TECHNICAL TRANSACTIONS | CZASOPISMO TECHNICZNE
ARCHITECTURE | ARCHITEKTURA
4-A/2015

BEATA MAKOWSKA*

THE SIGNIFICANCE OF SKETCHES IN THE EDUCATION OF ARCHITECTS AND IN THE DEVELOPMENT OF THEIR PROFESSIONAL SKILLS

ZNACZENIE SZKICÓW W NAUCZANIU ARCHITEKTÓW I ROZWIJANIU ICH WARSZTATU

Abstract

Sketches are an irreplaceable method of recording thoughts and of correcting the design process. They are a means of discovering and examining reality which supports the development of imagination. Sketching is an essential element in the education of architects and in the double-loop learning process. Sketching opens two channels of communication: conversation and spatial-visual activity. Both traditional and new digital tools have important roles in the development of future architects. The primacy of computer design over freehand drawing in an architect's work can lead to the disappearance of a designer's individuality and creativity, limiting the role of his personality at the earliest stage of the design process.

Keywords: *sketches*, *freehand drawing*, *architect's professional skills*

Streszczenie

Szkice są niezastąpionym sposobem zapisu myśli, korygującym proces projektowania. Są drogą odkrywania i badania rzeczywistości, która sprzyja rozwojowi wyobraźni. Szkicowanie jest ważnym elementem w nauczaniu architektów, w istotnym dla ich rozwoju procesie uczenia dwupętlowego. Uruchamia ono dwa kanały komunikacji – konwersację i przestrzenno-wizualne działanie. Zarówno tradycyjne, jak i komputerowe narzędzia pełnią ważną rolę w rozwoju przyszłych architektów. Prymat projektowania komputerowego nad rysunkiem odręcznym może jednak doprowadzić do zaniku indywidualności projektanta i jego kreatywności, ograniczając rolę jego osobowości w początkowym etapie projektowania.

Słowa kluczowe: *szkice*, *rysunek odręczny*, *warsztat architekta*

* Ph.D. Arch. Beata Makowska, Division of Freehand Drawing, Painting and Sculpture, Faculty of Architecture, Cracow University of Technology.

1. Introduction

Sketches are an irreplaceable method of recording thoughts and of correcting the design process[1]. They are a means of discovering and examining reality which supports the development of imagination. They help one to remember images seen previously and to process them creatively. Thanks to drawings, perception of the world is a direct experience, something very important in the contemporary world, which we frequently come to know through a computer or TV monitor. Direct recognition enables the viewer to see things which are special, striking and important to him.

Sketching is an essential element in the education of architects and a crucial ingredient of their professional skills. Drawings are a quick and effective means of communication, playing a very important role in a fruitful dialogue between students and teachers in the process of correction[2]. Sketching is significant in the development of mental models shared between them and in the double-loop learning process[3]. According to Chris Argyris and Donald A. Schön's terminology 'double-loop learning' is a kind of learning in which discrepancies between an aim or plan of action and its results are corrected first through examination and alteration of determining variables and then by a change through action[4]. Sketching opens two channels of communication: conversation and spatial-visual activity. It enriches conversation and yields more precise answers; otherwise, forms may remain abstract and difficult to understand[5].

Drawing performs an important role in the development of students' spatial imagination, which is indispensable in the creative process[6], in which the computer is only a tool. Both traditional and new digital tools have important roles in the development of future architects. However, proliferating contemporary technologies pose new challenges in a designer's education. Recent surveys[7] point out that the limitation of training in freehand drawing, especially sketching, has negatively affected the development of students' creativity[8]. A survey, directed by *Design Intelligence* and *Almanac of Architecture and Design*), was conducted a few years ago among 800 leading American architecture firms, which were asked to evaluate new employees, graduates

---

[1] J. Silvetti, [in:] E. Robbins, *Why Architects Draw*, Mass. MIT Press, Cambridge 1994, p. 104.

[2] G. Goldschmidt, *The black-curtained studio: Eulogy to a dead pencil*, [in:] Proceedings of SCAD 2011 Symposium Spatial Cognition for Architectural Design, New York 2011, p. 9.

[3] Ch. Argyris i D.A. Schön, *Organizational Learning: A Theory of Action Perspective*, MA, Addison-Wesley Publishing Company, 1978.

[4] G. Goldschmidt, *The black-curtained studio…*, *op. cit*., p. 16.

[5] *Ibidem*, p. 8.

