PRE ARCHITECTURA

LEARNING THROUGH SPACE

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Budapest, 2015

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- to the children who helped me learn about space and architecture -

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A Pre Architectura - Learning Through Space / Térbeli Tanulás című kutatás a térbeli érzékelés és alkotás folyamatait, mint a tanulás alapvető formáit vizsgálja, elsősorban a gyerekkori tanulási folyamatokra összpontosítva, de ezek hatásait az emberi élet későbbi szakaiban is végigkövetve.

A kutatás alappillére az épített környezet, mint tanulási felület használatának vizsgálata, amely megszokottságából eredően biztonságos hátteret alkot, amelyben a gyerekek/résztvevők könnyen megnyílnak a tanuláshoz szükséges kíváncsiságnak utat engedve. A környező épített világ térbeli, építészeti, társadalmi, történeti és kulturális rétegeinek köszönhetően végtelen információt és ingert hordoz a különböző minőségű tudáshalmazok és képességek elsajátítására.

Az elméleti megközelítés a térbeli tanulási folyamatokat, mint a többi tanulási folyamat alapját és modelljét adó kezdőpontként közelíti meg, mindezt a filozófia, pszichológia és építészetoktatási kezdeményezések párhuzamos vizsgálatán keresztül, a közelmúlt fiziológiai kutatási eredményeivel alátámasztva.

A Pre Architectura program gyakorlati tevékenységei a tudatos térbeli érzékelés, mint intenzív tanulási esemény és az építés, mint a kreatív problémamegoldás fejlesztését szolgáló tanulási tevékenység párhuzamos fejlesztését szolgálják. A kezdeményezés a jellemzően adat- és megoldókulcs-központú oktatás kiegészítéseként olyan kompetenciák megszerzésének biztosítását teszi lehetővé a gyerekek számára, amelyek segítséget nyújtanak az egyre növekvő információ-terhelés kezelésében és képessé teszik a gyerekeket az épített környezetük mélyebb érzékelésére és értelmezésére, értő használatára és alakítására.

Pre Architectura - Learning Through Space investigates spatial learning processes: spatial perception and spatial creation as fundamental ways of learning, primarily during childhood though with detectable results in all ages.

The research presents the possible uses of the built environment as the base to provide learning opportunities on multiple levels: due to its habitualness, the built environment serves as a safe background, where children/participants open up easily for curious exploration; while due to its spatial, architectural, social, historical and cultural properties, it contributes an infinite range of stimuli to different learning processes.

The theoretical approach of the research considers spatial learning as the basis and model of all learning processes, introducing parallel contemplations of philosophy, psychology, and architectural education initiatives with the supporting results in recent physiological discoveries.

The developed practical methods of the research are based on two processes: conscious spatial perception, as an intensive experience for the learning event; and building, as a learning act to develop creative problem solving skills. The initiative targets the introduction of complementary competences to generally produced data-based knowledge in educational schemes in order to enable children/participants to handle the expanding information load of contemporary society and to empower them to actively participate in shaping their own environment to provide empathic and appropriate surroundings for leading a fulfilling life.

Subject

The Pre Architectura program started as a prototype development of 'architecture education for children' in Hungary. However, due to both the theoretical and practical results en route, the focus of the research moved towards spatial learning processes: space as the elementary component of architecture and the development of human behaviour towards it from perception to creative use. The 'learning through space' methodology embraces the current shifts in educational strategies, providing fundamental learning experiences for further education while particularly improving the human potential and competences instead of professional and factual knowledge.

Learning targets the world with a fulfilling life through better understanding and collecting applicable knowledge for competent answers to the challenges of the surroundings, an approach similar in all sciences and arts. Philosophy enters into this analysis at the foundations of human existence where "The aim of philosophical inquiry is to gain insight into questions about knowledge, truth, reason, reality, meaning, mind, and value. Other human endeavours explore aspects of these same questions, not least art and literature, but it is philosophy that mounts a direct assault upon them...".[1] Space is considered to be the fundamental component and existential necessity of architecture, the thing that is behind all other aspects; therefore, using the methodology and results of philosophy as a foundational act of knowledge seems to be an appropriate approach to uncover the processes behind architecture and spatial perception and action.

Tools

The practical elements of Pre Architectura - architectural excursions, classes, workshops, building camps for children and spatial education facilitators, and the development of the school curricula - played a significant role throughout the research programme. The tasks were introduced to children and tested in elementary schools, museum pedagogy workshops, and summer camps. Many workshops were organised together with MOKKA Contemporary Art Team, integrating different creative and artistic fields into the programme and applying some of their pedagogical methods, and with the Children's House, the largest institution in Győr utilising alternative education for children.

Moreover, the learning experiences throughout these events influenced my teaching methods at university and the building workshops with architecture students. The dialogue between the

[1] *A.C. Grayling: Philosophy 1: A Guide through the Subject. vol. 1. Oxford University Press, 1999, p. 1*

"Nem szükséges különböző definíciókat idézni ahhoz, hogy belássuk: az építészet vizsgálatához a tér filozófiai értelmezése vagy a modern fizika térelmélete alig ad valami segítséget."

Szentkirályi Zoltán: A térművészet történeti kategóriái,
in Válogatott Építészettörténeti és Elméleti Tanulmányok, TERC, 2006, p. 279 [2]

The Fine Art of Doing Without; in White Noise
Why a data-driven society needs more common sense;
Abstract No12, W. I. R. E. 2013 p. 62 [3]
Saint James Pilgrim House,
Pannonhalma, 2010, by CZITA Architects
(Tamás Czigány, Róbert Papp, András Cseh) [A]

John T. E. Richardson: The Concepts and Methods of Phenomenographic Research,
in Review of Educational Research, Vol. 69, No. 1, Open University, 1999, p. 53 [4]

spatial experimentation and building processes regardless of age has been a field of previously unexpected discoveries. However, the detailed introduction and analysis of all of these cases - a strategy that the majority of available domestic and international literature uses - creates an unnecessarily monstrous, repetitive, and sometimes even uninteresting text. Yet the basic knowledge of these personal experiences and the collected data is essential in understanding the process of thought as the exchange between practice and theory has been continuous, and for the most part, productive. Therefore, the dissertation includes illustrations and explanations of the application of the research parallel to the scientific text, leaving the reader a free choice of order either going from the theoretical to the practical or the other way around.

Although this research is based on the experimental Pre Architectura workshops and their reflective theoretical critique, a major unexpected finding significantly formed the course of the research. The dissertation includes numerous citations from philosophy, which might seemingly be far from the spatial playground of children. In contradiction to Zoltán Szentkirályi, who claimed that "the philosophical interpretation or the space-theory of modern physics hardly provides any support to the analysis of architecture" [2], when studying the writings of Plato and Heidegger - especially those discussed during the autumn semester of the Art Philosophy course by Bálint Veres in 2012 at MOME - many observations of the program connected vividly. This occurred either by confirming or questioning my theories with the formations of thought on these philosophical sources, providing the breakthrough in choosing the perspective for the research itself. Further, the actual 'learning by doing' experiences and the contemplation techniques of philosophy are much too similar to ignore as both are based on the triple action of perception of the existing environment on unconscious and conscious levels, purposeful curious discovery, and reaction. Adhering to this approach throughout, the research has been done in complete harmony with Roger de Weck's quote: "There is nothing that is better for you than finding what you weren't looking for." [A, 3]

The process and tools of the work collided with those of phenomenography, which also focuses on the experience of learning rather than learning from a quasi-cognitive-psychological framework. The developer of this research methodology, Ference Marton, described "phenomenography as an empirically based approach that aims to identify the qualitatively different ways in which different people experience, conceptualize, perceive, and understand various kinds of phenomena." [4] At first, this approach lacked proper evaluation; therefore, it was condemned to be unscientific.

John T. E. Richardson: The Concepts and Methods of Phenomenographic Research, in Review of Educational Research, Vol. 69, No. 1, Open University, 1999, p. 53-82 [5]

The Experience of Learning: Implications for teaching and studying in higher education, Part I, Chapter 3, Approaches to Learning by Roger Säljö and Ference Marton, p. 55 [6]

[6]

Nevertheless, John T. E. Richardson provided revision of the research regarding its conceptual, epistemological, and methodological basis[5]. Providing appropriate ground to further apply these findings, let us note the six qualitatively different conceptions of learning by Roger Säljö and Ference Marton:

1. A quantitative increase in knowledge.
2. Memorisation.
3. Acquisition for subsequent utilisation of facts, methods, etc.
4. The abstraction of meaning.
5. An interpretative process aimed at understanding reality.
6. Developing as a person (added subsequently).[6]

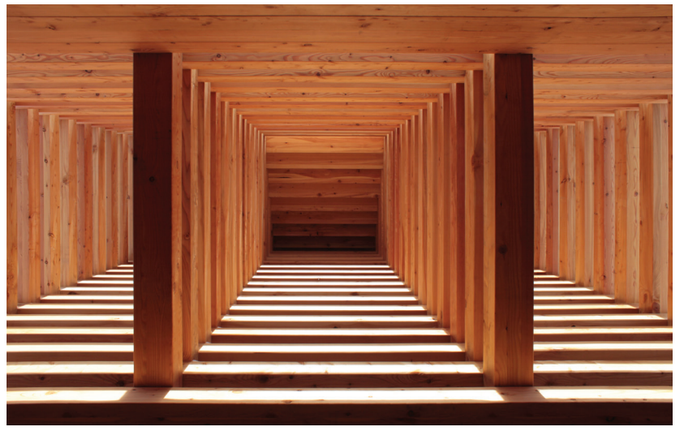
Of these six conceptions, the last two in particular appear in spatial learning processes: learning as an interpretative process aimed at understanding reality, and learning as developing as a person. After the discovery of these similarities in this text, I used the methodology to reflect on the practical experiences during the spatial learning events of my research.

General Outcome

Spatial learning exercises for all ages appear to be productive educational methods in teaching the joy of learning and empowering the participants to develop their own skills and strategies for acquiring further, more complex, detailed, and fact-based knowledge. Building as an activity provides an ideal environment for experience-based education due to its seemingly elementary, yet multi-sensory and multi-layered activities, which raise the curiosity and awareness of children effortlessly, and the axiomatic nature of the built environment, which immediately embed the children into a safe situation, yet with an unexpected amount of new possibilities in perception and creation.

Personal Outcome

While trying to teach children about space and architecture, I ended up studying the learning process itself and I realised that it was me who had learned the most about the things I wanted to teach. The way they paid attention, perceived, and interpreted their spatial environment opened up new approaches in both my professional life as an architect and as a researcher.



Chapel in the Woods at Saint James Pilgrim House, Pannonhalma, 2010 by CZITA Architects (Tamás Czigány, Róbert Papp, András Cseh) [B]

As a teacher, this learning process turned me into a co-learner - or at most facilitator - with a bit more experience and a bit less openness, yet helped me to work on the latter.

As an architect, I repeatedly realised the importance and the potential of space and spaces in architectural design, and I tried to apply both the knowledge and the experimental behaviour acquired throughout the Pre Architectura programme into the design tasks I was working with. A few examples of the buildings erected during this period are introduced in photos alongside the dissertation as presentations of my parallel development as a practicing architect. [B]

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Practical Details

The critical approach and evaluation in this text always acknowledges the work it investigates. Avoiding continuous apologising like the chronic excuses of Slavoj Žižek, this appreciation is not mentioned further.

The unfinished trains of thoughts found in this paper are seemingly far from the requirements of our doctoral world, yet absolutely necessary due to the central knowledge learned during this research.

The thesis and the Learning Through Space subject as a masterwork overlap in some cases. The complete separation of the two would have caused complications understanding either individually; therefore, I decided to include these necessary parts in both texts, some even with identical wording, regardless of not being proved necessary.

The introduced workshops not marked otherwise have been created by the author during the Pre Architectura programme.

The photos not marked otherwise have been created by the author.

The Hungarian quotes have been translated to English by the author.

Merlin Donald, Origins of the Modern Mind: Three Stages in the Evolution of Culture and Cognition, Harvard University Press, 1991, p.16 [7]

Immanuel Kant: Critique of Judgement, translated by J. H. Bernard, Hafner Press, 1951, p. 149. quoted from Kent C. Bloomer, Charles W. Moore: Body, Memory and Architecture, Yale University Press, 1977, p. 26 [8]

"Now we can go, I have drawn the world."
Contemporary Architecture Trip for Children at Pannonhalma, 2011 [C]

Human behaviour in perception, cognition, and learning has changed significantly in the past decades, generating the necessity of the development of appropriate educational methods. According to Merlin Donald, in the history of mankind so far three evolutionary transitions have occurred: the first was the beginning of human representation, miming events, the second "was the emergence of the human speech system, including a completely new cognitive capacity for constructing and decoding narrative" [7], and we are taking part in the third transformation marked by visual symbolism. Even though the first medium of thought and its expression were images, this on-going process is not a return to those skills and tools. Instead of the abstraction of a thing to a picture, we now apply the reality of the picture into mediating life. The current state of human attention towards the environment is subconscious on many levels and neglects the need for continuous mental judgement in the Kantian sense.[8] The focused vision of a symbol is accidental and happens at a certain time as the general practice of perception and cognition is a peripheral one and happens continuously through time and where the person is a symbiotically coexisting actor with the environment he is encompassed by. This apparent change of behaviour lacks responses in the next step of consciousness, in the learning processes so far, following the change from textual to a both physically and mentally encompassing environment of pictures as a mixture of reality and virtuality. Raising these two encompassing worlds to a conscious level to achieve a more interesting and fulfilling life still happens through the use of language; therefore, investigating the connections between creativity and language is one of the key focus points in researching the processes of spatial learning.

