

CONFERENCE
PROCEEDINGS

**3RD INTERNATIONAL
ACADEMIC CONFERENCE ON
PLACES AND TECHNOLOGIES**

EDITORS
EVA VANIŠTA LAZAREVIĆ
MILENA VUKMIROVIĆ
ALEKSANDRA KRSTIĆ-FURUNDŽIĆ
AND ALEKSANDRA ĐUKIĆ

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Eva VaništaLazarević, Milena Vukmirović, Aleksandra Krstić-Furundžić, Aleksandra Đukić

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PLACES AND TECHNOLOGIES 2016

KEEPING UP WITH TECHNOLOGIES TO CREATE COGNITIVE CITY
BY HIGHLIGHTING ITS SAFETY, SUSTAINABILITY, EFFICIENCY,
IMAGEABILITY AND LIVEABILITY

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SKETCHBOOK AS AN ARCHITECTURAL DESIGN INSTRUMENT OF THE COGNITIVE CREATION PROCESS FOR THE QUALITY OF PLACE

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ABSTRACT

The paper explores possibilities for using sketchbook in architect's education as an architectural design instrument for the cognitive creation processes for the production of quality of place. We strongly believe that for the architect's education and future professional work, unconscious mental cognitive processes could be best captured by freehand drawing and sketching, beside conscious cognitive mental activities of perception, thinking, understanding, judgment and reasoning. This paper presents possibilities and results of new designed and tested teaching concepts and methods for the architectural design based on the course *Sketchbook – Drawn Thoughts* which form the part of the curriculum at the Master level of studies at the University of Belgrade Faculty of Architecture. As famous architects refer to sketches as *the beginnings* for the development and formulation of conceptions of architectural design, freehand drawings represent materialization of visual mental images and visions based both on rational thinking and on the impressions influenced by other human senses such as hearing, relaxing and sensing. Five mentors tested their respective different methods on students using sketchbook as an architectural design instrument, each one revealing different, yet interesting outcomes that led to conclusions of variety of outputs which might be useful for the cognitive creation processes within the architect's education processes. We will show these methods and their application on student's work and the results originated from such an approach. At the end of the paper, based on our research, we will set conclusions and recommendations both for the architect's education processes and practice of creation of place as the profession's ultimate goal.

Keywords: sketchbook, architectural design, instrument, cognitive creation process, quality of place

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INTRODUCTION

Looking at the architecture and addressing it we become aware of the importance of drawing in the design process. Diagrams, drawings and sketches are indispensable principles of architectural expression, but their impact may be linked to creating of unique handwriting of the author and recognition of his future works.

Considering the architect as creator of forms in space, Stern (1977, cited by Vrachliotis, 2005) characterized the relation of the object on the paper and the object in reality as very complex. Besides the obvious similarities of drawings and completed project, the process of drawing follows all phases of design process: from thinking, conceptualization, to the elaboration of project and realization of the building. Le Corbusier declares sketching as translating mental images in the design process. According to Porter (1997, cited by Vrachliotis, 2005), place in the imagination of architect, which is discontinuous and non-dimensional image, becomes aware just by drawing. Therefore, freehand drawing is the beginning of architectural design, and sketch is the first step of the realization of ideas.

On the other hand, analyzing the relationship of sketches and projects of significant architects, we can see a deeper importance of freehand drawing. In addition, as a form of architectural expression, which is reflected in the form of future buildings and spaces, it conveys the sensibility and character of the author to all of his works. Drawing is a medium of learning and gaining knowledge in the discipline of architecture, but it is also a medium of creating authors unique architectural style. Additionally, beside rational thinking while designing architectural projects and making decisions about the design issues, we strongly believe that for the architect's education and future professional work, unconscious mental cognitive processes could be best captured by freehand drawing and sketching. Interest for the importance of freehand drawing and sketching in life and work of architects enlightened us to research and present concept and methodology of, the workshop course *Sketchbook – Drawn Thoughts* aimed in exploring drawing skills of students, their way of thinking through sketching and connection and similarity between their sketches and final projects on studies.