[6] A. Białkiewicz, *O rysunku architektonicznym* (*On Architectural Drawing*), Commission of Architecture, Urban Planning landscape Studies Polish Academy of Sciences, Lublin 2006, p. 59.

[7] I. de Vere, G. Melles, A. Kapoor, *Developing a drawing culture: New directions in engineering education*, [in:] Proceedings of the 18th International Conference on Engineering Design, ICED August 15–18, 2011, Eds. S.J. Culley, B.J. Hicks, T.C. McAloone, T.J. Howard, A. Dong, The Technical University of Denmark, Vol. 8, Copenhagen 2011, p. 151-160.

[8] G. Goldschmidt, *op. cit.*, p. 1-21.

of architectural schools[9]. According to the results, 14% of young architects were unable to draw with sufficient skill and creativity.

According to Ian de Vere, efforts must be made to reduce designers' reliance on CAD, which imposes a structured methodology, stifling creativity and restricting exploration and abstract creation[10]. The computer is a tool which we use to create images, but ideas arise in an architect's mind[11]. Similarly, use of the Internet often narrows the field of inspiration; it standardises motives and sometimes simplifies the process of thinking. The architect finds quick answers, which is not necessarily the same thing as an original search for new ideas. A human being is not always a catalyst for the integration of thoughts. A compilation of different motives available on the Internet has emerged through duplication, quotation, interpretation and *collage*[12].

2. Sketching as a way of thinking

Sketches are an important component and method of creative work – "drawing is not a transparent translation of thought into form, but rather a medium which influences thought just as thought influences drawing"[13]. They record a sequence of design moves-thoughts reflecting a continual dialectic between two ways of reasoning: 'seeing how' and 'seeing that'[14]. They enable the rapid recording of images coming into existence in imagination, which is uniquely crucial to an architect's professional skills[15].

Constant drawing deepens an architect's spatial awareness. It develops his creativity and sharpens his perception. It is a tool which expands the range of awareness. Creating images in the mind is a natural process, which is part of thinking[16]. When we draw, we

---

[9] J. Al-Qawasmi, G.V. De Velasco, *Preface*, [in:] Changing trends in architectural design education. Proceedings of CSAAR, Rabat, Morocco 2006, November 14–16, Eds. J. Al-Qawasmi, G.V. De Velasco, 2006, p. vii-ix; G. Goldsmidt, *The black-curtained studio*…, *op. cit.*, p. 18.

[10] I. de Vere, A. Kapoor, G. Melles, *Developing a drawing culture*…, *op. cit.*, p. 425.

[11] B. Makowska, *Szkice i ich rola w twórczym procesie zapisu przestrzeni architektonicznej* (*Sketches and their role in creative process of architectural space description*), [in:] *Definiowanie przestrzeni architektonicznej. Zapis przestrzeni architektonicznej* (*Defining of architectural space. Description of architectural space*), Monograph No 441, Vol. 2, Ed. Cracow University of Technology, Krakow 2013, p. 308-312.

[12] *Vitamin D2. New Perspective in Drawing*, Phaidon, London 2013, p. 11-12.

[13] I. Fraser and R. Henmi, *Envisioning Architecture: an analysis of drawing*, Van Nostrand Reinhold, New York 1994, p. viii.

[14] G. Goldschmidt, *The dialectics of sketching*, Creativity Research Journal, Vol. 1/1991, p. 123-143; E. and M.D. Gross, *Drawing as a means to design reasoning*, 1996, http://depts.washington.edu/dmachine, p. 2.

[15] A. Białkiewicz, *Rola rysunku w warsztacie architekta. Szkoła Krakowska w kontekście dokonań uczelni europejskich i polskich* (*The Role of Drawing in a Modern Architect's Workshop. Krakow School Against The Background of The Achievements of Selected European and Polish Universities*), Monograph No 315, Ed. Krakow University of Technology, Krakow 2004, p. 156-157.

[16] P. Zumthor, *Myślenie architekturą* (*Thinking Architecture*), Karakter, Krakow 2010, p. 69.

interpret and evaluate the real world and give it our own meaning, since reality touches us directly. Unfortunately, photographs and computer renderings cannot express and grasp what affects us directly. Sketches are a memory device, a personal record of analysis, notes and references[17]. Through sketching, an architect becomes a conscious observer of reality, interpreting and analysing it in an individual fashion. He learns how to choose and juxtapose different elements-images within a spatial whole, which he will be able to process and use in the future. Perceived and drawn reality becomes a personal experience, processed by the sketcher's sensitivity. It becomes an authentic and original document, which extends to his own roots as well as the roots of things.