1.1 Perception and Interpretation - and Verbality

Seeing is the two-way process of collecting visual stimuli and projecting our known patterns in order to decipher our environment, resulting in a flow of continuous interpretation. Hence, our courses of action are based on both visuality and verbality. Even though this balance operates inside our brain, on an active level our perception of the world is mostly visual and our communication is mostly verbal. We interpret the seen and turn it into the spoken leaving an insignificant place for abstraction where we have less control and more possibilities - the field of creativity. In children working on spatial tasks, the balance of visuality and verbality is restored, or rather balanced like a seesaw. They use a reductive amount of wordiness, leaving space for abstraction in itself.[C] Their first step is, instead of creating a story, to build up a welcoming background that is capable of

Martin Heidegger: The Origin of the Work of Art in Martin Heidegger: Basic Writings, edited by David Farrell Krell, Harper Perennial Modern Thought, 2008, p. 170 [9,10]

hosting a narrative, or rather one narrative at a time - a world in the Heideggerian sense, which "is not the mere collection of the countable or uncountable, familiar and unfamiliar things that are at hand. But neither is it a merely imagined framework added by our representation to the sum of such given things. The world worlds..." [9] This is done through simultaneous creation and interpretation. "By the opening up of a world, all things gain their lingering and hastening, their remoteness and nearness, their scope and limits." [10] The created space with its contents and the child's perception of it defines everything. If questioned, the answers are instantaneous and precise due to their continuously complete readiness. Two different scenarios follow the event when a world opens up: usually it starts working and the story at the beginning continues to unfold; nevertheless, at other times a new world appears through new discoveries, bringing its new story with it. Both the creation and the 'worlding' function without verbality on a personal level, yet when it comes to the need for sharing their experiences, communication results in the increasing use of language. Vision doesn't work as a tool for communication by itself, and it is underdeveloped for teamwork or sharing. However, through common narratives, collective creation and usage become possible.

1.2 Language and Creativity

Jessica Hemmings: Finding the right language for things, published: http://jessicahemmings.com/index.php/finding-the-right-language-for-things/, 03/01/2013 [11]

The use of language in creative processes raises questions on numerous levels. First and foremost, questions arise about its mere existence - whether it provides any advantages during the process or by its mere appearance therein whether it creates unnecessary boundaries that exceedingly restrict the rules of creation that emerge from its nature. Secondly, we can examine the timing of its appearance in relation to the creative process - whether it starts prior to the action itself (planning), appears and operates parallel to it (cognition), or only happens afterwards (explanation, evaluation and critique). Finally, we can note the subject of verbality - whether it investigates the creation as the process itself or whether it targets its results, considering the created things as outputs. Jessica Hemmings, who labels herself a "textile writer," also explores the connections between the sophistication and quality of a work and the text about it in addition to how these influence each other.[11]

However, if we look at creating processes as the basis of learning, language is inevitably required to raise our subconscious experiences of deeds to a conscious level. The role of the teachers in spatial learning and architecture education is to make this transition as natural and neutral

as possible, maintaining the brutal intensity of the physical act while creating a background for contemplation and the possibility of remembering and repeating the learning event for long-term memory and knowledge.

The connection between the surrounding world and its verbalised entity has been a key question in philosophy from the beginning. “Is the structure of a simple propositional statement (the combination of subject and predicate) the mirror image of the structure of the thing (of the union of substance with accidents)? Or could it be that even the structure of the thing as thus envisaged is a projection of the framework of the sentence?” [12] Heidegger’s question points out different ways of teaching creativity and openness. Providing examples seems to be a necessary step in the presentation of extremities of ideas, yet following such precedents reduces innovative thinking. It seems that as an introductory step, rich descriptive texts and/or exotic examples can free students’ habits of solving problems based on given recipes. However, it is also important to note that, parallel to this approach, very mildly determined exercises are also beneficial, whereby the need to come up with something from scratch pushes the participants towards innovative research and discovery, and/or trial and error process.

The “Narrative Structures” [D] experimental workshop was part of De-a Arhitectura TALKS 1.[13], the first national and international conference on architecture education for children in Romania. The participants received the task of building a city in three separate groups with slight alterations to the wording of the task: Team A: City, Team B: Invisible City, Team C: One Description of Italo Calvino: Invisible Cities.[14] They worked individually on one city each and at the end we compared the processes and results of all the works. The most open-minded and creative solutions seemingly came from Team C, who started working surprisingly easily; nevertheless, all of its participants admitted that they were merely following the “instructions” of the text. Moreover, despite the fact that the task was clearly to investigate an urban structure, instead of trying to fulfil this requirement, they produced sculptural solutions. Team A mainly constructed clichés of urbanism, yet during the discussion it was evident that each team member created their own, in some cases mesmerising, story amongst the built frames. Team B had the slowest start, yet their results represented a balance between pre-existing knowledge and innovative initiatives to perceive and transform the urban tissue. The passionate discussion that followed was about the facilitator’s responsibility for knowing the desired result and choosing the appropriate tools for achieving it. It was an intense example of how the use of verbality changes the outputs of the seemingly same task, sometimes with contradiction between appearances and contents.

Martin Heidegger: The Origin of the Work of Art in Martin Heidegger: Basic Writings, edited by David Farrell Krell, Harper Perennial Modern Thought, 2008, p. 149-150 [12]

Bucharest, Romania, 15-16 November 2014 [13]

Italo Calvino: Invisible Cities, translation by William Weaver, Hartcourt, 1974 [14]

Vera Marin, founding member of the Romanian De-a Arhitectura Association introduces her City at the Narrative Structures workshop during De-a Arhitectura TALKS 1. 2014 [D]

From the architect's and architecture educator's point of view, words play a dangerously restrictive role during the creative process. Nevertheless after the act of creation and when aiming to be understood, text and words overshadow the product itself when it is presented and interpreted to the parent, the class, the client, or the public. One rule in Lebbeus Woods's provocative Architecture and Resistance declaration shows the fight against the fear of loosing control in the process of architecture, stating that we should "resist the feeling that you should explain." [15] Explanation foreshadows a higher level of the self, which can result in an arrogant leading role. However, if we use the word 'interpret' instead of 'explain', we easily reach the necessary step in raising consciousness towards the spatial and built environment, while avoiding the unfortunately usual stereotype of pretentious architects.

"Speech cuts across vision." [16] This occurs where vision is associated with knowledge and is codetermined with the act, forming each other both ways. The use of language is inescapable to provide the feeling of safety on multiple levels. The knowledge behind language provides a safe ground for learning but on an even more elementary level opposed to any action that can be felt as a threatening act towards our existence. According to Lévinas's ethics, "The formal structure of the language announces the ethical inviolability of the Other," [17] which we also perceive from the other towards ourselves.

The fireNEST structure [18] is based on a spatial representation of Lévinas's thoughts about the face of the other. The design and building process of the installation ran parallel with awareness and attention exercises developed by István Berszán [19] and lead by Bálint Veres. The merging of architectural and philosophical approaches led to the concept of the installation around a small bonfire, implementing three design objectives:

1. *Meeting with my own existential responsibilities in the face of the other: The face of everyone around the fire should be lit, offering it to others to see.*
2. *Democratisation of the fire while keeping with the fire's intimacy and the proximity of the people around it: Everyone around the fire should be able to see its light and feel its warmth, even if sitting in outer circles. Bonfires are either small and for a few people, or large and for many people. If more people try to sit around a small bonfire, the furthest ones are outside of the light, while large bonfires force a large diameter for the circle of people resulting in impersonal distances to those who see each other frontally. The search for a solution lead to an amphitheatre-like structure.*

https://lebbeuswoods.wordpress.com/2009/05/09/architecture-and-resistance/
published 09/05/2009 [15]

Emmanuel Lévinas: Totality and Infinity, translated by Alphonso Lingis,
Duquesne University Press, 1969, p. 195 [16,17]

designed and built at Hello Wood 2013, together with Bálint Veres [18]

István Berszán: Terepkönyv, Koinónia, 2007 [19]

The module element and the structure of fireNEST

(Hello Wood 2013, team leaders: András Cseh, Bálint Veres) [E]

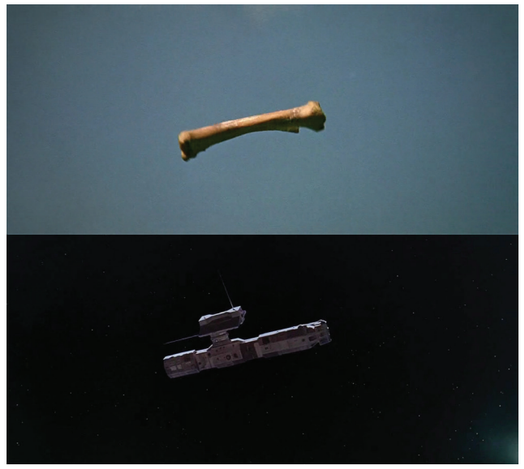
3. Answering the call of Hello Wood 2013, which was 'Step Closer': The modular structure focuses on connections and co-dependence. One module is an unstable bench, unusable by itself. However, when attached to another one, the two stabilise each other, providing suitable seating places for the users. The structure is most stable if forming a whole circle, each element depending on the other.

The coexistence of the hyperactive attention and behaviour of the design process with a short deadline and the intensive construction period and the meditative awareness of contemplation and verbal communication worked with great difficulties, with a lack of the anticipated depth in both. Nevertheless, as a study in learning experiences, the experiment was a palpably defining moment in understanding the connections between creative activities and language.[E]

Creating a safer environment to work in through verbal communication during the creative process has its benefits in opening up the participants, but the continuous change between the process of creation and the verbal interpretation consumes a serious amount of energy without noteworthy gains to the process or to the results. One change (starting with one kind of behaviour and after the change resuming the process completely with the other) in these attitudes in awareness enhanced the development and deepened the learning experience, while two changes (starting with one kind of behaviour, changing to the other, and after switching back to the original one) proved to be manageable and provided a good setting for framing the activities, especially in the case of the verbal (preparation) - creative - verbal (evaluation) scheme. However, more than two changes made both the contemplation and the active creation elements barren.

1.3 Tools and Stories

Tools and stories determinate each other intensively in the building process, especially in large-scale building. As the creator is part of the story as a process, this might help when dealing with today's society and living the most fulfilling life using our environment adequately. Previously (until the beginning of modernity), the present was built on the experiences and knowledge gained from the past. In the utopia-fuelled modern society, theories and desires about the future tended to control the actions of the present. This behaviour has caused our traditional communication channels, which are focused on our collective knowledge of the past, to falter. Today, even the concept of the future is fading away. Due to continuous changes, 'the new' and 'the unexpected' are constant attributes of the present. New strategies are being invented in all



Péter Mátrai, doctoral tutoring session, 02/06/2013 [20]

The Match Cut in Stanley Kubrick's 2001: A Space Odyssey, MGM/Warner 1968. [F]

Children build Saint Ladislaus Castle, 2014 [G]

ways of life; therefore, in communication as well, this continuous change is becoming the state of existence. The technologies used in these changes transform the output of their operations, and in a symbiotic way they are restructuring our logic and thinking as well. The most famous match cut of film history, in Stanley Kubrick's 2001: A Space Odyssey [F], illustrates this ultimate change of scale and perspective in the history of humankind. Referring to these changes, two contemporary Hungarian architects recently outlined the difficulties of generation gaps and communication failures vividly. Péter Mátrai, who is also an experimental musician, said about learning and creating architecture: "We used to believe in the line - or at most in the patch." [20] The informational and technological boom changed the tools for creation and also for communication. János Golda goes even deeper in the search for possible strategies when he repeatedly claims in his lectures that up to the end of the 20th century fathers were able to give sufficient advice to their sons for leading a fulfilling life, whereas in contemporary society due to dramatic overall changes older generations are not familiar with the rules of their current surroundings any more and hence are incompetent in providing tips for solutions to life's challenges. Moreover, in spite of all of the expertise we have, we are unable to predict even the close future; therefore, the most we can educate our children is to be prepared for continuous transformation and unpredictability. As a result of the constant changes of the world, we are bound to reinvent our surroundings and the tools to manage them persistently, a process deeply resembling our continuous reconstructing operation when experiencing our spatial surroundings.

However, the method of following examples that have already happened in stories - especially if carried out with a critical approach - is not just beneficial, but essential to the individual's development. Learning through repetition turns knowledge into skill, leaving space for deeper focus or broader approaches. Most of our learning experiences happen through repetition with alterations, using our already acquired skills for solving the familiar elements or understand the setting of the challenges we are facing and developing our new tools to deal with the new challenges. Architecture education can help us to improve our skills in order to be able to handle the challenges of the built environment, while spatial learning exercises can prepare our readiness to respond to the unexpected.

Saint Ladislaus Castle [G] *was a three-week-long creative summer camp that provided a learning experience about historical events and creative processes simultaneously for one hundred children every week. The built frame of the camp consisted of a gate, designed and built together by university*

Detail of the Gate of Saint Ladislaus Castle, 2014 [H]

students and the facilitators of the different workshops, and ten huts for the workshop activities by the children themselves.

Over 400 pallets and 3 kilometres of wooden battens were used to create the castle's entire construction. Due to the weight of the elements and the dangerous tools (saw, screw gun, nails, and hammers), children were required to pay attention to each other and work closely together. The process and the results demonstrated that if children are considered mature enough and trusted with serious tasks and equipment, they begin to behave accordingly and are capable of unexpectedly significant accomplishments.

I had personal doubt whether the historical theoretical framework would allow the spatial learning experiences I usually try to focus on with children, avoiding literacy and using the abstract toolkit of architecture, but the results clearly showed that the building phase remained an intensive spatial-integrative event by itself, and the created structure provided the foundation and space for the historical layers and features added afterwards.[H]

Kent C. Bloomer, Charles W. Moore: Body, Memory and Architecture, Yale University Press, 1977, p. 27 [21]

Techne (τέχνη) is a term in philosophy used for the implication of knowledge of principles although with an intent of making or doing as opposed to disinterested understanding. As an activity, techne is concrete, variable, and context-dependent. [22]

Steven Holl: Parallax, Princeton Architectural Press, 2000, p. 13 [23]

Steen Eiler Rasmussen: Experiencing Architecture, The MIT Press, 1959, p. 9 [24]

Architecture education faces the difficulty of teaching "nothing". Spatial education raises the self-reflecting ultimate question: How can space, mostly considered to be nothing - or rather emptiness - be taught? Space is a tricky thing when it comes to explanation. Usually, it is not defined by its own properties but by those of its boundaries. However, through experience it can be understood, interpreted, and dealt with. The course for first-year students at Yale School of Architecture in the recent past tried to take these introductory steps through raising students' empathy towards objects and their spatial environment, focusing on bodily experiences.[21]

The word techne means learning by experience, whereby the technology of the production and the understanding of the process are equally important complementary parts of understanding the world around us.[22]

Today we experience space and time compressed and expanded at the same time in both the scientific achievements and the incidents in our everyday lives. Discovering the world through architecture evokes the necessity of dealing with and understanding space and our spatial existence in time because "it is precisely at the level of spatial perception that the most powerful architectural meanings come to the fore." [23] Since we spend the vast majority of our life in our built environment, understanding these meanings empowers us for a better use of this environment.

