# Built Environment Education as Intervention: Making Visual Education More Transdisciplinary

Gabriella Pataky[1], Judit Skaliczki[2]

[1]Eötvös-Loránd-University Faculty of Primary and Pre-School Education,
Department of Visual Education, Budapest;

[2]Budapest University of Technology and Economics Faculty of Architecture

## Abstract

**Built Environment Education as Intervention: Making Visual Education More Transdisciplinary**

**Built Environment Education, strongly linked to visual education, is that special area of instruction which engages with the theory and practice of the deliverance of knowledge of the built environment, as well as with the strengthening of the connection between people and their own life-space. In contrast to passive observation, this kind of intervention inspires critical and analytical reception, and the analysis of the various environmental stimuli. The proactive, creative perspective developed in this way contributes to the acquisition of the appropriate skills for the creation of common life-space. Education in the discipline of Architecture has evolved, mirroring societal challenges and conditions. Built environment education can also be considered as a multitude of traditions with different national flavors. New social challenges address architectural education.**

The currently widespread design studio model is almost exclusively based on the end products and artefacts, without taking the cognition processes themselves into consideration (Oxman, 1999). In terms of valuation method, the same problems arise as in visual education (Pataky, 2011). Evaluation is product-based; knowledge growth and the level of development are not defined by any method, nor are they taken into account.

With the elaboration of an evaluation system, the studio work could become more efficient and individually customized, where each student could have her/his education based on personal needs. By applying such a system, we could monitor the evolution of construction skills, continuously comparing the results with research done on younger age groups.

Our aim is to define the competencies, in the light of the ENViL CEFR_VL, and the level that all students need to possess in order to be successful in architectural and design studies. We seek to set up a visual capability measuring system of manual exercises, which could support the preliminary examinations at admission, as well as the first-year education programme, providing a suitable basis for subsequent design skills, which are the key to facing future professional challenges.

## Keywords

Our talk today concerns the development of architectural competencies in children, early childhood education students, and architecture students. I will be presenting the measuring instruments and the initial results of our ongoing action research project. The context for this project is formed by research on the development of constructive (Gaul, 2001, Pataky, 2011.2012 a,b) and spatial (Pataky, 2016,2017) capabilities, as reflected in the development of drawing skills among 3/6/12-year-old children: at what age, how and with what effectiveness are visual capabilities developable, and how do they develop on their own?

**The Study's Basic Proposition**

At the center of this research lies the more detailed recognition of the activity of building, in a broader sense. It strives to take into account the instinctive activity of building in early childhood—which carries within itself the possibility of knowledge of the world—and the possibilities of the functioning, evolution and developability of the conscious planning attitude characteristic of architects. The goal of the current phase of the research has been to make these two disparate ages and their developmental characteristics comparable, in the form of practical results. We have been motivated by the proposition that in both of these age cohorts there is the same kind of learning process, of development of capabilities, in which parallels and similarities can be discovered. These propositions are based on the one hand on our own observations, and on the other are inspired by the experiences of earlier international research (Gura, 1992).

**Assessment Groups**

A diagnostic set of exercises serves as the instrument for practical verification of the research propositions. To this end I created a system consisting of various measurement exercises, which I first calibrated on a pilot group of architecture students, and thereafter carried out among early childhood education students and kindergarten pupils. The brief, constructive exercises were prepared with the use of easily available, commonly known materials (building blocks, cards,

paper strips, skewers).

## Theoretical Background I: Educational Games – Fröbel

The evaluative perspectives were grounded in this model, to which we oriented ourselves. According to Gura's assessments (Gura, 1992), spontaneous development takes place in a linear fashion.

We considered the above stages in formulating our evaluative perspectives for the diagnostic condition survey and the examination of the initial capabilities used for comparison. This applies to the observable development of the individual subjects themselves, as well as to the comparison of that experienced in subject groups.

Linear construction, surface construction (in the case of exploratory builders, collecting first experiences) Development continues with enclosures and forms with encirclements and doors. Complex spatial configurations (Here the material is no longer a restriction; this stage presumes an experienced builder/constructor.)

