Taking this into consideration, the learning process, as well as the sustainable learning environments must be seen as continually evolving constructs, dependent on the transactions between location or context, actors and their activities. Observing the learning process through the prism of transactional constructivism and framing the space in which it occurs as event-based directly implies that the way we comprehend the spaces of sustainable schools must be changed. If both the learning process, and experiencing and reading space, are defined by using the same three aspects: the social and

physical context, the activities and the participants, could we then tautologically conclude that experiencing spaces means learning?

From sustainable school space to sustainable school place

" Places are sensible, alive, active and animate and with all their characteristics, they are able to enter into a relationship with the human beings." (Merleay-Ponty, 1962)The space should be distinguished from the place (Malpas, 1999). Spaces are physical locations that could be easily found on the map. Providing only guidelines for dimensioning space, calculating the necessary energy reduction by employing specific technical equipment and construction features, many sustainable school building guides, standards and propositions treat the sustainable school space as Euclidean, mathematical and geometric space. Places, on the other hand, imply character, emotional attachment, sense of belonging, or people-space relationships. Places are transformed into spaces through human presence (De Certeau 1984, p. 117). Thus, sustainable school environments should not be seen as a final products or objective phenomena, but they have to be read, interpreted and (re)constructed by their occupants. 1 I believe that the extent to which sustainable school places are able to stimulate and encourage a multitude of interpretations and readings, is linked to their pedagogical potential. In order to engage with occupants, and better understand their interpretations of the space, a new model for exploring, comprehending and designing sustainable school spaces should be proposed.

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1 Matthews (1992) suggests that " environment is not an objective phenomenon, it is interpreted and reconstructed through personal, cultural and social lenses and the outcome is never a copy"

Dynamic location-actors-activities model: a better way for understanding sustainable schools

To construct and examine the transactional relationships between sustainable learning environments, their occupants and activities within them, dynamic location-actors-activities model will be presented. This model was derived taking into account the various aspects the participants in this research used to describe important aspects of successful and inspiring learning environments: the people (for example see p.), the physical environment (), and the activities (). In order to theoretically frame this model the literature was explored and concepts emerged, which could aid its better understanding. The dynamic location-actors-activities model implies that sustainable school space should not be seen as just a physical entity. Instead, it should be understood as a situated practice which can never fully exist without its occupants, their activities, and the context in which they are immersed and in which they operate (Fig. 5. 1.). Observing the space through such a trinary system is not a completely new thing. Long ago Lefebvre (1991) proposed a `spatial triad`, as a better method for observing and analysing space. This method analyses the complexity of a space by considering its three aspects: social and spatial practices, the design of the environment, occupants` perceptions, engagements, and adaptation of both practices and design. Yet, sustainable school space observed through such a

trinary system is not a static and a stabile construct. It is rather a dynamic assemblage, consisting of all the previously mentioned aspects (‘ Assemblage’ theory developed by Deleuze and Guattari, is rather a theory of society than of place. Yet, paired with Dovey`s application for understanding space could indeed be theoretically and practically useful, aiding our understanding on the matter). Additionally, not all the actors, engaging with a place will read the same messages and learn in the same way. A useful concept that certainly fosters our understanding of the pedagogical significance of the person-environment relationship is Gibson`s (1979) concept of affordances. The author explains that affordances are " functional possibilities of the environment in relation to a person" (Gibson, 1979, p. 129). What is more, affordances are always context specific, different and unique for each individual and a specific group of people. This means that developmental opportunities of a certain environment are simultaneously determined by its physical and social characteristics, as well as by the characteristics of a particular individual (Heft, 1988). Lastly, the way acquired knowledge will be distributed in that learning community depends on the relationships between the people, their common goals and interests, and their regular interactions in order to exchange work, experience and insight (Wegner, 1998). 2Clearly, the pedagogical potential of sustainable school buildings must be developed considering learners, learning process and learning environment as dynamic systems embedded one within another (Lippman, 2010). Though, comprehending the sustainable school space is not enough. Equally important questions, that must be tackled, are related to

understanding how people learn from experiencing learning environments, and what might be the important steps on the way.