2.1 Between Boundaries

Steen Eiler Rasmussen claims that "the architect works with form and mass just as the sculptor does, and like the painter he works with color." [24] In this statement, he misses one crucial difference between the architect and the sculptor - namely that the basic element of architecture is space, the lack of mass, and the void left by the form. Although he writes about cavity as a result of construction that eliminates material and the opposite of volume and mass, in his theory the concept of space as a whole and spaces as a system are secondary in experiencing architecture.

The dual nature of architecture emerges from the abstraction of space as something instead of an absence and the elementary sensation of its boundaries as forms and materials that create the frame of our everyday lives. Nevertheless, when it comes to learning about the built environment, even architecture education tends to support the knowledge of the features of the surroundings, leaving the understanding of the concept of space in the margins in the hopes that it will integrate itself back into the equation somehow. On the other hand, spatial researchers and theorists tend

to try to balance the duality of space and mass through only focusing on the former and ignoring the qualities of the enclosing faces and volumes at its edges.

These boundaries are obviously undetached from the enclosed space itself - not just physically, but they bear the imprints of the historical, cultural, and social layers of the building. When teaching through the built environment, this platform of layers can provide the connection with all other fields and sciences on an easily perceptible level. For example, when teaching about the role of plot in literature, the sequence of the plot's surroundings can help with the understanding of the flow of actions.[25]

However, it is possible to focus on the emptiness of a space by presenting the possible appearances within or visualising the connections between the elements of a spatial structure. The use of light and darkness can help either to differentiate the qualities of solids and voids or to merge their boundaries together. Perspective installations, which consist of multiple objects or surfaces in a given space in such a way that the work itself is visible from only one point of the space, offer an intense feeling of the space when stepping out of the proposed spectator's point: the safe picture of the composition suddenly shatters before our eyes and its elements fly towards us or away resulting in a perceptible experience of the expansion of space from the two dimensional picture.

Light-Catcher was a rare occasion of an evening workshop for children at the Researchers' Night event at Széchenyi István University. All the lights of the Architects' Atelier were switched off apart from a spotlight in the middle of the ground floor that faced downward, while on all three floors of the house in various nooks and crannies objects were placed on pedestals and chairs. Children were given hundreds of CDs with the necessary equipment to fix the CD-s in the required positions to take the light of that single spotlight and spread it around the house to illuminate all of the exhibited things. Spatial boundaries suddenly changed from their normal perception because the children started to think about how to pass through them as light instead of human beings. The void in the middle of the house became an accessible space where the upper floors were easily reached by light. Nevertheless, some objects got their spotlight through eight or nine angles of reflection on CDs placed along the room system of the building. The experiment offered a spectacular visualisation of the physical law of reflection as well as the spatial richness of a simple house.[1]

Irodalmi Magazin 2014/3. Katedra Óraterv, Bártfai Borbála: Kacskaringók Krúdy Gyula szövegvilágában - Javaslatok a szövegalkotási eljárások tanításához, p 113-115 [25]

Light Catcher workshop at the Architects' Atelier in Győr, 2013 [1]

2.2 Room for Appearances

Zoltán Szentkirályi refers to creating spatial order in the sense of space-arranging instead of space-forming [26] and follows Auguste Perret [27] in taking space as a granted common source, a medium that allows the appearance of things and activities through its property as part of the universe which is not filled in with solid material. An interesting opposition to this statement is Juhani Pallasmaa's approach to seeing as touching with visuality merely being an extension of the tactile sense when he describes "our contact with the world tak(ing)place at the boundary line of the self through specialized parts of our enveloping membrane." [28] Considering these two theories as complementary, we arrive at the conclusion that the direct surrounding space belongs to the person it encompasses. At the same time, it also indicates that space only comes into existence when perceived by a conscious entity which recognizes the limits of the self and the edge of its senses to define space within these borderlines. Plato arranges the world into three categories: being, space, and becoming, and he defines space as "everlasting, admitting not destruction, but affording place for all things come into being, itself apprehensible without sensation".[29] However, recent interpretations in medium philosophy consider a broader translation of the agent that allows for becomings and beings in the Platonian sense, calling the third category the medium itself. The connections between space and medium has been a continuous development in human history, both being considered as entities and non-entities at the same time.

The quality of space and/or medium presupposes the perceiver's intentionality towards the act of appearance. Phenomenology, the study of subjective experience as an 'in-relation-to' phenomenon, takes a step from the medium towards meaningful communication and the intersubjectivity of beings, where the person and the world are mutually constitutive. Noesis, the intentional part of the act of consciousness, occurs in time, while the ideal content or sense (noema) is "the object of consciousness just as it is experienced or intended in that act".[30] The time dimension of architecture makes this differentiation palpable for the spectator and if made conscious, this experience can lead to further intersubjective discoveries and a more precise positioning of the self in the structure of the surrounding world.

Tamás Cseh, a contemporary Hungarian singing storyteller, talks about the world's magic having been unmade. *"Mióta a világ varázstalanítva lett..."*.[31] The difference between understanding and feeling might be contradictory without one's consciousness in the phenomenological sense.

Szentkirályi Zoltán: A térművészet történeti kategóriái,
in Válogatott Építészettörténeti és Elméleti Tanulmányok, TERC, 2006, p. 277-279 [26]
Auguste Perret: Contribution À Une Théorie de L'architecture in (Das) Werk, Band 34, 1947 p. 54 [27]

Juhani Pallasmaa: The Eyes of the Skin, John Wiley & Sons, 2005, p. 10-11 [28]

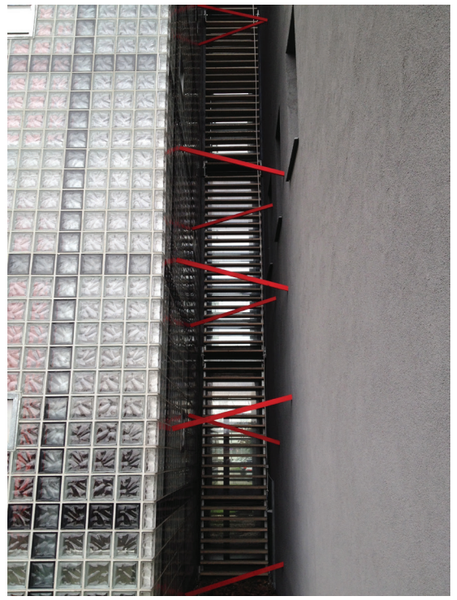
Plato: Timeaus, edited by R. D. Archer Hind, Macmillan and Co., 1888, 52 A-D, p. 183-185;
Bálint Veres: Art Philosophy course, MOME DLA, 2012/2013/1. semester [29]

David Woodruff Smith: Husserl, Routledge, 2007, p. 312 [30]

Tamás Cseh, Géza Bereményi: Szerelmes dal,
A telihold dalai, 1997 [31]

Church, Újrónafő, 2014 by CZITA Architects [J]
(Tamás Czigány, András Cseh, András Nagy)
photo by Tamás Czigány

Tex(tiles) - Critical Writing about Textile Practice lecture (02. 06. 2013 MOME Transfer Lab) [32]



'Invisible' Creative Week
at the Department of Architectural Design
of Széchenyi István University, 2014 [K]

However, both doing and understanding architecture can result in the appearance of such wonders as deeper layers of our existence.[J]

2.3 The Invisible Entity

Space is democratic; spaces are hierarchic - *in parallel with Jessica Hemmings's quote from her Tex(tiles) - Critical Writing about Textile Practice lecture in which she states that "Textiles are democratic - everybody is wearing them."* [32] Architecture is separated from everyday life due to the former, and from art due to the latter. The continuity of space doesn't cease to exist with building.[K]

The Space and Spaces exercise targets the connection between the infinite and boundaries. Two different approaches are possible: A. Students are asked to place lines and/or planes from one end of the space to the other. As a result, the space will gradually turn into volume, which is more easily perceptible as an entity. This task is an introductory exercise when starting to learn about spaces, visualising the basic sizes, proportions, and connections of the chosen space. B. Students are asked to draw - or mark with a rope - sections of the space or the whole building starting from any point on either surface of the room. In some directions it will be possible to have a closed outline of the space, but in most cases we realise that our physical limits and the insufficiency of our tools cause the end of the outlining process; for example, when the line runs out of the top floor window. Repeating the same process will allow us to visualise the character of a space with its connections to the surroundings - its geometrical complexity and its open or closed nature.

The act of detachment - architecture itself - differentiates space into a hierarchic order and a variety of spaces in their size, scale, shape, function and sensation, serving our needs through a system of subordination. Experiencing space as a human being also bears hierarchic qualities: on the ground we move in approximately two dimensions, since the third one (up and down) is merely comparable to our distances covered in the first two (forward and backward, left and right), which are open to us for wandering freely even in great distances, moving in the third dimension requires significantly greater effort and technological invention from us.

Nevertheless, the conscious comparison of the Cartesian grid with its neutrality towards directions and an experience with the differences of the horizontal and the vertical is a necessary step when understanding architecture since it starts with this upward-downward dimension. "Architecture is born of this original discrepancy between the two spaces – the horizontally oriented space of our

Dom Hans Van Der Laan: Architectonic Space,
E.J. Brill, Leiden, 1983, p. 5 [33]

Archetypes workshops [L]

Janet Cardiff: 40 Part Motet, Venice Architectural Biennale, 2010 [34]

David Woodruff Smith: Husserl, Routledge, 2007, p 258 [35]

experience and the vertically oriented space of nature; it begins when we add vertical walls to the horizontal surface of the earth. Through architecture a piece of natural space is as it were set on its side so as to correspond to our experience-space. In this new space we live not so much against the earth as against the walls; our space lies not upon the earth but between walls." [33]

The Archetypes workshop introduces the first movements of building, the primal appearance of architecture in nature. Children use the natural materials provided by a nearby forest to construct examples of the archetypes of buildings, such as dwellings, lookout-points, or community spaces. The raw material with its unsophisticated connections differs from the usual built environment; however, the artificial forms created by the participants clearly distinguish them from the structure of the natural environment - resulting in the visualisation of the borderline in human evolution when the first conscious actions happened for protection against the challenges of the world. The presence of civilisation is becoming stronger in these structures when children are allowed to use complementary materials to those found in nature. Either way, Hans Van Der Laan's primal direction of verticality as architecture is clearly visible in these basic constructions.[L]

From this angle, architecture and music don't seem to be alike; on the contrary, they appear to be the complementary opposite of each other. The experience of music is mostly based on high and low, ascending and descending, while the other dimensions fall behind in importance; and, direction is mostly perceived in the time factor of listening to the music. On the rare occasions of architecture and music composed together, a completeness of existence and the awareness of the self in all four dimensions are vividly perceptible. During the 15th and 16th centuries, at the time of the transformation from Renaissance to Baroque music, compositions included the spatial use of the sacral spaces they were to be played in. A triumphant trombone from above or a quiet viola da gamba from low and their communication placed the listeners directly into the scenery. A contemporary example of how music, space, directions, and time enhance the intensity of an experience was exhibited at the 2010 Venice Architectural Biennale, in which Janet Cardiff installed the sounds of a forty part motet by Thomas Tallis in a circle, where visitors could walk between them and listen from the inside.[34]

Intensive experiences raise our consciousness to a level, in which the philosophical meaning of apperception, the parallel consciousness of the experience, and the self is encountered. Moreover, they provoke consciousness as a consciousness, which "is almost always a consciousness of something, we call intentionality." [35]

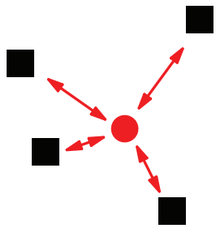
Slavoj Žižek: Event - Philosophy in Transit, Penguin Books, 2014, p. 2 [36]

Mary Wollstonecraft Shelley: Frankenstein, or, the Modern Prometheus, 1869, viewed on Google Books, p. 142 [37]

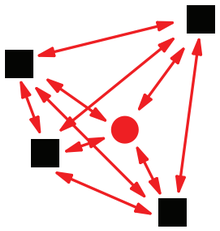
Alain Badiou: Being and Event, translated by Oliver Feltham, Continuum, 2006, p. 141 [38]

An event is described by Slavoj Žižek, celebrity philosopher of our time, as "something shocking, out of joint, that appears to happen all of a sudden and interrupts the usual flow of things; something that emerges seemingly out of nowhere, without discernible causes, an appearance without solid being as its foundation." [36] The change from not-knowing to knowing is the ultimate human event; physical experience can also be described as the difference between not knowing what something feels like and knowing what something feels like. The sensation of learning is apparent in children, yet it seemingly disappears while growing up and, oddly enough, while supposedly knowing more about the world. As we grow into the overly intensive, perceptually aggressive world, we turn from the joy of learning to the seemingly less energy-consuming state of unconscious coping with the surroundings because "nothing is so painful to the human mind as a great and sudden change" [37] and our senses are overloaded with those nowadays. The intensity of the learning experiences from infancy disappears through education requiring teachers to change their primal role to that of motivators. The transition from educator to facilitator, which used to be the key point in educational debates in the past decades, is not sufficient anymore. Generations Y and Z are being continuously overloaded with data and stimuli preventing them from focusing on one problem, resulting them on missing out on the other layers of their ambience. The solution is to either provide the children with an experience intensive enough to counterweight the constant awareness of their lives, or to present them with tasks that stimulate them on multiple levels requiring the kind of attention from them that they are used to. Spatial learning resolves the challenges on all of these levels in a natural way due to: its difference from official education objectives and methodology; the fact that it is interesting and it occupies all the senses, turning up the intensity level of the learning experience; and that it integrates both physical and mental stimulation, from sensory exercises through geometrical riddles to the eventual tasks of creation. Moreover, it allows the inhibition of face-to-face communication to dissolve through the medium of the building act, which provides a channel similar to the virtual environment of computers; only here, instead of the communication of the self, the existence of the subject being created becomes the inducement. Building is the real productive process, based on presence and its representation simultaneously, where the act itself is defined in an appearance as an outcome. This makes spatial creation as a learning process a rather accurate illustration of Badiou's "homogeneity of the ontological schema of natural presentations." [38]

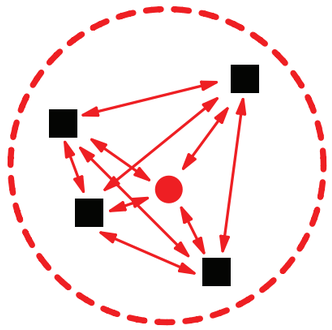
Jean Piaget, Bärbel Inhelder: The Child's Conception of Space, Routledge & Kegan, 1956, p. 1-15 [39]



Development of Spatial Knowledge 1. - Egocentric stage [M]



Development of Spatial Knowledge 2. - Allocentric stage [N]



Development of Spatial Knowledge 2. - Geocentric stage [O]

3.1 Spatial Introduction

Psychology still bases the development of spatial knowledge on the research by Jean Piaget and Bärbel Inhelder. Spatial reception appears prior to representation, and hence becomes the basis of all learning processes. While researching elementary spatial relationships in early childhood, Piaget and Inhelder proposed three periods of sensory-motor development from birth to the commencement of representation, which explains the changes from pure reflexes to "internalized co-ordinations".[39] The three periods were later named the egocentric, the allocentric, and the geocentric stage.