### The alcove – architectural archetype

Why alcove? It is an architectural archetype connected to deeply held images within ourselves. The space that provides security, the building of shelter appears in countless examples in every layer of the history of culture and of the arts.

### Assessment Perspectives

We established our research questions and our stock of elements of competence mobilized in the investigation on the basis of the ENViL CEFR_VL prototype. System of Competencies: Composition of Forms, Manipulations, Configuration of Space, Creativity, Configuration of Materials and Use of Instruments

Partial Results Proceeding by Material

# I. Solid Blocks

Similar to Fröbel's system, we move from the whole towards the particular:

- From the body-like

- Plane, surface-like, cards

- Paper strips, surface but not stiff to the linearity of skewers.

Some results from examples in the data collected: 1st dimension: Parallel – Building in a row, in one line. The following images show the work of children on the left side and early education students on the right; the architectural students don't figure here in the comparison, but in characteristic cases some of their works will be shown for contrast.

Returning to the evaluative scheme, we can establish:

We find an example of every dimension, with a very large deviation, which is natural in the case of children (4-6-year-olds), but in the case of the young adults is food for thought, since there was no further development, while the examined competencies are so important for everyday success. We observed in many young adults that they got stuck at the level of the example given by Gura (Gura, 1992) and didn't proceed further. In the optimization of the educational circumstances for visual competency there is much room for development!

2nd dimension: Parallel – Making enclosures – inside and outside – Enclosure

There are here already prototypes and experiences, but it doesn't go beyond the concepts of outside and inside.

3rd dimension: Parallel – Complex spatial arrangements – Complex Constructions

While the great majority of the children create multifaceted constructions completely naturally, the early education students hardly do. Where do the childhood experiences disappear to at the age of 18? Is it not enough that visual capabilities are demonstrably weaker than they were

40 years ago, without the experiences already gained also fading away? In light of the facts, the lessons of the research are very important, while public education bears a great responsibility!

Differences – We asked for regular constructions, and, following that, the students primarily exhibited rigid symmetry. The children dealt with regularness in a much more open-minded way! Special features: the children considered regularness freely, from the point of view of use functions (see for example the panther placed in the construction) and didn't insist on a rigid order. The future early childhood educators utilized strict symmetry, pyramids, entrances and „imperial excavators".

**Flexible Scale**

Differences – changes in scale were discernible only on the part of the children. On the part of the students, the constancy of scale was unambiguous: the block functioned as the unit of building material. The children flexibly switched around in 5-6 different constructions, using different scales time and time again.

Pay attention in the example to the landing, recognizable from children's narratives, or the fairies' entrance. The dimensions, scale and proportions are flexible and cover a wide spectrum; for the future early childhood educators along with the constancy of scale, the imagination doesn't take flight.

## II. Paper/Surface

The participants got 15 stiff cards of identical size, notched and usable for assembly. In the case of both groups, the form appearing most often was a two-dimensional enclosure. Very similarly this forms the middle category from the evaluative rubric.

In the case of kindergartners: in many cases the process of getting acquainted with the components and experimenting with the modes of connection resulted in less complex con-

structions, however in this the children showed creativity. Experimentation, investigation and the collection of experience are all apparent here, which are more important for the children than the results.

Architect Students: block- and mass-like forms appeared, the connection of components was not a problem, but unambiguous building elements emerged—limiting walls and roof elements. The big challenge was how to use the components.

Teacher Training Students: area coverage—where classic roof elements weren't utilizable, basic shelter-building instincts and organic use of elements appeared—as if they were working with banana leaves . . . Those who technically couldn't achieve this still showed an inclination to put a roof on top.

Examples that don't fit, for a sense of perspective: a stark contrast with the banana leaves.

Architectural students: particularly creative use of components is apparent. (This is attributable to the motivation to get into the training program and to its character, but that also shows that there is room for improvement for everybody!)

## III. Paper Strips: 3 Pieces per Person

It is clearly visible that the children find it difficult to complete this assignment in a way that separates them from the mass. The formation of the material caused the most problems. The effect of socialization is also obvious: it is not natural for the children to damage the nicely prepared material; folding is common but tearing or crumpling does not often happen without special instructions to do so.