METHODOLOGY

The aim and purpose of this paper is to explore possibilities for using sketchbook in architect's education as an architectural design instrument for the cognitive creation processes for the production of quality of place. For that purpose, we have chosen a methodology of the case study at the empirical level in the field of knowledge production at the academia. In order to do so, we have build our case on presenting possibilities and results of new designed and tested teaching concepts and methods for the architectural design based on the course *Sketchbook – Drawn Thoughts* which form the part of the curriculum at the Master level of studies at the University of Belgrade Faculty of Architecture.

First the conception of the course itself will be presented. Next is the explanation of five different methods which five mentors prepared and tested on students using sketchbook as an architectural design instrument. The description of each method is followed by the application in the form of student's sketches and drawings and the results of distinctive approaches showing characteristics of sketches and their relation to the unconscious mental cognitive processes.

Based on that kind of analysis with the evaluation of five methods and student's response in the form of sketchbook leads to the end in order to define main aspects in which we set conclusions and recommendations both for the architect's education processes and practice of creation of place as the profession's ultimate goal.

SKETCHBOOK – DRAWN THOUGHTS²

The course *Sketchbook – Drawn Thoughts* was conceived as a five-day workshop, where different mentors posed various tasks, in order to provoke drawing reactions of students. The main objectives of the workshop were winning the fear of white paper through rapid drawing reactions, documenting thoughts instantly by sketching, and thinking through freehand drawing. The main assumption of the mentors was that the five-day series of quick drawings creates unique drawing style of the author. We recognized the unique character of each author's drawings as a major potential of their future expression in architecture, but also in their projects on studies. In the remaining of this chapter, we will show five different methods which five mentors prepared and tested on students using sketchbook as an architectural design instrument.

3x3x3 – mentors Assistant Professor Igor Rajković and Teaching Assistant Ana Zorić

The inspiration for this segment of the workshop created by Igor Rajković and Ana Zorić, came from the simplicity and honesty in the character of children's drawings and their perception of space. This segment of workshop is divided into three parts, as an association in three spatial aspects. The whole work was accompanied by sound that would activate another sense of the workshop participants. Duration of 9 minutes was anticipated for each part of the workshop. The idea was that in first two segments, students were asked to refine their thinking about the topic through the sketch. Through quick and impulsive freehand drawings, thoughts are focused to the very essence. The product was a sketch for each segment of the workshop. The third part followed with the idea that for the short time it was necessary to draw a large number of sketches. Consequently, sketches had to be fast, accurate and reduced. Sketching this way, the aim was to reach the pure essence of the idea by drawing.

According to the method used for this segment of workshop, student's sketches and hand drawings shown two results. One is that when students were drawing quickly, the result was simple drawing, released of details, which shows the essence of the idea. The second one is that production of a large number of drawings in a short time had an impact on the speed of student's reaction and the drawing routine which was obvious in larger number of sketches in each next phase of drawing.

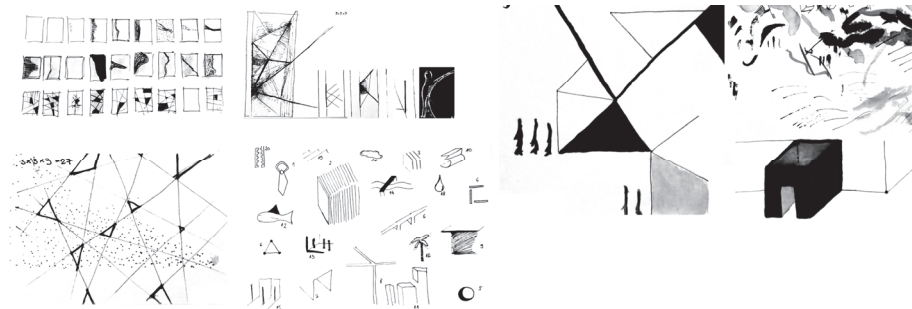


Figure 1: student's I. Nešić, B. Brankov, J. Stanković sketches from the Workshop 3x3x3, I.