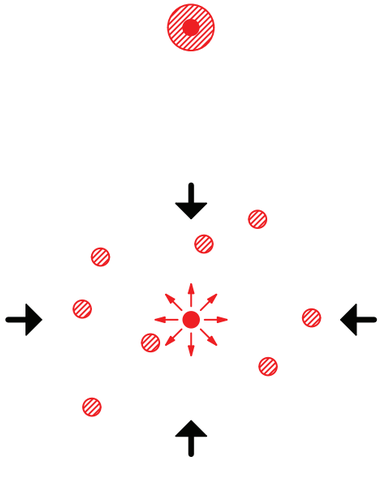
The egocentric stage[M] consists of primitive perception of the immediate surroundings of the self through sucking, touching, smelling and seeing - a process where the child perceives both visual and tactile-kinaesthetic spaces parallel to each other, yet not connected at this stage. Proximity plays a key role as only nearby objects can be received with the developing senses. Basic separation and order of the objects appear as the first signs of organised points of reference although the surroundings of an object and the sense of a continuous spatial field still merge into plastic and flexible structures.

In the allocentric stage[N], the child reaches the understanding of coordination and correspondence. "At this point there occurs a complete transformation of the perceptual space, due to the systemisation of movements which are guided by vision and which consequently react back upon it." Perceptual reflex movements become intentional actions of handling an object resulting in the development of the concept and constancy of shape and size. The explorations in this period through the grouping of movements and the displacing of objects by hand lead to the discovery of the distinctive relationship between the objects themselves and also between the objects and the surrounding space.

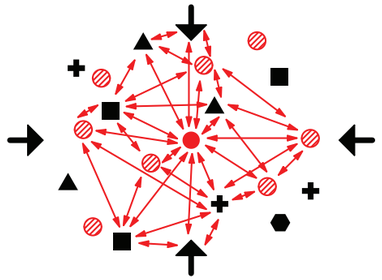
The geocentric stage[O] develops from systematic observation through tentative efforts at experimentation to the intelligent practical activity of coordination between the self and all its surroundings. The first appearance of mental images introduces the possibility of delayed imitation and abstract thinking now detached from the so far concurrent action itself providing the start of all learning processes in developing knowledge.

Environmental cognition research presents an interesting parallel process to the previously covered early childhood development stages. Susan Saegert and Gary H. Winkel produced a

Adesh Agarwal, A. K. Saxena: Pshycological Perspectives in Environmental and Development Issues, Concept Publishing Company, 2003, p. 39-41 [40]



Environmental Cognition Paradigms - P
Adaptive Paradigm



Environmental Cognition Paradigms - Q
Opportunity Structure Paradigm

Environmental Cognition Paradigms - R
Socio-cultural Forces Paradigm

synthetic framework for the plurality of paradigms in environmental psychology.[40] The research focused on the relations of the physical environment to both psychology of perception and social psychology and resulted in singling out four major paradigms.

The adaptive paradigm [P] is based on the assumption that behaviour is motivated by the goal of biological and psychological survival. The actions of a person are rooted in the protectional urge against the immediate threats of the surroundings, while keeping the perception of the environment on a physically close, palpably nearby level.

The opportunity structure paradigm [Q] considers the environment as an opportunity structure for goal-directed action, and even though it has a weak identity from the psychological point of view due to its geographic and sociologic connections, its aim to study a person's relationship towards the physical and social environment makes it valuable in this comparison to early childhood development. The key proposal of the opportunity structure paradigm is that human behaviour is composed of a continuous evaluation of the imagined possibilities in the close, though not immediate, environment.

The socio-cultural forces paradigm [R] focuses on a person as a social agent who, instead of fulfilling their own needs and desires, seeks and creates meaning in their environment through social interaction in regards to the self and a group it belongs to simultaneously.

The fourth paradigm, the interparadigm historical synthesis, attempts the integration of the previous paradigms, which are considered to be linked by a relationship of progressive inclusion moving from the internal and individualistic approaches towards integration and social psychology. In spite of these findings, typical current educational tendencies are to merely apply the socio-cultural forces paradigm based methodology, expecting students to understand the complex interdependence of the various levels of society and sciences without providing sufficient support for the previous stages in the development of personal knowledge and perception. Moreover, school curricula tend to require the same kind of attention and same quality of knowledge from all children even though the differences among human beings are not just obvious, but have recently been in the centre of most educational debates around the world.

Learning is a process of gaining both skills and information layer by layer, building on the foundation of basic psychological competences rather than acquiring equivalent packages of knowledge as data from various fields - a process representative in the school system.

Alvaro Pascual-Leone, Amir Amedi, Felipe Fregni, Lofti B. Merabet: The plastic human brain cortex in 2005 Annual Review of Neuroscience 28, p. 377–401 [41]

Due to the fact that spatial knowledge development takes a child through the previous stages of learning and thanks to recent neuroscientific research [41], the brain's plasticity is proven to be developing throughout our lives, and the advantages of spatial education in all ages appears to be beneficial for development by providing a better foundation of spatial knowledge for higher level information management and learning processes.

3.2 Aha

The difference between not-knowing and knowing is often described in psychology as the Eureka effect or the Aha moment, which refers to the common human experience of suddenly realising a previously undetected situation or understanding a previously incomprehensible problem or concept. Even in a conscious learning environment, this comprehension is always spontaneous and accompanied by an exclamation of joy or satisfaction especially when it is preceded by a mental fixation on an apparently unsolvable problem. In infancy, all everyday situations fall into this category, and their solution, the process of learning, produces joy. Later on, due to the structure of the educational system, we get used to focusing on given problems instead of discovering the possibilities behind everything. However, the skill of the latter is deeply appreciated by society in both professional and everyday life - an indication that we should maintain its integration into the education curricula, when possible.

Architecture Education for Children - an interview with Pihla Meskanen (in Hungarian): Építészetoktatás gyermekek számára - interjú Pihla Meskanennel, András Cseh, 20 April 2011, published: http://php52.epiteszforum.hu/node/19728 [42]

Architecture education offers a ready-made field to practice the thrilling experience of discoveries: in the apparently well-known environment of children lie infinite possibilities for perception, contemplation and action, all of which carry the chance for an aha moment; the contrast between the familiar and the new in the same subject is so intensive that it triggers the impulsive learning event easily. Basically, we distinctively learn to learn and the pleasure of learning through spatial discoveries is boosted by sensational experiences that can serve as motivation for further learning processes. The learning event of uncovering in the sense of making something apparent provokes the examination of all similar ambiguities. "You just open a new window, and if someone is at least a bit interested, they will discover the scenery behind." [42]

With the dramatic change brought about by computers and the web, which is basically using external memory as a human being, the inventive sensation of learning is turned into the sensation of finding because we mainly expect the solution to our challenges to be already present somewhere in the technologically represented common knowledge. Search engines

Porta Pacis Visitor Centre, Tihany, 2013 by CZITA Architects
(Tamás Czigány, Róbert Papp, András Cseh, Réka Juhász, Györgyi Tóth) [5]

have provided us with the most powerful tool for remembering in the history of mankind so far - remembering not only our own personal events and stories, but those of others as well. Even though search engines are becoming more personalised, knowledge as someone's own property seems to be losing credibility. Many variations of the following sentence can be found in most civilisations: Knowledge can not be taken away from you. However, today we consider knowledge to be the combination of the memory of facts and the ability to process them, and it is clearly apparent that in taking away our machines we lose most of our knowledge. (Going into a discussion that it is not 'real' knowledge is pointless since, if we honestly take a look at our daily lives, we see that we use both the data and its processing algorithms almost continuously.) What is left is our ability to remember the surroundings from which we collected information and the ability to retrace the ways we achieved this through the obvious selection of prioritisation. Spatial education methodology and philosophy provide the structural system of memory and prioritisation by considering the environment as categories of meanings and possibilities.

3.3 Thing, Tool, Work of Art

Heidegger's categorisation of beings into things, equipment, and works of art is a sensible division also of the surroundings in the spatial learning process. We ignore our everyday built environment as it is mostly neutral; we take it for granted, and we hardly perceive it as 'something' even on a subconscious level - it is merely the setting which mediates the things and happenings in our lives. However, from time to time we use its features as pieces of equipment turning the same being into tools, and even less often the surrounding space stimulates our world into working, "worlding". The former distribution can be true to a wide range of beings; for example, in pictures (snapshots, signs, paintings). However, the difference here again is that we perceive ourselves as part of the thing, equipment or work of art, which is often based on our consciousness of our perception allowing the understanding of ourselves as well. We arrive back at learning, which is a place for observation and reflection, and, therefore, consciousness at this point.[5]

The switch between things and equipment in this triple Heideggerian classification can be achieved not only through human perception, but action as well. Things are around us. They are presented to us as the other, as something else, as outer entities. However, as soon as any interaction occurs with them, the spectator turns into a participant while turning the thing into a participating tool. While the difference between equipment and artwork is rather a change from physical to

Martin Heidegger: The Origin of the Work of Art in Martin Heidegger: Basic Writings, edited by David Farrell Krell, Harper Perennial Modern Thought, 2008, p. 161 [43]

metaphysical, it can be experienced in the learning by doing process, where we experience Heidegger's statement: "In the nearness of the work we were suddenly somewhere else than we usually tend to be." [43] without meaning that either creation or learning is a form of art in itself, rather that this sequence bears various possibilities, which are similar to those of experiencing a work of art in the Heidderian sense.

Verbality plays a crucial role here again. As evidenced in current art debates, the interpretation of the target overwhelms the target itself. Interpretation has become an art form by itself because the enclosing society of spectators can be more highly-educated and sophisticated than the artist him/herself, which results in a situation where it is the debate that decides the quality of a creation and makes it a work of art. The subject itself might appear completely differently in the context of the creation and the context of the interpretation, even up to the point of becoming two separate and different entities. As part of the evaluation of critique, verbality plays both an endowing and an unveiling role empowering or rejecting the subject of its focus beyond the entity itself.

Gaston Bachelard: The Poetics of Space - The Classic Look at How We Experience Intimate Places, Beacon Press, Boston, 1994, p 47 [44]

Instant Spaces at MOKKA + Pre Architectura summer camp 2012 [T]

Samu Szemerey at the Discussion Session of Architecture Education in Schools Conference, Műcsarnok, 10/13/2011 [45]

Marina Abramović: The Artist Is Present, MoMA, New York, 2010, photo by Anikó Ouweneel-Tóth [U]

Emmanuel Lévinas: Totality and Infinity, translated by Alphonso Lingis, Duquesne University Press,1969, p. 194 [46]

Kirsikka Vaajakallio: Design Games as a tool, a mindset and a structure, Aalto University Doctoral Dissertations 87/2012, p. 50 [47]

"Inhabited space transcends geometrical space." [44] Human presence transforms pure geometry into a living environment. The reactions towards given scenery alter our perception of its elements, both subconsciously and consciously.

Instant Spaces is an evental experience-based exercise of experiencing our own presence in different spaces, which are created by a large veil and the movement of air - either a natural breeze or the moving of the veil itself. Children take turn in two roles: one child becomes the perceiver and the rest of the group provides him/her with different spaces around him/her. These spaces only exist for a moment, then after the release of the veil they collapse giving the cut out space back to 'Space'. The speed of the event raises the child's awareness towards the details of the experience as well as the self in the space. In addition to this existential experience, the task is an appropriate tool to discuss the medium of space and its connections to materials from the surrounding surfaces to the air that occupies it.[T]

The automatic responses to our everyday environment loop back into how we feel and behave; therefore, raising these to a conscious level where we can deal with them seems to be at least beneficial. Samu Szemerey goes even further claiming that "spatial understanding is a question of survival in the 21st century." [45] Perceiving our own existence in the more and more complex structure of both physical and virtual reality is the key to the continuity of that existence.

Marina Abramović, the most influential performance artist of our time, directs our attention to human presence, which blossoms unexpected richness when consciously observed.[U] The intensity of the 'real' or 'true' encounter of two human beings echoes the ultimate event in Emmanuel Levinas's ethics of the Other when he talks about Infinity and the Face [46] as the medium which provokes the consciousness of the existence of the self.

This ultimate human experience happens as a learning event through connecting to other human beings, an area that contemporary education schemes rarely emphasise. Fact-based learning hardly connects one child to an other child on a primary level at any stage of the learning process (class, homework, presentation). Design and architecture education change this behaviour towards "creative approaches which do not consider users purely from the objective point of view but seek to understand people's subjective values, attitudes and desires as well." [47] The awareness of the other, and therefore the development of social connections, emerges easily in building exercises where co-dependence and the communication of the creative ideas are the general state during the process.