In the case of the paper strips: the most common example is the two-dimensional enclosure, for both kindergartners and students. On the screen you can see horizontal and vertical examples.

Enclosures in a similar vein from the students' work. How can we make an outside and an

inside out of this? Let's close it off!

Three-dimensional, complex spatial creations are less in quantity, but there are some nice examples among the students. Variegated solutions, with different techniques of paper use. It can be assumed that there is a more a basic familiarity with paper as a material.

If we provide enough time for the assignment, then they won't lose hope! The creator of the right-hand work, repeating the exercise on their own initiative, learned from experience, thus making the attempt a success! (They usually stick to following the prototype (Pataky, 2011). The process characterized by perseverance and spontaneous self-development (through trial and error), with mistakes as part of the process, is most likely to lead to success.) (Bruce, 1992)

In the case of the kindergartners, the formations of planes into spatial form—that is, that there be not just walls, but at the same time spatial dividers in every orientation—clearly caused difficulties. Experimentation with folding and crumpling occurred at first in very few cases, but success on the umpteenth try was truly spectacular. The spontaneous development was noticeable! The picture on the right shows how after numerous attempts a child finally realizes how to crumple the paper strip into a roof, pursuant to her ideas.

## IV. Wooden Sticks: 16 pieces per person—tower building

In contrast to the previous exercises, the task here was to build not an alcove but a tower. A tower is also one of the basic architectural forms, that everyone unconsciously possesses conceptions "brought with us."

One-dimensional: linear construction. The simplest type. Unfortunately, this level appeared in many students' work. Vertical extension in the interests of greater height...

Two-dimensional: the appearance of unidirectional stabilization; door-like division of space.

Three-dimensional: complex creations, some kind of spatial bracing and structures to ensure stability appear in the case of a few students. For the children, it's clear that everyone is making

an effort, but not everyone succeeds. Age counts for a lot. Not one of the four-year-olds succeeded; spatial solutions proved much easier for six-year-olds.

Particular features: anchoring in the interests of stability made an appearance; while among the students, unfortunately, there was a spread of massive use of glue as a substitute for the structure's independent ability to stand.

Notable in terms of structural knowledge: Interpretable among the children as a kind of experiment. Left side: elements held together in the middle, attempts at a flexible stabilization in a star pattern on the part of the students. Right side: here we see the complete lack of structural knowledge. Thorough coiling of tape as the only idea for a solution.

Architecture Students' Enhanced Structural Experience.

After the first semester of university studies, the first-year architecture students can already easily realize spectacular structural solutions. But this is specialized training!

**Drawing and Maquette: Planning and Construction**

Before every exercise, we asked that the constructions also be put into drawing form. These pictures go in two fundamentally opposing directions: the children present their internal images and their expression in their drawings, while the students practically without exception represent or depict the observed reality. The tent requires the use of soft material. A children's fairy tale widespread in Hungary and known by all primarily represented the implementation of the instructions. This story features a bear, the shelter is built for him. Surprisingly, the students one after the other also drew the bear, while the children didn't.

**Alcoves built in trees and elevated, on stilts houses**

The construction continuing even under the ground, in a manifestation of transparency often apparent in children's drawings, points to the differences in the operation of imagination.

The tree hollow, for the children in a gigantic tree, continues below the ground.

### Assignment sheets, reflections, background variables

The assignment sheets served the research in a variety of ways: they enriched the collection of data with background variables and reflections. As we already saw examples of, everyone also made a drawing of their finished constructions. These examples again show how differently the children and the young adults approach their creations through drawing: the children complete an illuminated picture with their imagination. They build with blocks, but they draw the internal picture in their head, essentially capturing the separation of planning and construction.

It's different for the students: the scale and the structure are primary – "a block is a block." They draw the blocks as they built them, one after the other.

After showing the examples selected from the course of the research, we continue our work with one question: what do we lose by means of our educational system??? We hope that at the following conference we can offer a response based on more concrete results, along with recommendations for new paths and methods.

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