Eyes wide shut – mentor Associate Professor PhD Uroš Radosavljević

The inspiration for this theme of the workshop and method used by Uroš Radosavljević is based on the idea that hand drawing follows closely the life of architects. The hand drawing is the

² Elective course workshop – *Sketchbook – Drawn Thoughts* designed by the Assistant Professor Igor Rajković at the Master level of studies at the University of Belgrade Faculty of Architecture in the school year 2014/2015.

original and distinctive medium of expression of thought through the image we create, but also the most honest indicator of personal sensibility of the author. Conceptualized in that way, hand drawing remains a unique and irreplaceable way of expressing each architect's uniqueness, sensibility and character.

The method used for this segment of workshop was divided into three tasks. The aim of the first task *Eyes wide shut* was to stimulate student's unconscious mental activities and make them fully immersed in the process of drawing in order to achieve their sincerity and creativity in drawings regardless of the result, such as children usually have. The second part was to draw *The vision of the ideal city*, which should stimulate conscious mental activities and student's imagination and visionary approach by freehand drawing, like the first visions of the Modern architects and the ways in which they represented their first visions. The third part was to draw an *Architectural diagram* of student's project on which they work at the same time on the Master Design Studio Project at the University of Belgrade Faculty of Architecture.

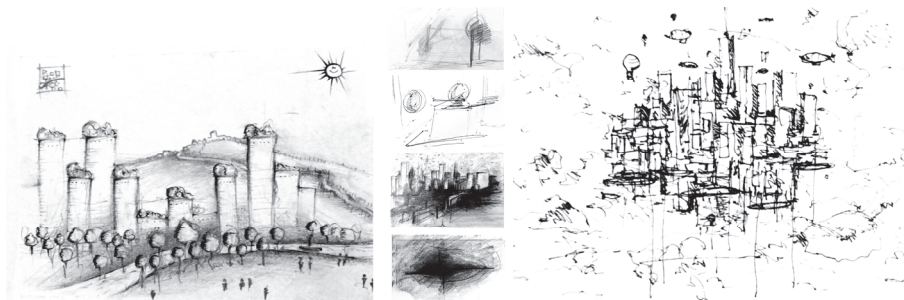


Figure 2: student's M. Blešić, M. Borović, F. Pisarić sketches from the Workshop *Eyes wide shut*

According to the method used for this segment of workshop, student's sketches and hand drawings shown two slightly different results. One is that: when students were asked to get fully immersed in the process of drawing by closing their eyes, their sketches were more natural and relaxed and it took them less time to draw, while sketches revealed their unconscious mental processes. The other result is that when students were asked to draw their Vision of the ideal city and the Architectural diagram of their ongoing project it took them more time to sketch, but again with interesting drawings which showed inner working of their mind, although sketches were more characterized by learned drawing techniques. It is interesting to notice that with sketching the Architectural diagram of their ongoing project, students were, by their own words, astonished with the new insights that sketching architectural diagram helped them further develop and formulate conceptions and hidden meanings in their design projects and reminded them of possible design alternatives which their solutions would have on the quality of built space their projects aim to accomplish.

Self marketing – mentor architect Marko Stojčić

The theme *Self-marketing*, as part of the workshop created by Marko Stojčić, emphasizes purpose of architectural drawings as a presentation of an architect and ability to convince someone of the quality of his works. In times where freehand drawing with the purpose of architectural presentations is reduced to the level of a hobby or is extremely rare, it is important to re-establish order and define the basics of presentation modes of architects and their works. To make such a thing possible, it is important to have educated young architect, which understands and know the importance of drawing as a part of the presentation, but also feels the need to express himself in such away.

According to the method used for this segment of workshop, student's sketches and hand drawings resulted in the recognition of specificity in the drawing of each author individually. Producing large number of drawings, students could recognize a similar expression of their sketches and consequently their own presentation style.