Steen Eiler Rasmussen: Experiencing Architecture,
The MIT Press, 1959, p. 135 [48]

Ready moment at the Chapel in the Woods at Saint James Pilgrim House, Pannonhalma, 2010 by CZITA Architects (Tamás Czigány, Róbert Papp, András Cseh) - photo by Bea Kakas [V]

4.1 Movement, Time

"Architecture itself has no time dimension, no movement, and therefore cannot be rhythmic in the same way as music and dancing are. But to experience architecture demands time; it also demands work - though mental, not physical, work." [48] Architecture has been compared to music based on a particular quote of uncertain origins much too frequently. (The quote most probably originates from Johann Wolfgang von Goethe or Friedrich Wilhelm Joseph von Schelling: "... der Baukunst als einer erstarrten Musik..." "...architecture is frozen music...") Unfortunately, the time factor of listening to music is missing entirely from this parallel when mentioned. Music acceptably owns and regulates time; we take it as an obvious consequence of listening to music that we have to spend the appropriate amount of time with it - it starts and finishes at certain points. Architecture or the built environment, on the other hand, even with its over-repeated connections to music, hardly receives any time from us. While the time span of listening to music fits easily within human measurements, the scale difference between an individual's and a building's life might be too much to contemplate. The erection, refurbishment, or destruction of a building are the phases closest to human scale. As such, taking part in a construction process helps us to share existential experiences with our built environment through taming the scale of its time-span into that of a human scale.[V]

The Chapel in the Woods was designed as part of the Saint James Pilgrim House (CZITA Architects / Tamás Czigány, Róbert Papp, András Cseh) For the guests of the Benedictine Archabbey of Pannonhalma, the chapel itself is an in-between space on the borderline of outside and inside, built and natural, material and space, darkness and light. We, the architects from the designer CZITA Architects office, built it together with a team of professional carpenters and a group of architecture students. The two-week long construction period was easily understandable on our human scale of time although the emotional intensity it required was sometimes at the edge of unbearable, especially compared to the two-year long design period prior to it. The quiet moments in the intervals between the construction work revealed a continuously changing yet constantly complete state of the structure, compressing infinite variations of a chapel in 14 days, allowing a palpably cognitive and extremely intensive spatial learning experience of space and time for us.

The existence between the erection and the destruction of a building is traditionally considered significantly longer than a human life; therefore, it is hardly comparable to our time-scale, so its

existence is taken for granted similar to the natural environment. To experience the wonders and the beauties of these given surroundings we take trips or short excursions where we focus on the features of the world with intensive attention. Basically, we go hiking or sight-seeing like we're going to a concert, but here we are based on our own rhythm instead of a given one. The cognition of natural phenomena is easily managed even on a subconscious level, already providing the feeling of understanding and beauty as well as the feeling of being at home, while dealing with the built environment requires an effort from the spectator. The built features bear the thoughts of their creators, the story of their past, and the activity of their users; they are a product of many layers, similar to music, where the composer's ideas, the musician's interpretation, the instrument itself, and even the environment the music is played in produces the experience of music itself.

Of course, we listen to music not just in concert halls but also in our everyday lives, usually with much less attention and care. However, we perceive our built environment without any such attention most of the time; hence, we don't train our senses and mind to discover the beauty and the potential of our surroundings. Architecture as a bearer of fulfilling qualities only emerges in extreme situations such as visiting famous buildings that are considered to be important by society, but we barely scratch the surface of understanding them and, therefore, the enjoyment we attain falls behind that which we could attain with a small amount of training.

However, in the beginning of our lives we are trained on the beginning of our lives about the importance of our surroundings since "Every movement may be regarded as a transformation of the perceptual field and every perceptual field as a group of relationships determined by movements." [49] and we constantly adopt and react to these changing perceptual fields. Learning is a natural, continuous state of being, the medium of our existence, which we accept subconsciously. However, after childhood, in talking about time consumption of an activity, we have assumed that an individual's conscious attention can focus on one thing. Recent research shows, however, that starting from Generation Y the general time and activity management in their lives is multitasking. (Generation Y is also known as the Millennials or the Millennial Generation and is the demographic cohort with birth years from the late 1970s to the early 2000s.) According to Annamária Tari, the members of this group are capable of talking to four to five individuals while surfing the Internet and listening to music simultaneously.[50] It seems to be a different, less intensive level of focusing attention; however, according to Tari, the situation is similar to the learning process of driving

Jean Piaget, Bärbel Inhelder: The Child's Conception of Space, Routledge & Kegan, 1956, p. 15 [49]

Annamária Tari: Y Generáció, Jaffa Kiadó, 2010, p. 30 [50]

whereby we start by focusing on various single things, such as changing the gears, before we develop a parallel sensibility and eventually become able to process all the different information and motoric gestures at the same time without any difficulties.

4.2 Awareness of Here

Husserl debates consciousness, as "In every actional cogito a radiating 'regard' is directed from the pure Ego toward the 'object' of the consciousness-correlate in question, to the physical thing, to the affair-complex, etc. and affects the very different kinds of consciousness of it." [51] Raising this consciousness towards the built environment is easy on the socio-cultural level, yet the conscious integration of a person into a space through perception in the Pallasmaa-ian sense is a more challenging task for the facilitator. Nevertheless, this segment of spatial and architectural education is the foundation that enhances both architectural and general learning processes and provides experiences of the existential human condition, resulting in a deeper understanding of the spatial (natural and built) environment and our connections to it. Self-reflective bodily experiences can help us reach this state of awareness, so developing tasks which place the participants in this situation (e.g. Instant Spaces, iBOAT) played an important role throughout the Pre Architectura programme.

The iBOAT task focuses on providing an intense experience of complete awareness of the self for the participating children. They build a boat that can float on the water with one of them in it, and they try it out in reality by rowing around in a nearby river or lake. Even though the result of this task appears to be the creation of an object, the test-rowing puts them in a position where they become intensely aware of their immediate surroundings thereby developing the skill of the previously mentioned egocentric stage in relation to the adaptive paradigm. Positioning the boat as a central object in the environment creates a focus point and by entering a symbiotic, co-dependent state when rowing, testing, and then modifying the boat, they start to pay attention to their own body and its connections to the proximate surroundings, such as the water, the shore, and the boat itself. The difference between this and rowing a ready-made boat is that here the testing and modification portion connects them to the boat as a familiar object, or almost as an extension of their body, and also empowers them through the experience of being capable of creating solutions to complicated real-scale and real-life challenges. Moreover, building the boat out of plastic bottles raises their awareness of sustainability and recycling as well. [W]

Edmund Husserl, Ideas Pertaining to a Pure Phenomenology and Phenomenological Philosophy, Volume I, §84, Martinus Nijhoff, 1983, p 200 [51]

The brave testing pilot of the iBOAT at MOKKA + Pre Architectura summer camp, 2012 [W]

Soft Skill Profiling Program, Széchenyi István University, 2014-2015 [52]

4.3 Symbiotic Relations

Instead of transmitting information to the students, the role of the teacher is to guide the social process of learning. The aim to facilitate children and students in leading a fulfilling life both personally and professionally has somehow slowly disappeared from the western education system even though individual teachers, or at most experimental schools, try to compensate for this lack of empathic studies. Spatial integration exercises also help us to focus on the connections between the self and its surroundings - not only on the factual elements of the environment itself, but also by creating attachments through involvement and developing human competences. This might seem to be less important in today's scientific educational environment; however, apart from our human needs, professional and economical market research appears to back up these so far alternative educational experiments.

Recent and on going studies [52] in human resources management show that out of the generally surveyed competences (self-competence, social competence, factual competence, and professional competence) employers increasingly tend to expect a higher level in the two basic human competences (self and social) assuming the necessary training of the employees in their expected specialised field of work in advance. Curricular educational strategies so far have failed to react to these changes in the professional market; therefore, extra-curricular training programmes that offer human competence development seem to be necessary. With minor yet structural changes in the school curricula, an educational evolution - either avoiding the underdevelopment of the students or starting a more drastic educational revolution - might be possible, and spatial learning strategies can function as the tools in this modification process.

We have to keep asking the fundamental question of education when developing the educational system and curricula: What is the expected outcome and how do we facilitate children in achieving that? The Pre Architectura programme is based on the initiative that providing students with knowledge of the appropriate amount of facts of either general or professional knowledge is only one part of education that needs to be integrated in a curious and open approach towards the full connection system of the environment and society.

Zoltán Szentkirályi's controversial categorisation of spatial studies can provide an interesting guideline to spatial learning as the model or tool of a person's symbiotic integration with the surrounding world. He divided the approaches in spatial research into four categories:

1. The topographic spatial approach deals with localisation and orientation through the topological and geometrical features of the environment and their coordinates correlated to the self as the original point of reference.
2. The escatologic spatial approach is tuned to the time dimension of space where the coexistence of space and time is as intensive as the coexistence of space and volume, an approach that is more perceptible to human beings today.
3. The intellectual spatial approach deals with the social, cultural, and historical layers of the world where the process is based on the cognitive procedures and thinking mechanisms projected onto the perceptible reality.
4. The rational spatial approach is a reaction-based active method that is focused on adaptation as a surviving and prospering behaviour in the environment of the previously recognised laws and principles.[53]

These four categories clearly explore spatial learning in accordance with the stages in the development of spatial knowledge and environmental cognition paradigms, and they also take a step further when considering conscious activity as a key element in the process. This conscious activity is the integrating quality of spatial learning that could complete the missing components in fact-based education connecting the personal competences with the learned features of the world into an entirely symbiotic system.

Spatial learning is also excellent grounds for social skills development. In many of the Pre Architectura workshops, children and architecture students from universities work in mixed groups for a range of additional benefits apart from the physical capacities of the group with a few stronger persons. Children connect more easily with younger people and receive a safer background to explore the unknown field of space and architecture. They also learn more than the previously forecast outputs of a workshop due to their constant communication with the students, who are already familiar with many aspects of architecture already. Students experience curiosity and openness on a previously forgotten level allowing them to approach their design tasks with a fresh attitude afterwards. They also have to communicate their pre existing architectural knowledge with a simple and understandable vocabulary for the children, thereby developing their communicational skills as architects, which will be crucial in establishing working relationships with clients during their practice later on.

Szentkirályi Zoltán: A térművészet történeti kategóriái,
in Válogatott Építészettörténeti és Elméleti Tanulmányok, TERC, 2006, p. 284-287 [53]

5.1 Peripheral Perception

In The Eyes of the Skin, Juhani Pallasmaa emphasises the importance of peripheral vision. "Unconscious peripheral perception transforms retinal gestalt into spatial and bodily experiences. Peripheral vision integrates us with space, while focused vision pushes us out of the space, making us mere spectators."[54] For further use of this perceptional event, let us call this integrating spatial sensation the Inner 3D, an experience where the borderline between the perception of the self and the perception of the surrounding world fades away. The experience resembles the way phenomenology discusses the act of perception: "When I observe an object, I continuously experience a world behind the seen thing; an existence which can not only be seen, but touched or heard - and there is not only the perceptible existence, but also a certain depth as the object's own that no sensual inquiry will conquer." [55] In addition to the phenomenological approach, the Inner 3D provides a strong sensation of the self and its connections to the surrounding and encompassing world through its closest layer to the self, the perceptible environment. It is significant to note that Pallasmaa's observations on this peripheral vision, or rather perception, are becoming the ordinary way of perception for the new generations of multitaskers, provoking educators to develop completely new strategies and learning facilities to adapt to these changes. Pallasmaa's observations on this peripheral vision, or rather perception, are becoming the ordinary way of perception for the new generations of multitaskers. On one hand, it is painfully difficult to accept that we rarely receive each other's full attention - a situation that teachers are faced with in the classroom nowadays. On the other hand, this result of a technical development places the next generation of human beings in a situation where they embrace more information from their surroundings with this marginal attention than the previous ones did with their occasional, focused sightseeing tours. The everyday reality of the so-called virtual world merges into the physical surroundings, where we are also subjected to an increasing amount of data that we process through peripheral perception. This operational procedure can be experienced by less recent generations when playing team sports in which the players lose control of the senses in order to perceive everything that is happening on the pitch. An expressive presentation of the intensive work of our senses and brain in this state is shown in the crossroad scenes of the otherwise average movie Premium Rush[56], which portrays a fixie bike messenger's decision-making process as he tries to get through Manhattan. (A fixie is a fixed-gear bike that has a drivetrain with no freewheel mechanism, which means that the rider has to pedal continuously. Brakes are rarely

Juhani Pallasmaa: The Eyes of the Skin, John Wiley & Sons, 2005, p. 13 [54]

Maurice Merleau-Ponty: Phénomenologie de la perception, Gallimard, 1945, Hungarian translation by Sándor Sajó, L'Harmattan, 2012, p. 240 [55]

David Koepp, Columbia Pictures, 2012 [56]

used, and the bike is stopped with the stopping of the wheel by holding the cogwheel with the pedals. Fixie riders prefer this construction because of the intensive connection with the bike and because of a different attention level to the environment; due to the difficult handling of slowing down and stopping, they use their peripheral perception intensely.)

The particular experience of the Inner 3D can be understood through the comparison of theatre and real life. Even in contemporary theatre, most plays make a clear distinction between the actor and the spectator, allowing the latter to perceive the story from an outside point of view and, therefore, with a consciously contemplative focused attention. In real life, such intensive focus rarely happens; instead, a rather blurred agent occurs as a field of multi-sensual perception with the parallel awareness of multiple targets, yet with less depth in the approach. The self makes a clear difference between being part of the world or looking at the world, and it changes the application of these approaches according to the challenges it faces.

5.2 (Re)Construction

The unconscious perception and evaluation of the environment is taken for granted as background noise in our life. However, if we consider the changes in lifestyle and living environment in the past century, we immediately realise the range and scale of changes human beings have been expected to follow. Compared to an ancient day's journey on foot, which was packed with enough impulses to occupy the attention of a human being, a day in contemporary life is burdened with information equivalent to a lifetime in previous generations. A higher level of multitasking and the lack of focused attention is a necessary evolutional process needed to cope with surroundings since we still have to sense ourselves in our environment and our connections to it. The continuous reconstruction of the virtual and physical environment requires an increased amount of subconscious attention, which widens the range of perception but decreases its intensity.

The How Big is a Tree? workshop at ARKKI[X] brought a slightly different result than on the previous occasions it was used. The acquired material was not enough to build a whole self-supporting structure, so participants suggested using one corner of the room as part of the personal hut they were building. The integration of the space the result stood in brought an intensive, close connection between the natural and the built with an additional layer of the time-dimension of architecture - the contrast between the ephemeral installation and the permanence of the building. According to the participants, the double nature of that corner made the experience

A Place in the Corner: Creating the Future 2.0 - [X] International Conference on Architecture Education for Children and Youth, Helsinki, 05/09/2014

”Az építészet “a többi műfajoktól eltérően ezt a valóságban fellelhető rendet nemcsak megmutatja, hanem emberi léptékre redukálva, az élet építészeti keretét alapvetően szervező tényleges térbeli rendként meg is teremti az ember körül, s így az állandóan ismétlődő élmény folyamatosságán, a megszokáson keresztül vezeti el az embert “saját” világának mélyebb megismeréséhez.”