Learning from experiencing the sustainable school environment

" Places teach us who, what, and where we are, as well as how we might live our lives."(Gruenewald, 2003, p. 636)The greatest problem of contemporary standardised and globalised education is the fact that it " essentially dismisses the idea of a place as a primary experiential or educational context" (Gruenewald, 2003, p. 7). Contemporary school architecture demonstrates the same trend by divorcing pupils and teachers from their local context, by the lack of awareness, connection to and appreciation for the context from which it emerges. If we want the school architecture to act pedagogically and empower pupils, teachers, and local community members to actively engage in designing their sustainable future, it has to address the specificities of the local " experiences, problems, languages, and histories" (McLaren & Giroux, 1990, p. 263) and emerge from the specific contextual attributes. As Gruenewald (2003) propses the critical pedagogy of a place must be embraced. The way humans experience places is " profoundly pedagogical" (Gruenewald, 2003, p. 619). Places teach us and places make us. Places constitute the centres of our experience, demonstrate how the world works and define our position in that world. From direct experience with a place humans are able to learn (Weinstein and David, 1987). To what extent the places will be successful `teachers` depends on the attention we give them and our understanding how places we inhabit shape our knowledge (Gruenewald, 2003).

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2 Leave and Wenger`s (1991)

Establish critical relationships: important steps on the way

Every learning starts with perception (Lippman, 2010) (Fig. 5. 2.). Being attracted to a certain feature, situation or opportunity pupils will start to actively explore all the learning possibilities through various activities. Stimulating exploration and play within certain learning environment is crucial as they present a way of getting familiar with a place, they are energisers that support mastery of environments (Matthews, 1992), they can increase place knowledge, and the acquisition and integration of that knowledge (Spencer and Blades, 2006). Such engagements are vital as they present a form of thinking through doing, they are " a part of an ongoing creative process of intersecting of what is known with what is not, so as to investigate what might be" (Boys, 2011, p. 34). Engaging in various activities, around various design features, and successfully completing them, pupil`s confidence could be increased. Through this active process of problem solving activities, pupil`s gain important knowledge which can turn them into skillfull, capable, strategic, competent, confident explorers, and participants in their school space (Lim and Barton, 2010). Playing with what they learned, and trying out new ideas pupils, they could easily master the certain situation at hand, and start looking for new opportunities. As they grow and develop school design must allow new place experiences and opportunities to emerge. In this way the occupants, the activities and the environment will reform each other perpetually (Brandt, 1994). Whether we would like to stimulate the learning about energy saving issues, or support

the development of a sense of community and group cohesion, the role of sustainable school design is very important, as it has to present a sort of environmental provocation. First, the design has to be intriguing, stimulating, imaginative and at the same time clear and transparent, in order to attract pupils' attention. The design should neither be overly- complex nor too mundane. If the design is too simple pupils could easily lose interest, or if it is too complex it might scare them away. Additionally, easily recognisable and pre-labelled spaces could present a danger to students as they could " fall into standard assumptions about their place as a passive rather than active learners" (Boys, 2011, p. 46). Pupils may even prefer familiar places as they present something already known. On the other hand, changing the standard routine of the space use may undermine pupil`s confidence. Sometimes knowing " when to leave the space more ambiguous " is crucial (Lawson, 2001, p. 225). Obviously, familiarity as well as novelty of design features, and they way they are distributed across the school can either provoke or inhibit pupils` exploration and learning (Hart, 1979). Furthermore, it must be stressed that the process of experiencing the learning environments, thus learning from it, must be seen as, dynamic, in-action (Graumann, 2002) continually progressing and evolving over time. As pupils and teachers, are always learning and changing, their relationships with the learning environment is also dynamic. This is another reason why the physical environment of sustainable schools must have the capacity to grow, to be modified and adapted according to activities and participants, in other words it must be able to promote the flow of the learning. Places have to enable different relationships to emerge and different learning experiences