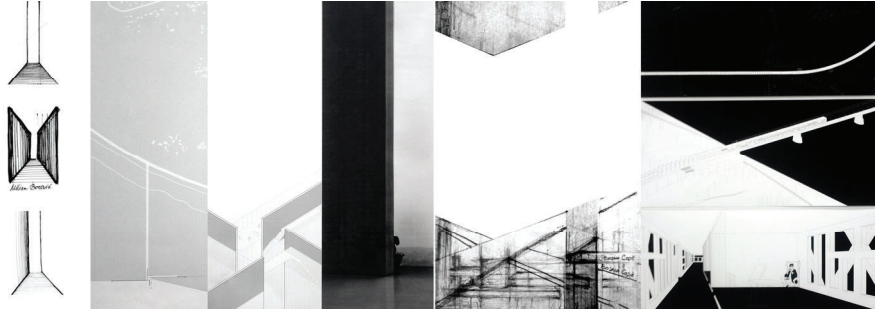


Figure 3: student's M. Borović, B. Cojić sketches from the Workshop Self marketing

From incomprehensible to recognizable – mentor architect Miloš Kašul Nikolić

The idea of this theme of the workshop and method used by Miloš Kašul Nikolić was that the participants of the workshop during two hours create eight sketches of eight unknown words from some atypical foreign language, meaning to produce one sketch based on one spoken word. Sketch should be a product on a given association of spoken unfamiliar word. Conceptualized in this way, freehand drawing remains honest way of expression revealing sensibility and associativity of the listener. Participants first drawn in silence for several minutes, and later work continued with listening to music that is not in relation to the language spoken words. The purpose of playing music was, except relaxing participants, to disrupt the sound of words and influence the character of drawings.

According to the method used for this segment of workshop, student's sketches and hand drawings shown interesting results. When students were drawing on the basis of resonance of the spoken word not knowing what it means, they translated character of the sound into a drawing. Words became images literary, but drawings themselves were diverse, which shows the differences in our experience of perception of the same things and ability of drawing to show it. On the other hand, adding effect of music in the second part of the workshop, disrupting the experience of the sound of words, drawings transformed themselves taking the character of the music.

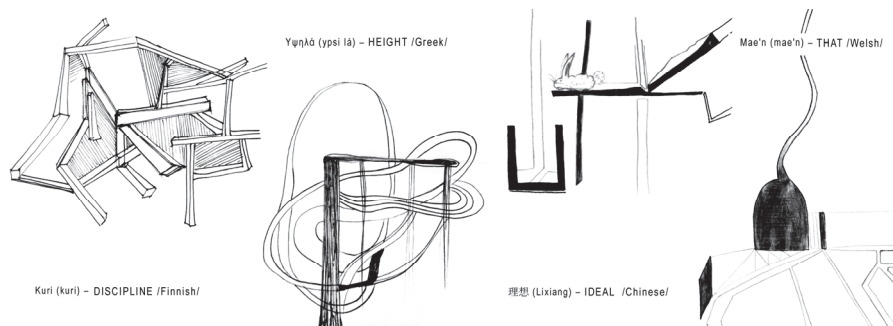


Figure 4: student's M. Borović, J. Stanković sketches of the Workshop From incomprehensible to recognizable.

Listening sketches – mentors architects Daša Spasojević & Predrag Milić

The aim of the workshop created by Daša Spasojević & Predrag Milić was to introduce students with the fear of the white paper and help them cope with that fear. Listening to the story each of us creates a certain image in his head. The aim was to discover these images and awake the possibility of artistic expression by freehand sketching. Through introducing students with freehand drawings done by architect Vladimir Milić, and talking about drawings created during the workshop, mentors wanted to emphasize the importance of communication and formulation of ideas through any architectural drawing. By drawing stories of other participants, each participant created, in fact, his own story. This way the drawing stimulates creativity and presentation skills.

The task was that each student, one by one, describes an imaginary or real object, landscape or scene. During the story, the rest of the students were drawing what they were listening to. The changes of stories were rapid, because the goal was that a sketch becomes an instinct, to win numbness and fear. Stories were different: from underground compartment, the interior of the train, ice trap, crickets over the lake, old stone houses in karst, rural landscape, wooden interior, to islands on the sea. Overall there were 19 stories, so each student had 19 drawings. Drawing process lasted about 90 minutes.