Szentkirályi Zoltán: A térművészet történeti kategóriái,
in Válogatott Építészettörténeti és Elméleti Tanulmányok, TERC, 2006, p. 275 [57]

Claudio Magris: Danube, Európa Könyvkiadó, Budapest, 2011, translated by Mária Kajtár, p. 140 [58]

of perceptual reconstruction palpable when someone entered it. The outside form suggested a particular spatial quality, which transformed into something totally different after entering and facing the concrete corner and transformed again with the turning motion inside, which caused the intense integration of the visitor and converted the created structure into a visualised protective layer of the personal space.

5.3 Scale Matters (Space and Time)

Both appropriate time length and size of the created objects is required for spatial learning. Perceptual tasks discovering the environment, just like moving in space itself, take time. At the Pre Architectura workshops, children work with real-scale construction on a regular basis building something that surrounds them instead of standing in front of their eyes. When only making models, the perspective is close to a perpendicular projection leaving the spectator entirely out of the created world. In 1:1 human scale exercises, children use their peripheral vision, which enfolds them in space in a sensual experience, which becomes part of their world. Due to its scale, architecture plays a different role than any other art form as “it not only represents the apparent order of reality, but transforms it into a human scale and creates the actual spatial order, which arranges the architectural framing of life around a person, and hence leads the person to the deeper understanding of his ‘own’ world through the continuous repetition of the experience, routine itself.” [57]

Dealing with larger scale also means working with more serious materials and tools and mastering these provides a feeling of control and empowerment. Children become aware of their potential when altering their environment. Spatial learning takes them away from their virtual world of education and turns into everyday reality. The act of building, in terms of the ‘Learning By Boing’ form of architecture and spatial education, teaches about the spatial environment by definition and does it with a sensible touch of reality - something that has been missing from educational programmes in the past decades. “The mystery of things being created” [58] is stimulating and awakens our curiosity, yet the mystery of the things created by us is even more inspiring. Activity triggers an interesting environment for children more than mere perception and contemplation, which are mainly understood to be passive processes. However, after experiencing the inner event of gaining knowledge through activities, the conscious enjoyment of sensing and interpretation opens up providing a base for the development of knowledge and the desire for active perception.

Handling pallets to build Saint Ladislaus Castle, 2014 [Y]

1:1 scale also requires participants to step into the field of cooperation. Basically, the size and weight of materials and structures require more persons to work together. The experience of coordinating with others in co-dependent situations helps to form social competences improving their participation in teamwork, which is the method contemporary working environments require more and more frequently.[Y]

6.1 Learning By Doing - In Space

The medium of creation is fundamental in experiencing and understanding spaces, a process which provides the development of abstract reasoning skills. Simply by being unusual as a physically active task, building throws the children off balance from the routine of collecting data as the accepted way of learning. Spatial creation provides the grounds for intensive learning experiences; it allows us to interpret our familiar environment in different ways making the transformation between known and unknown in dramatic ways, where the usual environment becomes the bearer of infinite new details and the source of multiple layers of untold stories behind. Claudio Magris points out that "the biggest problem of all sciences is that it would need to collide the infinite waving blue of the southern seas with the blue on the maps on the southern seas".[59] In spatial creation, this difference between being itself and its interpretations meets on the borderline between science and art.

Learning usually surmises intentionality, thus providing meaning to the surrounding phenomena. "Meaning is the medium of intentionality, the medium, in or through which we are conscious of something."[60] However, consciousness enters into later phases of the learning process of a child on the condition of previously undergone subconscious learning processes that we also develop and use throughout our lives alongside the conscious level of education.

6.2 Subconscious Learning

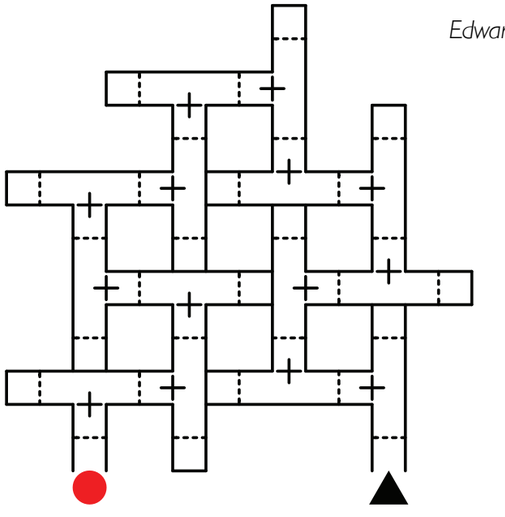
Spatial perception and orientation is based in the hippocampus, which is located in the medial temporal lobe of the brain. This brain component is also responsible for the consolidation of short-term memory into long-term memory.

The difference between declarative and procedural memory was made clear with cognitive neuropsychology in the famous H.M. case in 1953 when William Scoville performed brain surgery on Henry Gustav Molaison that led to damage in Molaison's hippocampus and resulted in his memory disorder. Molaison was studied throughout his life allowing neuroscientists to clarify the distinction between different types of memory and the areas of the temporal lobe processing sensory inputs and data.[61] H.M. was able to perform motoric tasks and could remember new data for a short time, yet he was unable to form long-term memories out of his experiences or form a cognitive map of his broader surroundings. His case provided the idea that it is the same

Claudio Magris: Danube, Hungarian translation by Mária Kajtár, Európa Könyvkiadó, Budapest, 2011, p. 40 [59]

David Woodruff Smith: Husserl, Routledge, 2007, p. 257 [60]

Heike Schmolck, Elizabeth A. Kensinger, Suzanne Corkin and Larry R. Squire: Semantic Knowledge in Patient H.M. and Other Patients With Bilateral Medial and Lateral Temporal Lobe Lesions; Wiley Liss, 2002 [61]



Edward C. Tolman: Cognitive Maps in Rats and Men, The Psychological Review, 55(4), p. 189-208. [62]

Layout of Edward C. Tolman's Labyrinth [Z]

On the Use of Flawed Formulas - Interview with Dirk Helbing by Michèle Wannaz; in Abstract N°12 White Noise, W. I. R. E. 2013 p. 18. [63]

Chess Palace 1. NAT, 2012 [64]

part of the brain, the hippocampus, that is responsible for spatial perception and cognition as well as turning short-term memories into long-term ones.

Edward C. Tolman's labyrinth studies with rats [62, Z] formed the basis of behavioural sciences. Tolman claimed that the previously accepted theories of learning, which assumed a basic stimulus-response connection at the learning event were incomplete. One group of rats were trained to solve the labyrinth with continuous reinforcement of food if they made the right decision of turns; they essentially learned to make the necessary steps to get rewarded, a process we call "path learning". Another group was left in the labyrinth without rewards to wander around and get to know their surroundings without obvious reinforcements, the latent learning process of "place learning". In the beginning, the former group had the quicker results, yet they were slow to adapt to any changes, while the second group started slower, but ended up with quicker results and with the capacity to adapt to changes.

Contemporary education schemes appear to follow "path learning", stating that the amount of data required is so large that students need to learn a given recipe in order to deal with every problem. However, in this time of big data, this strategy seems impossible. Data production exceeds the capacity of all data-processing systems [63], so it is untrue that we are able to learn the appropriate handling of occurring tasks. In this environment, the ability to weigh the perceivable stimuli and figure out a way to deal with it is increasingly important. This initiative is a creative process taking the given possibilities and making the most of them through experience and experimentation. Therefore, figuring out a way to introduce creative problem solving into education is crucial. Spatial learning based architecture education is an easy ground for this mixture of complementary data-collection and processing and can become the basis of further learning processes. The neurological background of this type of learning is that children activate and use previously stored data and begin to combine it strengthening and multiplying the connections between cells in their nervous system. The aim for such a way of learning produced chess-based education as well. Judit Polgár's international Chess Palace programme [64] uses chess as a framework for children in kindergartens and during their first years of school in order to teach everything from numbers to writing. After learning the very basic rules of chess, children start learning by playing and therefore in an experiential way. Although the program was introduced recently, the positive feedback from the schools that use it clearly shows the advantages of its strategy. Learning through space and architecture has an even more significant impact on the learning process because it requires less

White Noise - Why a data-driven society needs more common sense;
Abstract No12, W. I. R. E. 2013 [65]

abstraction from the children. Chess-based education requires knowledge be gained in an exotic setting that needs explanations to connect to everyday life, while this distance between life and learning in classical school lessons is almost imperceptible. In the world of the Internet with its infinite data and social networks, the school is gradually becoming the real virtual world. Learning about, and especially through, the environment could be the first step in revitalising school curricula because it offers knowledge in and from our everyday (supposedly already known, but at least familiar) surroundings - the built frame of our life Hence, our connection to it already exists.

The current issues of information and data handling in the world are neatly discussed in White Noise[65], a collection of articles, which introduce the rise of the data society and the means of dealing with big data. The general warning of the articles is to avoid the false sense of objectivity and completeness this data promises to provide and to hold on to our questioning abilities, as well as to human interpretation; otherwise, we risk falling into the routine of following self-fulfilling prophecies created by the impersonal entity that is data. Moreover, in a discussion, one can find any evidence to support completely contradictory opinions; therefore, if we look at one side only, it is easy to become convinced of anything, yet without trying to see the bigger picture with the other side of the coin, we easily end up compulsive without real connections to other people. The development of data to this extreme extent results in unforeseen possibilities, but also in unforeseen challenges with the growing responsibilities of using this data to make reasoned and matured decisions for ourselves.

Finding the balance in gathering information and turning it into knowledge through interpretation and intuition is becoming the key issue in current learning strategies. Factual overload is referred to as the pollution of the brain, in which we learn things that are totally indifferent to our prosperity. As such, the ability to handle the right amount of information is turning into an accentuated skill. Copying and repeating action-sequences that have worked well for ourselves or others eases the load of decisions, yet their obligatory use can result in an almost consciousless state of mind, refusing us entry to a fulfilling life. The previously mentioned example of learning how to drive a car is applicable to this balancing action between passive routine and active operation as well: in the beginning, it is difficult to pay attention to every detail and all of the happenings around us. We are continuously switching between peripheral and focused perception before becoming used to certain movements with the learned reactions becoming reflexes. Yet, in new situations, our original state of alertness arises again to weigh and deal with the circumstances. Even though we

consider both the assertive reflexes and the alert attention necessary qualities in a good driver, in our lives we tend to either follow routines continuously in order to be able to handle the load upon us, or we enter a hyperactive obsessive inventory attitude without the possibility of memorising and, hence, develop connections to things and people.

Recent studies [66] show that training the brain with adequate exercises for different parts increases neuroplasticity in all ages though with less significant results at older ages. Spatial learning develops the part of the brain that produces long-term memories and spatial navigation, the latter being the basis of all learning processes. According to the mere exposure effect, people establish a preference to things or processes simply because they are familiar with them. Through construction tasks, children become used to the sense of intensive learning experiences and find pleasure in more academic educational situations. Moreover, interestingly enough, "the stimuli perceived without awareness produce substantially larger exposure effects than do stimuli that are consciously perceived." [67] The double nature of spatial education in the aspect of unconscious and conscious learning processes is able to stimulate the minds of children on a more effective level.

A joint team from the University of Wisconsin-Madison and the University of Liège [68] recently developed a research to study into the flow of information through the cortex and found that when using our imagination, the direction of this flow is opposite between the higher-order and lower-order areas of the brain as opposed to during actual perception. Problem solving based on a recipe (path learning) allows our learning processes to work one way only switching between the perceptive and imaginative phases. However, spatial creation tasks (place learning) stimulate both our senses and imagination at the same time; hence, our brain is provided with an intense, simultaneous two-way traffic in the bottom-up and top-down connections of the brain. Reinforcing these connections through building processes allows us to interpret the challenges and possibilities of our environment on a more complete level; therefore, we become able to provide more precise and adequate reactions to them.

6.3 Making Mistakes

Creativity is a process where mistakes are allowed. "The power of working with doubt or suspending disbelief is fundamental for creative thought in science and in architecture." [69] The trial and error methodology that children use in their early learning processes accepts mistakes as its

Pasko Rakic: Neurogenesis in adult primate neocortex: an evaluation of the evidence, Nature Reviews Neuroscience 3, p. 65-71, 2002 [66]

Abstract of Robert F. Bornstein, Paul R. D'Agostino: Stimulus recognition and the mere exposure effect, in Journal of Personality and Social Psychology, Vol 63(4), 1992, p. 545-552 [67]

Reversal of cortical information flow during visual imagery as compared to visual perception; in NeuroImage Volume 100, 15 October 2014, p 237–243 [68]

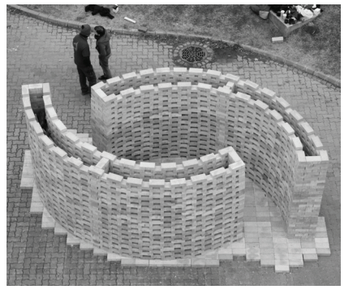
Steven Holl: Parallax, Princeton Architectural Press, 2000, p. 174 [69]

Ken Robinson: How schools kill creativity, TED2006, filmed 2006 [70]

Instant Spaces at MOKKA + Pre Architectura summer camp 2012 [AA]

basic principle. Yet, as revolutionary educator Sir Ken Robinson says: "I don't mean to say that being wrong is the same thing as being creative. What we do know is, if you're not prepared to be wrong, you'll never come up with anything original -- if you're not prepared to be wrong." [70] Nevertheless, in official education, even in kindergarten, learning is almost entirely considered to be adopting other's proven solutions to the challenges of the environment. This might be a necessary and successful process when we are facing known and recognisable situations, but insufficient when we encounter a complex set of new challenges. Embracing collective knowledge of the absolute is a logical and entropic solution in many cases; however, its role is appearing to decrease in the rapidly changing and relative environment of today through constant interaction, where so far unknown challenges and possibilities arise.

Instant Spaces is a playful workshop for children to experience various different spatial qualities with one simple tool: a large sheet of sheer. They use air to fill it and form it either by moving or by placing it in a windy place and while most of them holds the edges, some of them discover the instantaneous ephemeral spaces inside. Such use of the material itself bears an ambiguous quality of providing limited control over the created results, so children easily start playing with it and experience very intense and unusual spaces almost subconsciously, without worrying about exact ways of construction and therefore allowing space for trial and error, for real experimentation.[AA]



fireSPACE designed and built during Complex Building Design semester by architecture students for összTŰZ Festival 2011 [BB]

fireNEST at Hello Wood 2013 [CC]

My Home - Our Home task at MOKKA + Pre Architectura summer camp 2011 - photo by Tamás Czigány [DD]

Emmanuel Lévinas: Totality and Infinity, translated by Alphonso Lingis, Duquesne University Press, 1969, p. 195 [71]

Slavoj Žižek: Event - Philosophy in Transit, Penguin Books, 2014, p. 1 [72]

The differences and similarities of the one, the many, and the whole emerge from the act of construction, while the apparent importance of the two comes from our biological and human existence.