to be accommodated around activity settings. Physical elements of space, such as furnishing and equipment, could be used to promote or discourage encounters depending on the learning activity. For example sociofugal arrangements support individual work, while sociopetal arrangements encourage social activities and group work (Osmond, 1966). Moreover, no matter how competent and experienced the architect is, he/she can never anticipate all the teachers` and pupils' needs and intentions. Hence, adequate empty spaces, unfinished spaces with some loose parts must be left as they enable new learning spaces and activities to be created. Approaching the problem of designing sustainable schools in this manner, means acknowledging the fact that the physical environment can " frame or invite behaviour" (Lawson, 2001, p. 225) but never totally influence and determine it. Embracing the transactional approach to sustainable school design, we could foster the creation of critical occupant-place relationship. Without critical relationships occupants will not engage, explore and transform their places, learn from those engagements and develop the places over time. Consequently, the pedagogical potency of a sustainable school place could be seriously undermined.

Establishing emotional relationships: deriving meanings, attachment and identity

" Places are infused with meaning and feeling."(Rose, G., 1995, p. 88)Experiencing sustainable school space does not present just a learning process. Interacting with physical, social, and afterwards symbolic and imaginary features of a space pupils derive important meanings and construct and cultivate identity on several levels: personal, group, school,

and community. Participation with peers and teachers in various activities in a certain context helps meanings to be created, recreated and endorsed. This process presents an opportunity for occupants to " develop understandings about themselves and their social environment, … and their identity" (Lippman, 2010, p. 21). For this reason we should not think that the sustainable school environment consists of only spatial and design attributes, but of meanings as well. Therefore, we must consider how the sustainable school space cultivates meanings derivation and identity formation, because exactly meanings and identity in turn impact how occupants make sense and give significance to their environment (Matthews, 1992). The architecture of a sustainable school must be developed to sustain, not just previously mentioned critical, but emotional and affective relationships with its occupants. Without emotional attachment occupants will not be attached to, thus care for their learning environments, and care is a prerequisite for the sustainable development. If we once again frame the sustainable school place as a " series of situated, interpretative experiences" (Boys, 2011, p. 109), it is proposed that for sustaining such experiences over time creative polemic (Christensen et al, 2000.) between occupants and sustainable school space must be allowed. Shared experiences, meanings, and later on memories, created as a result of this polemic, could become jointly made place identity that can reinforce important sustainability messages. Metaphors as central, though not often explicit, aspects of architectural design seem to be a good basis for pupils, teachers, and architects to engage in the discussion about school space during the design process, as they present a kind of common language (Jamieson, 2008). Later

on organising parts within an ordered main theme, or metaphor, is one way how the identity of a place could be created by using the design concept (Wolfe and Rivlin, 1987). Using metaphors in this way can be indeed powerful, but dangerous tool as well. Metaphors and themes have to be interpreted and translated into an actual school design without treating architecture as image based, avoiding well recognized convention. To illustrate, if pupils during the participation process expressed the wish to have a wood-like school this should by no means mean painting trees or glueing up posters of threes on the classroom walls. Seeing architecture as performative and event-based, implies that interpreting phenomenological aspects of the `learning in the woods` story (for example leaves falling in autumn, bending branches under the heavy wind, etc.) would probably be a much better approach. Additionally, in order to enable affective engagements architecture of sustainable school must be developed to engage all senses. Using their own senses occupants can experience various physical and social qualities of the school space, turning the physical space of the school into the " lived" one (Soja, 1997). By moving around, seeing, smelling, touching and hearing pupils explore the space, acquire, process and structure environmental knowledge, test spatial, bodily and cognitive boundaries, and communicate. When all five senses are engaged, they can reinforce each other, dramatise spatial experience and provide emotion-charged environment (Tuan, 1977). In other words, sensations and movement stimulate pupils to feel, receive and respond (Wolfe and Rivlin, 1987). Additionally, such experiences give possibility to pupils to connect the real world with the world of imagination, material aspects of the place with