According to the method used for this segment of workshop, student's sketches and hand drawings resulted of various drawings based on the same heard story, which shows the differences in our thinking, creativity, drawing, differences among ourselves. Freehand drawing proved as a free agent of showing these differences.

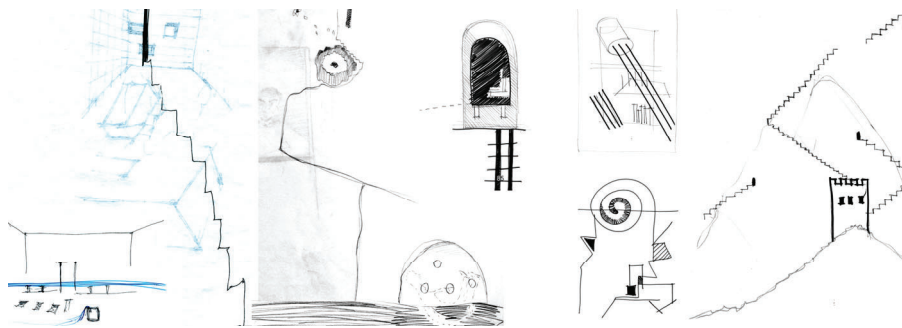


Figure 5: student's I. Nešić, J. Stanković, J. Stojanović sketches from the Workshop Listening sketches

CONCLUSIONS

By aiming to explore possibilities for using sketchbook in architect's education as an architectural design instrument for the cognitive creation processes for the production of quality of place, based on the analyzed academic course *Sketchbook – Drawn Thoughts* and its methodology, we have set conclusions and recommendations.

Analyzing the results of the workshop conceived and realized by 5 mentors, we derived conclusions about the importance of freehand drawings in the educational process for students of architecture, but also its importance in relation to other modes of expression in architectural design and set recommendations for architectural professionals:

- Freehand sketch relieve the fear from the white paper, which is the basis for freedom in creative expression;
- Freehand sketch is the most honest reaction of imagination stimulated by the influences of external factors - listening to stories, music, resonance of words...;

- Sketch as a quick reaction by hand clarifies unexplained idea of the autor, transforming it into an image and reveals unconscious mental processes;
- Sketch as a *beginning* of the conceptualization of the project shows the character of the future project in elaboration and realization;
- Drawing style creates a unique handwriting of the author, and therefore recognition of presentation and character of future projects.

Relying on previous conclusions and recommendations, drawing is important instrument in the educational process of architects, as well as their creative thinking. Freehand drawing stimulates the imagination, but the logic of drawing process affects the logic of understanding and perception of the space. Following all phases of the design process, logic of free hand drawing simulates the logic of space - first in the imagination, than in reality. Therefore, reaching design skills, drawing is an influential factor of the future quality of the space.

ACKNOWLEDGEMENTS

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REFERENCES

- Crowe, Norman and Laseau, Paul (1986). *Visual Notes for Architects and Designers*. New York: Wiley.
- Jones, Will (2011) *Architects' Sketchbooks*. London: Thames & Hudson.
- Lyndon, Donlyn and Moore, Charles (1994). *Chambers for a Memory Place*. Cambridge, MA: The MIT Press.
- Nerding, Winfried (2003). *Dinner for Architects, A Collection of Napkin Sketches*. New York: W. W. Norton & Company.
- Rajković, Igor (2014) "Sketchbook – Drawn Thoughts". Elective course at the Master level of studies at the University of Belgrade Faculty of Architecture. Accessed February 6th 2016 from the Faculty of Architecture: <http://www.arh.bg.ac.rs/>
- Vrachliotis, Georg. 2005. "Articulating Space Through Architectural Diagrams". Accessed February 3rd 2016, from American Association for Artificial Intelligence: <http://www.aaai.org/Papers/Symposia/Spring/2005/SS-05-06/SS05-06-025.pdf>
- Yanes, Magali Delgado and Dominguez, Ernest Redondo (2005) *Freehand Drawing for Architects and Interior Designers*. New York: W. W. Norton & Company