All construction processes include adding or subtracting elements to create a spatial structure. Modularity displays this phenomenon in an anthropomorphic way with the role of individuals and communities composing the more complex structure of society. While building, children are modelling their own behaviour, and if this is pointed out to them, they take one conscious step towards social responsibility.

There are three levels of modularity:

1. The modules are the smallest building elements: tűzHELY / firePLACE built by university students of 7th semester Complex Design I. and the children from the local elementary school in Hegyeshalom. Project leaders: Tamás Czigány, András Cseh [BB]

2. The modules are identical prefabricated elements: tűzFÉSZEK / fireNEST built by university students at Hello Wood 2013 workshop. Workshop leaders: András Cseh, Bálint Veres [CC]

3. The modules are a series of different elements connected either physically or theoretically: My Home - Our Home by children at Pre Architectura workshops [DD]

According to Lévinas [71], the appearance of the face of the other is the ultimate human experience that, due to its incomprehensible nature, challenges the individual to become alive through stepping out of the self. The self is under attack also during the course of building, especially in the large scale, when achieving the inner 3D - though here the self is rather partially dissolved by stepping into a world while it is being created and becoming a symbiotic part of it. The double identity here allows the creator and the creation to influence and form each other, so the actor is on both sides of the act - provocateur and spectator at the same time - while perception and reflection keep the process moving. The ethic that results from this event [72] overtakes the existence of the individual and focuses on the ability of sharing existence itself, so far with - or rather in - other entities. The obvious retreat from this personified conflict is palpable in today's virtual existence in the online communities which are built on parallel monologues rather than dialogues; we are provided with the feeling of belonging to others without the intruding presence of the other itself. Moreover, in opposition to physical reality, the existence of the other in the virtual space is in our hands on many levels.

According to András Visky, one of the leading theorists in contemporary Hungarian theatre, the act of theatre presumes three entities: "The actor and the role are not enough for the event to manifest - another one, the spectator, is necessary for any contemplation and understanding." [73] This trio is also based on contemplation and sharing similar to spatial creation, however, by placing two human beings in the equation. The experience of codependence in a community commonly happens in building exercises when one holds something until the other checks or fixes it, or even on more primal level, when a thing is too heavy for one person to carry. Coordination and simultaneous action are the basis of our coexistence, codependence, and, on a more socially sophisticated level, on our participation in the commons [74] balancing between the individual and the universal. Lévinas states that for only two individuals the whole spectrum of acknowledgement and responsibility could take place, but based on the traditions incepted in our plurality, we are bound to aim for an equilibrium of shared attention.

Heidegger talks about [75] the "disintegrated multiplicity of the disciplines" in the field of science, held together only by universities artificially after their roots "in their essential ground have died". The various sciences separate them due to their subjects and their methodology. At this point, knowledge becomes questionable, which causes us to also question education: Are we teaching parallel independent bundles of expertise that have hardly anything to do either with each other or the world itself? If we accept the unprocessable diversity as the reality for our life, then universities are the institutions that prevent the real flourishing and evolution. However, if our goal is still to understand the bigger, or in this case the whole, picture - as mankind have been aiming to do since the dawn of time - then we need to make the connections that universities do on a more general level starting earlier in education and as an integral part of our everyday lives.

When Howard Gardner presented his theory of multiple intelligences in Frames of Mind, he provided educational research with a tool unlike ever before clearly separating intelligence, domains, disciplines, learning styles, and sensory processes from each other.[76] Moreover, he differentiated seven (and due to following research later added another three) different intelligences a person uses while advancing in learning:

1. Logical-mathematical intelligence

2. Linguistic intelligence

3. Musical intelligence

4. Spatial intelligence

András Visky: The Many and the One, lecture, MOME, 11/16/2011 [73]

"We speak of "commons" every time a community of people is led by the same desire to take charge of a resource that it inherits or it creates and it organises itself in a democratic, friendly and responsible manner in order to ensure accessibility, usage and permanence for the general interest and the well-being of the community and of generations to come."

Alain Ambrosi, COMMONS Un-conference lecture, Pixelache, Helsinki, 06/05/2014 [74]

"Nur noch ein Gott kann uns retten" Das Spiegel-Gespräch mit Martin Heidegger, Der Spiegel 23/1976, p. 193-219 [75]

Howard Gardner: Reflections on Multiple Intelligences: Myths and Messages, in Phi Delta Kappan, 77, 1995, p. 200-209 [76]

5. Bodily-kinaesthetic intelligence

6. Interpersonal intelligence

7. Intrapersonal intelligence

+1. Naturalistic intelligence

+2. Existential intelligence

+3. Moral Intelligence [77, 78]

These intelligences relate to a person's unique aptitude, set of capabilities, and the ways they might be able to demonstrate intellectual abilities on their highest level. The focus of Gardner's research steered attention from general learning concepts to the individual learner, raising the human potential, a "capacity, with its component processes, that is geared to a specific content in the world" [79] to a primary position in the learning process and its analysis.

Gardner's multiple intelligences theory reinforces the spatial learning methodology of the Pre Architectura research, which aims to provide the missing underlying segments of a holistic learning approach, particularly in the realm of spatial, bodily-kinaesthetic interpersonal and intrapersonal intelligences, but also in providing the fundamentals for further developments of existential and moral intelligences.

7.1 Elemental Systems

Elemental systems are a comprehensible articulation of certain elements themselves and the connection between them. Physical attributes, such as materials, become a focus-point when finding the appropriate joints between two elements.

The key role of the "How big is a tree?" workshop is to discover natural and artificial existence and rules of structures based on elements. Children get acquainted with a small tree, studying all of its features and their junctures; they decide which parts can be considered distinctively defined elements and take the tree apart accordingly. The different types of elements (e.g. yields, leaves, branches, trunks) are collected separately and measured afterwards. Turning from subtraction to addition, the two basic acts found in elemental systems, the children start building a structure out of the elements discovering necessary new ways of connecting them. The goal is to achieve the same height and/or width of the original tree.

from Howard Gardner: Frames of Mind - The Theory of Multiple Intelligences, Basic Books, 1993 [77]
and Howard Gardner, Thomas Hatch: Multiple Intelligences Go to School - Educational Implications of the Theory of Multiple Intelligences in Educational Researcher, Vol. 18, No. 8, American Educational Research Association, 1989, p. 4-10 [78]

Howard Gardner: Reflections on Multiple Intelligences: Myths and Messages, in Phi Delta Kappan, 77, 1995, p. 203 [79]

How Big is a Tree? workshop at the Building Games Conference in Budapest 2013 [EE]

Helsinki, Finland, 05/08-09/2014 [80]

Bucharest, Romania, 11/15/2014 [81]

How Big is a Tree? is an architecture education workshop with multiple outputs developed during the Pre Architectura practical research programme. First, it was a one-day summer camp task for children though after the presentation of its process and results, it gained national and international attention in the field of architecture education for children due to its ability to measure and develop personal, social, and methodological competencies and hence to provide a good background for further learning processes.

In the past years, after its success at the Építő Játékok / Building Games Conference in Budapest [EE] (09/24-25/2013) the task was slightly altered to create an introductory workshop in architecture/ spatial education for architects, drawing and art teachers, and visual culture educators because it connects to them easily and gives spatial creation experiences without the overwhelming verbal or visual use of architectural jargon. It was also part of the programme at the Creating the Future 2.0 - International Conference on Architecture Education for Children and Youth [80], one of the key global events in this field organised by ARKKI School of Architecture for Children and Youth, which is the founding institution of architectural education, research, and practice for children. The leading Romanian organisation of this field, De-a Arhitectura, also invited a presentation of the workshop at the De-a Architectura Talks 1., the first national and international conference about architecture education for children in Romania.[81] The reception was unexpectedly positive, and after some negotiation, it appears that the How Big is a Tree? task will be part the official training program for children's visual and architectural educators in the Romanian system.

In different parts of the task participants learn about...

a. ...themselves, while having a close encounter with a tree/bush in their minds.

By sitting down in a circle in the classroom - learning that everything is forming space.

By thinking about a tree/bush - learning about the richness of our imagination.

By discussing a tree/bush - learning about our differences and the complementary qualities towards each other.

b. ...natural structures, while having a close encounter with a tree/bush - in reality.

By going to the woods - learning about the connection between natural and built environments.

By looking around for the appropriate tree/bush - learning about collecting data.

By choosing one tree/bush - learning about weighing our options

and making decisions as a group.

c. ...anthropomorphic measurements, while comparing themselves with the tree/bush.

By measuring it by themselves - learning about scale, size,
and anthropometric measurement units.
By digging it out - learning about a tree's natural structure (and the use of a spade).
By taking it home - learning about logistics and the weight of things.

d. ...projection, while taking the tree/bush inside their built environment.

By fitting the tree/bush in a room - learning about our senses tricking us in size and scale
and about what is considered trash where.
By casting strong light beams upon it from different points - learning about projection.
By putting it in a corner - learning about the idea behind the Monge Projection
and the representation of architectural forms on paper.

e. ...drawings, while mapping and recording the tree/bush.

By drawing the outlines of its shadows - learning about plans and elevations.
By removing and re-imagining it according to the drawings - learning about the possibilities
of our minds and the working methods they could follow as architects.

f. ...elements, while taking the tree/bush apart.

By cutting, sawing, tearing it into bits - learning about how to use different tools.
By taking off one kind of an element at a time - learning about the role of each element
in a structure and the connections between them that form a system.
By piling up yields, leaves, branches, trunks - learning about the complexity of an otherwise
usual and simple thing from their environment.

g. ...geometry, while arranging the different elements according to their qualities.

By laying the branches one after the other - learning about lines.
By laying the leaves next to each other - learning about planes.
By piling up yields - learning about volumes.

h. ...artificial measurements, while measuring the tree elements exactly.

By measuring the parts according to their geometrical properties - learning about length,
area, and volume.
By measuring everything using our official measurements - learning about comparability.
By making a list of its properties - learning about different qualities.

i. ...built structures, while designing and building a new structure.

By building up the structure - learning about load bearing, rigidity, and architectonics.

By binding the elements together - learning about joints.

By helping each other during construction - learning about teamwork.

By using all the elements of the tree - learning about waste and sustainability.

By trying to create an interior space for one - learning about scale, our size, and spatial needs.

By trying to reach the tree's/bush's former size - learning about the physical laws and wisdom of nature.

By reaching its former size (at least in one direction) - learning about the empowerment of man.

7.2 Thinking Lego

The two basic space-making acts are subtraction and addition. Subtraction provides space through carving out material from a larger volume, such as caves, and usually results in rather homogenous boundaries of space. This way of spatial creation is more rarely used in architecture. However, in architecture education, subtraction as a modelling technique plays a significant role in small-scale models, where building out of elements would be unwise and unnecessarily time-consuming. In real-scale experiments, subtraction hardly appears because it requires a larger amount of and more specific material.

Addition is the extension of something either by repetition or with added layers. Both in modelling and in building construction, addition has been the more often applied technique for space making. In architecture education, its role is to introduce the laws of repetition and the connections between the elements of construction and also to provide students with tools for real-scale spatial experiments, discovering modularity, uniformity, and reversibility in architecture through these elemental systems. The use of a series of identical elements appears from the level of materials (e.g. bricks) [FF] through building elements (e.g. columns) and whole buildings (e.g. traditional vernacular architecture) [GG] to the extent of urban tissue (e.g. a quarter of block houses); therefore, the understanding of how elemental systems work is essential in the process of becoming an architect.

Church, Újrónafő, 2014 by CZITA Architects (Tamás Czigány, András Cseh, András Nagy) photo by Tamás Czigány [FF]

Saint James Pilgrim House, Pannonhalma, 2010 by CZITA Architects (Tamás Czigány, Róbert Papp, András Cseh) [GG]

Smart phone, smart bomb, smart city - Interview with Adam Greenfield by Hannes Grassegger
in Abstract No12 White Noise, W. I. R. E. 2013 p. 37 [82]

7.3 The City as the Ultimate Whole

"A city's central function is exposing us to diversity. It's the job of a city to make us fully human. And we become fully human by moving in an environment in which contestation and negotiation are constants of everyday life. And as we are exposed to an extremely high number of people who share maybe very, very little with us. They might not speak the same language, have the same politics, might not eat the same food or hold to the same fundamental beliefs regarding the nature of the universe as we do. And yet we are all in this giant machine together. And we have to come up with a way to not only coexist but even thrive together. My own personal definition of the function of a city is based on the psychic potential of life in the urban environment." [82]

It is interesting to compare the first step from the self towards the other within Lévinas and Adam Greenfield's thought of the ultimate human presence as part of system that is full of unknown elements for the individual. Based on this narrative, in the city we always perceive in inner 3D; not only in space, but in many other aspects too (social, cultural, etc.). Instead of peripheral vision, we have to introduce the term of peripheral perception, which includes all of our senses. When walking around the city, we open up to the multi-sensory environment and experience a different awareness of here than that of the almost meditative movement tasks in the classroom. Our connections and reactions to the environment start to define our presence. On this level, the socio-cultural forces paradigm of environmental cognition provides the premium level of perception, and we move back through the opportunity structure paradigm to the adaptive paradigm in a process in opposite direction to our early childhood learning development.

Here the spatial environment provides the connecting medium of the historical, cultural, social, and scientific layers of our life allowing a synthesis of general knowledge that could easily be used in education. The connection of the individual with the objects of learning becomes experiential in a setting that not only allows but requires multi-tasking from the participant. The city as a learning ground physically models the data-procession and decision-making events children are used to in their so-called virtual reality, a presence whose translation for the older generations is necessary for communication in teaching and learning today. Alas, simply going to the city for learning activities provides the common ground and language for teachers and students on the borderline of the formal and informal - a situation that is missing from education - while it is obviously necessary in a learning process in a democratic world.