the symbolic (Mathews et al, 2000) and serve as a mean of transportation from " boring ritualised life in school to their magic world" (Spencer and Blades, 2006). These personal, " magic worlds" enable pupils to call a school place their own. An environment that allows and invites to be sensory experienced carries subjective and personal meanings, and enables important affective engagements for occupants. Moreover, engaging in and with such a sensory space pupils name them, tell stories about the, that is to say, use words which have the power to render objects and impart a certain character to them (Fig. 5. 3.). As Tuan explains (1991, p. 684) " when it is named – a place promises to open up to other places". This is because naming means recognition, communication and claiming territory (Ashworth and Graham, 2005), it is a way to distinguish a place from a larger whole, and the most importantly is one of the basic steps in the construction of place identity. By naming a certain place, that place becomes personally significant for a child. On the other hand, as children tell each other these names, part of their space becomes shared in meaning (Hart, 1979). Names that children assign to places are directly descriptive or functional (Hart, 1979). For example, in die Bauplioten school they are derived from the participatory design process with pupils. The name of the spaces around the school are a kind of poetry around which different stories and tales are woven. Stories, beside names can convey the relationships between school, occupants and their identity (Cronon, 1992), and they have the power to tell everyone what they and their community stand for and are indispensable pedagogical, socialization, inclusion and integration tools. In turn these stories influence how children learn, interact and make sense of a place.

Attachments, meanings and emotions derived from environmental experience with a place can be so strong and form the central part of the identity of the people having the experience (P. 88 rose, 1995). It is because " part of how you define yourself is symbolized by certain qualities of that place" (Rose, 1995, p. 89). What is more working and interacting with each other, as well as the physical elements of a learning environment , pupil's identity is formed and transformed (Proshansky, Fabian; Lippman, 2010, p). Through this process pupils are not just developing their own identity, but are participating in developing identities of their peers, identity of the group and identity of the school space (Lippman, 2010). The relationships between the pupil and other people in school and objects impacts how the pupils defines him/herself and the environment as well (Weinstein and David, 1987). In this way place-identity impacts self-identity and vice versa (Proshansky et al, 1983). Discussing place identity we must bear in mind several important aspects: place identity is created by both individual and by groups (Allen and Massey, 1995, p. 55); it is not universally shared and unique concept (Proshansky et al., 1983) and outsiders can have very different interpretations; contextual variables (social, economic, cultural) impact identity making (Matthews, 1992; Rose, 1995); andpeople, places and identities are ever-changing (Lim and Barton, 2010). This suggests that occupants` lived experience, feelings and meanings are different. Through the time these experiences, feelings and meanings are accumulated embracing the past and present. Hence, place identity should be seen as a " potpourri of memories, ideas, feelings, attitudes, values, preferences, meanings, and conceptions of behaviour and experience"(Proshansky et al.,

1983, p. 59). This potpourri is in flux, constructed and deconstructed over and over again within places by various participants (Fig. 5. 3.). Therefore, identities are neither fixed or given, nor ascribed, but negotiated between multiple places and multiple participants (Malone, 2007). For all of these reasons space does not have a single reading, and it does not represent just a single thing. Developing the design of a sustainable school as transactional, that enables a multitude of readings, could sustain the affective and dynamic occupant-place relationships over time, out of which personal and place identity could spring. Furthermore, pupils spend days and years in schools and it is to be expected that if places allow to be experienced by the mind, body, and soul, the meanings derived from that experience will " rub off on personal impressions and moods" (Walden 2009 p. 16). In such spaces pupils could find models for their lives. Exactly this statement should encourage architects to think how transactive design should reinforce important sustainability messages and allow them to develop over time to become main pillars of the school and their occupants identity and ethos. In addition, when a community is also involved in the school design, in the building process (such as doing simple technical work) and later on the school life (see p.), the space created could become an important component of community identity and useful part of an integration strategy. Metaphors, names, stories woven around the school identity can be " powerful expressions of social reality" (Boys, 2011, p. 25). They can present a " communal situation" (Heaney, 1980, p. 148) depicting the condition of the community within the school, and within the local neighbourhood. Indeed, observing the Erika Mann school there is some