Juhani Pallasmaa: The Eyes of the Skin, John Wiley & Sons, 2005, p. 13 [83]

"Buildings and cities provide the horizon for understanding and confronting the human existential condition." [83] This revelation presents a key event on different social scales. Spatial education is able to connect seemingly distant areas of our personal lives, and it also improves systematic skills for handling the surrounding challenges. A deeper understanding of the human existential condition leads to a more accurate analysis of our situation in the world; hence, it can provide a starting point for the development of future strategies concerning not only our survival, but also our well-being as human beings, persons, and communities as well.

A Pre Architectura - Térbeli Tanulás kutatás tézisei néhány esetben evidens megállapításoknak tűnhetnek. Megfogalmazásuk a kutatás során mégis szükségszerűnek bizonyult, mert ezek az alapgondolatok a gyermekek építészeti oktatásával foglalkozó hazai és nemzetközi szakirodalomban nem, vagy elhanyagolható módon és helyen jelennek meg, sok esetben az építészetoktatás meglévő oktatási rendszerekbe történő könnyebb integrációja elérése érdekében.

1. *Az építészeti tudás alapjának, a térnek megismerését szolgáló tanulási folyamatok térbeli érzékelési és alkotási feladatokon keresztül valósíthatók meg. Az építés, mint az építészet és a térbeli tanulás "Learning By Doing" formája definíciójából eredően a térbeli környezet tanítását hordozza.*

2. *A térbeli tanulás, mint aktív tevékenység a legtöbb tanulási folyamat alapját képezi. A térbeli tudás és környezeti kogníció fejlesztése úgy alakítja az agy barázdáltságát, hogy az pozitív hatással van mind a logika, mind a memória fejlődésére, ezért a térbeli tanulási folyamatok alapvető fontosságúak a későbbi tanulási folyamatok előkészítéseként. A térbeli érzékelés és értelmezés a hippokampuszban történik, amely agyterület az információk rövidtávúból hosszútávú memóriává alakításáért is felelős. A hippokampusz az ember egész élete során fejlődik, ezért a térbeli tanulási gyakorlatok minden korosztály számára hasznos, fejlesztő jelleggel bírnak.*

3. *Az építészet megtapasztalása jelentős időt vesz igénybe és aktív részvételt követel a folyamat szereplőitől. Környezetünket alapvetően azonnali impulzusként érzékeljük, de a minket körülvevő közeg folyamatos rekonstrukciója és rétegeinek vizsgálata érzékelhető időt vesz igénybe és mind tudattalan, mind tudatos aktivitást feltételez a szemlélő/cselekvő részéről.*

4. *A 'Belső 3D' észlelése, amely során a vizsgáló személy önmagát a környező térbe integrálva érzékeli különbözik a 'Külső 3D' észlelésétől, amely során a vizsgáló személy egy külső nézőpontba helyezkedve a térbeli vizsgálat tárgyát kívülről szemléli. A valós, 1:1-es léptékű térbeli érzékelési és építési feladatok, amelyek során a vizsgálót körülveszi az általa megfigyelt és/vagy alkotott tér, a 'Belső 3D' megélésén keresztül intenzív tanulási eseményként működnek, megtapasztalhatóvá téve a tanulás, mint a nem-tudásból tudásba váltás alapélményét, amely a kortárs oktatási stratégiákban jellemzően nem kap megfelelően hangsúlyos szerepet.*

5. *A térfilozófia és médiumfilozófia vizsgálati rendszerei eddig kiaknázatlan megfigyelési és értelmezési lehetőségeket biztosítanak a térbeli tanulási folyamatok kutatásához. A környező világ alapvető törvényszerűségeinek az ember és az őt körülvevő közeg vizsgálatán keresztül történő megismerésére tett kísérletek a filozófiában: mind klasszikus filozófiai szövegek (pl.: Platón:*

Some of the theses of Pre Architectura are seemingly evident declarations. However, probably due to the general aim of acceptance in education-policies, these basic statements are so far absent from the literature of spatial learning and architecture education for children; therefore, their articulation appears to be essential.

1. Spatial learning, which is the essence of all architectural knowledge, effectively happens through spatial perception and creation tasks. Building, in terms of the 'Learning By Doing' form of architecture and spatial education, teaches about the spatial environment by definition.

2. Spatial learning as an activity provides the foundation of most learning processes. The development of spatial knowledge and environmental cognition develop the structure of the brain improving both the logic and memory system, and, therefore, are essential as the starting point of further learning processes. Spatial cognition happens in the hippocampus, which is also responsible for processing short-term memories into long-term memories. Since the hippocampus can develop throughout the entire lifetime of a human being, spatial learning exercises are beneficial at all ages.

3. Experiencing architecture takes significant time and requires active participation from the participating person. Even though we perceive our built environment as instantaneous impulses, the process of reconstructing the surrounding space and understanding its layers consumes time and demands both unconscious and conscious work from the participant.

4. The cognition of an 'Inner 3D', when the self experiences its integration in the surrounding space, is different than the cognition of an 'Outer 3D', when the self is looking at the space from an exterior point of view. The spatial learning tasks and building in real scale, where the participant is surrounded by the space being discovered or created, provide the grounds for experiencing the 'Inner 3D' with an intensity of the learning event - the change from not-knowing to knowing as the ultimate human event, which is hardly present in contemporary educational curricula.

5. Space-philosophy and medium-philosophy provide yet undiscovered interpretations and guidelines in understanding spatial learning processes. The initiatives of philosophy have always been geared towards a deeper understanding of the world through the analysis of human existence in the agent and medium of its surroundings. The systematic structures of

Timaiosz vagy Martin Heidegger: A műalkotás eredete), mind a fenomenológia fejlődése (Maurice Merleau-Ponty), mind a szándékosság (Intensionality; Edmund Husserl) és az esemény (Event; Slavoj Žižek) jelenségének filozófiai vizsgálata megtermékenyítő mintákkal és párhuzamokkal szolgál a térbeli tanulási folyamatok vizsgálatához és megértéséhez.

6. *A térbeli környezet megismerésének folyamata adekvát és effektív eszköz a magának a tanulási folyamatnak és a tudás-megszerzés élményének megtapasztalására, mert a mindennapos tárgyi és térbeli környezet megszokottsága és a benne rejlő extrém lehetőségek felfedezése olyan kontrasztot alkot, amely könnyen előhívja a tanulásban bekövetkező Aha-effektust és így élményszerűen megélhetővé teszi a tanulás eseményét, előhívva egy olyan élményt, amely a multitasking alapon működő új generációk számára egyre ritkább tapasztalat. A térbeli tanulás különböző szinteken fejleszt: fiziológiai szinten a hippokampusz stimulálásával, pszichológiai szinten a helytanulási képességek fejlesztésével az útvonaltanulással szemben és motivációs szinten a feladatok során a tanulás, mint élmény megtapasztalásának előidézésével.*

7. *Gyerekek és egyetemi építész hallgatók közös részvétele a térbeli tanulási feladatokban több szempontból is jelentős eredményeket hordoz. A gyerekekben meglévő nyitottság és kíváncsiság és a hallgatók építészeti tudásának konfrontációja a meglévő formális tudás és a kreativitás kombinált használatát eredményezi, kiegészítve a jelenleg működő iskolai és egyetemi oktatási stratégiákat.*

8. *A térbeli tanulás és az építészeti oktatás során szükséges építészek jelenléte. A térbeli tanulási folyamatok a környezet megismerését és megértését célozzák az építészet médiumán, a téren keresztül, amely a művészetektől és tudományoktól sok esetben különböző, egyedi tulajdonságokkal bír. Az épített környezeti nevelés valamely szintjén - vagy közvetlenül a gyerekek oktatásában vagy a tanárok és facilitátorok képzésében - elengedhetetlen építészek aktív részvétele, mert az ő számukra ismertek és ismerősek a tér tulajdonságai és a benne rejlő lehetőségek.*

philosophical classics (e.g. Platon: Timaeus, Martin Heidegger: The Origin of the Work of Art), as well as the development of phenomenology (Maurice Merleau-Ponty), the explorations of intentionality (Edmund Husserl), and the initiatives of evental philosophy (Slavoj Žižek), have parallel observations to spatial learning processes.

6. Discovering the spatial environment is an adequate and effective tool for teaching the learning process itself because the contrast between the familiar and the new therein easily triggers the Aha Moment, the learning event itself, which in new generations, who are used to multiple sensory irritation, is hardly within reach any more. Spatial exercises are applicable on many levels: physiologically, through stimulating the development of the hippocampus; psychologically, through space-learning instead of path-learning; and motivationally, due to the joy-experiences of gaining knowledge through the exercises.

7. The co-operation of children and university students of architecture in spatial learning is beneficial for all participants on multiple levels in the current educational schemes. The confrontation of the children's open curiosity and the students' academic architectural knowledge results in a productive combination of knowledge and creativity, completing the existing curricula both on elementary school and university levels.

8. The presence of architects is necessary in spatial and architectural education. Spatial learning processes target understanding of the surroundings through the medium of architecture: space, which exhibits particular properties unlike any other field of arts or sciences. On some level of built environment education - either by teaching the children directly or educating the teachers and facilitators - the involvement of architects is indispensable as they are accustomed to the attributes and possibilities of space, a realm, which is hardly approachable for those who are not trained in architecture.

A Pre Architectura - Térbeli Tanulás programja az építész mindennapok nehézségeiből indult, azt célozva, hogy egy értőbb megrendelői közeg nevelésében vállaljon szerepet. Az első lépések azonban már magának a tanulási folyamatnak a vizsgálata került a középpontba és annak kifejtése, hogy a térbeli tanulási folyamatok hogyan egészíthetik ki tudásunkat és teljesíthetik ki életünket.

A Moholy-Nagy Művészeti Egyetem Doktori Iskolája összes oktatójának és hallgatójának hálás vagyok, hogy bíztattak az építészet biztosabb talajának elhagyására és támogattak abban a törekvésemben, hogy a tér szabad felfedezésén alapuló tanulási folyamatokat vizsgáljak, azokon a tanulási eseményeken keresztül, amelyek során a gyerekek válaszai megerősítették vagy megcáfolták az elméleti megközelítés helyességét. Göde András témavezetőmnek külön köszönöm, hogy kíváncsiságával és kritikai támogatásával segített egyensúlyozni az elmélet és a gyakorlat határán, amely ebben az esetben elengedhetetlen módszernek bizonyult.

Az ARKKI School of Architecture of Children and Youth gyermekek számára létesített építészetoktatási iskolának és vezetőjének, Pihla Meskanennek köszönöm, hogy felhívta a figyelmemet a 'Learning By Doing' elv, a csinálás fontosságára.

Váray Ibolyával és a MOKKA Modern Képzőművészeti Kreatív Alkotóműhellyel közösen sok különböző foglalkozást és tábort szerveztünk, amelyek a kutatás gyakorlati terepének alapjául szolgáltak. Az ő pedagógiai tapasztalataik a művészeti oktatás terén, valamint a programokról az építészgondolkodástól eltérő szemszögből megfogalmazott kritikájuk segített elkerülni a szakbarbár megközelítést és a feladatok fejlesztése során megtermékenyítő impulzusokat adott.

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The Pre Architectura - Learning Through Space research started from a purely architectural point of view, as a built environment education programme to build up a more understanding structure of clients. Nevertheless, the first steps already lead to the investigation of learning processes in general and the particular method that spatial learning contributes to the development of knowledge and wisdom throughout one's life.

I am grateful for the support of the entire team of lecturers, tutors, and fellow students at the Doctoral School of Moholy-Nagy University of Arts and Design, who encouraged me to leave the safer ground of architecture and seize the opportunities laying in the completely open exploration of space as a learning process, an approach which was continuously strengthened by the children who participated in the organised events. András Göde, my supervisor, accompanied me with a mixture of support and critique that was a necessary combination to balance this research on the borderline of theory and practice, academic work, and experimental play.

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To the best of my knowledge, this thesis contains no copy or paraphrase of work published by another person, except where duly acknowledged in the text. This thesis contains no material previously presented for a degree at the Moholy-Nagy University of Arts and Design or any other university.

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Professional experience

2006- CZITA Architects, Győr / intern

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Buildings

2010 Saint James Pilgrim House and Chapel in the Forest, Pannonhalma
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2010 Complex Accessibility Design for Czuczor Gergely Benedictian Gymnasium, Győr, together with Tamás Czigány and Györgyi Tóth

2011 Porta Pacis, Abbey Visitors Centre, Tihany
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2011 Hunyadi Mátyás Technical College, Mosonmagyaróvár
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2013 Archabbey Bookshop and Reception, Pannonhalma
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2014 Abbey Manor Visitors Centre and Regional Exhibition Space, Pannonhalma
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2014 Catholic Church, Újrónafő
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Competitions

2006 Sport- and Leisure Centre on Molnár-Island, Budapest / shortlisted
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as CZITA Architects

2007 Csillag Erőd International Art Centre, Komárom / shortlisted
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2007 Inno-Raab International Knowledge Centre, Győr / 2nd Prize
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2007 Bispetorvet, Århus, Denmark / 2nd round

2010 320° Art, Education and Technology Centre, Siófok / shortlisted
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2010 Hungarian Wall Sticker for Hellodesign / 3rd Prize
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2011 Bárány Swimming Centre reconstruction, Eger / 2nd Prize
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Awards

Media Prize 2011

hg. hu Design Award 2011 / shortlisted

AIT Award 2012

- Global Award for the very best in Interior and Architecture 2012 - Sacred Buildings

Pro Architectura Prize 2012

Detail Prize 2012 / shortlisted

Exhibitions

2011 World Architects Exhibition, The 24th World Congress of Architecture, UIA2011
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2011 Contemporary Architecture in Pannonhalma (Kortárs építészet Pannonhalmán)
Benedictine Archabbey, Pannonhalma, Hungary

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FUGA Budapest Centre of Architecture, Budapest, Hungary

2012 Hungarian-Portuguese Architecture Parallels
Székelyudvarhely, Romania

2012 AIT Award 2012 - The Exhibition,
AIT ArchitekturSalon, München, Germany

2012 Pro Architectura 2012 Exhibition
Hungarian Architects' House / Magyar Építészek Háza, Budapest, Hungary

2013 Two Chapels (Két kápolna)
Benedictine Archabbey, Pannonhalma, Hungary

2015 Our Churches Yesterday and Today (Templomaink tegnap és ma)
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Workshops, installations:

Thicket (Rengeteg) - Hello Wood, Csórompuszta, 2011
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Innovative Use of Wood in Construction 1. - Joensuu, Finland, 2012
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Innovative Use of Wood in Construction 2. - Győr, Hungary, 2013
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