symbolic connection between the Silver Dragon and the struggling multinational community trying to counter their problems and reinvent themselves through redesigning and opening up the local school. Designing sustainable school as transactive space " that mixes people of different social identities is in general less likely to reproduce those identities and more likely to promote the new identity formation"(Dovey, k. 2010, p. 110). In this way a sustainable school in a local community" can become the terrain for elaborating strategies of selfhood –singular or communal -that initiate new signs of identity, and innovative sites of collaboration, and contestation" (Bhabha, 1994, p. 1). and a mean " through which multiple and various communities of practice attempt to describe (and stabilise) themselves as having the appearance of recognisable entities" (Boys, 2011, p. 112). Lastly, it must be understood how new coming pupils, teachers, and community members will accept and perceive the sustainable school. As the way occupants make sense of their space is inextricable from the sense of the time, the key to answering this question could lie in seeing identity as a heritage (Ashworth and Graham, 2005). They explain that heritage is tightly related to " material artefacts, mythologies, memories and traditions" (p. 4.). In this process the transactional design of the sustainable school could play the pivotal role. Through interactions with the space, through the way occupants use the space, think and feel about it the shared history is created, and brought to life through the stories occupants tell. In this way transactive school design is the stimulus for creating new meanings, identities and carrier of the shared history of a place, that is to say a witness of the past and a resource for the present. If we want the architectural

design of a school to be embodiment, as well as stimuli for the creation of school identity, it must outgrow and stop being just an " imagery of a design metaphor" because " the representational image necessarily or transparently" does not " translates into an equivalent everyday lived experience" (Boys, 2011, p. 118). When school design is standardised and too prescriptive, spontaneity is lost, and opportunities for creative dialogue with the school space reduced. To what extent a certain school space is sensory engaging, responsive, aesthetically pleasing, provocative, interesting, pleasant, meaningful will determine how the occupants interact with the space and with each other, name their place, and tell stories about these places. Engage and playing with both physical elements mimicking interesting parts of the stories around the metaphor (such as folding and unfolding benches that by the way they are pulled up/down and by the sound they make mimic the flapping of the dragon`s wings in the Erika Mann school) as well as with the ideas behind the design, will help the occupants be active participants in the process of meaning making and identity cultivation, which both are central for affective occupant-place relationship. The identity of such a school as continually evolving landscape, depending on the meaningful and affective relationships between the occupants and their learning environment. The ability of transactive sustainable school design to include its occupants in their joint identity formation and transformation, will have significant impact on to what extent their relationships will be sustained over time.

The main message from the ‘ third teacher’

If we want the sustainable school architecture to act as the ‘ third teacher’, that is to say, be able to impact the learning and development of children, and transmit important sustainability messages, it must be seen as performative and event based. This implies that what a pupil could learn from experiencing environments will neither be a passive transmission of knowledge , nor the active learning proposed by the constructivist, but negotiated process located at the interface between the physical and social context, the participants and their activities. All these components will determine the success of learning from the environmental experience. Designing sustainable schools in his way can support the development of critical and affective occupant-space relationships is crucial " so that the education of citizens might have some direct bearing on the well-being of the social and ecological places that people actually inhabit" (Gruenewld, 2003, p. 3). Additionally, in order to minimise the gap between planned space, design intentions, actual lived experience and learning outcome, we have to unpack the " multiple, layered, and dynamic, components and relationships through which learners, learning, and spaces intersect" (Boys, 2011, p. 117). Exactly for this purpose we must develop better models for understanding and examining sustainable school space. Using the dynamic actors-activities-location construct for observing, analysing and designing sustainable school space might be a step towards that goal. Approaching the sustainable school space with this construct in mind could help us to incorporate the " the principles of sustainable development into the very sense of a place" (Dovey, 2010, p. 105), and acknowledge that school place is in the constant state of

becoming. It seems that the question that requires serious contemplation is how should architects design sustainable schools accepting this " uneven, dynamic, multiple and amorphous character" (Boys, 2011, p. 112). Therefore, designing a pedagogically potent sustainable school placethat can simultaneously support the sense of belonging and push the participants out of their comfort zones, andwhich leaves the opportunity for children, to through acting upon the environment, develop a critical and emotional relationship with it, still remains a radical challenge for architects. In spite of the difficulty of this challenge, we all must venture into offering our solutions. Competent and knowledgeable engagements of children with the school environment do not lead just to intelligent transformations of the environment. They also impact the learning about social and environmental responsibility, and lead to intelligent transformations of the learners themselves (1979, p. 347).