Drawing helps to achieve a deeper understanding of reality. The sketcher creates his own library of images and references to which he refers more or less consciously. We see everything in the context of gathered knowledge – "we can see when we are thinking and we think when we are seeing"[18]. Sketches are a kind of rumination on paper. They are necessary to understand the step-by-step process[19]; they are "blinks of the eye, snapshots of the creative process"[20]. They express the interaction of our minds, eyes and hands[21]. It is no coincidence that 'I see' in English means not only 'I can see', but also 'I understand'.

Drawing enables one to look inside oneself; traces of the sketcher's presence can be felt within it. An image must penetrate a human being's interior (eye, mind and hand); it can inspire only when it is thus processed and experienced. It is based on individual experience and observation of the world and on information and impressions gathered by the author. It is a unique, independent and integral record. A sketch enables us to preserve and feel its metaphysical, ambiguous nature, which every viewer interprets in an individual way. It enables us to express the complexity and ambiguity of things. Sketching is a catalyst for our mind and simultaneously a basis for a return to previous solutions[22]. It is a continuous process of comparing and making corrections[23]. "Being abstract and incomplete, architectural sketches support the projection of thoughts and facilitate evaluation"[24].

3. Developing Imagination and Creativity by Sketching

When we are drawing a future architectural form in many perspectival presentations, we boost the designer's imagination, as well as the viewer's. The image comes into existence in the observer's mind[25]. Representations of architectural space are an essential source for

---

[17] K.S. Smith, *Architects' sketches: dialogue and design*, Elsevier/Architectural Press, Amsterdam 2008, p. 3.

[18] G.J. Dürschke, *Analogowy i cyfrowy zapis przestrzeni architektonicznej* (*Analogue and Digital Description of architectural Space*), [in:] *Defining of architectural space …*, *op. cit*., p. 61.

[19] P. Laseau, *Graphic Thinking for Architects & Designers*, John Wiley & Sons, New York, 2001, p. 2.

[20] W. Meisenheimer, *The Functional and the Poetic Drawing*, "Daidalos", No. 25, 1987, p. 37.

[21] M. Grave, *Architecture and the Lost Art of Drawing*, "The New York Times", 1.09.2012, p. 5.

[22] W. Meisenheimer, *op. cit*., p. 37.

[23] E. Gombrich, *Art and Illusion*, Princeton University Press, 1984.

[24] K.S. Smith, *Architects Sketches*, *op. cit*., p. 133.

[25] P. Laseau, *Graphic Thinking for Architects & Designers*, John Wiley & Sons, New York, 2001, p. 5.

stimulating knowledge and imagination[26]. They are stored in the memory and can serve as the 'scenography' for created forms. A collection of such pictures and drawings plays a culture-forming role and develops creativity. The frequent practice of drawing enables the development of spatial imagination, visual memory and attentive perception[27]. Drawings made outdoors, especially, are a very good way to create long-lasting records in the sketcher's memory (Ill. 1–4). They teach the ability to observe and understand a real space, not a virtual one. Living with a sketchbook enables us to capture thoughts, to compare them, to seek and choose the right ones. "Memory is a part of our conscious and subconscious mind; it is impossible to escape its presence and influence, thus, it has significant influence upon imagination and fantasy"[28]. Imagination is the synthesis of perception and memory[29].

Drawings and conceptual sketches resemble trajectories which guide us in the appropriate direction of research. They enable free figuration and development of a concept. They are intermediaries between the imagination and realisation of ideas. Sketching exercises the eye, the hand and imagination. It teaches abstract and synthetic thinking and elicits the essence and the structure of forms. It activates deeper levels of perception, which go far beyond ordinary visual observations.

Drawing is a way to explore space. It is the centre of cognitive and creative processes. Its task is to record existing forms chosen from reality and to find non-existent forms hidden in the imagination. Sketching links two different worlds: the one in which we live physically and the space of our imaginations and our minds. Drawing is an exercise of 'free' imagination. "The two processes of combining and restructuring together constitute important elements of the creative process"[30]. One process can easily be performed with mental imagery and need not be supported by sketching. The other is much more difficult; it should be supported and reinforced by sketching, but only experienced draftsmen can perform it fruitfully. New ideas are frequently a result of creating analogies, permutations or combinations of forms by sketching. Definite possibilities (data, concepts, principles, relevance to context, etc.) and heuristic methods (the ability to detect new insights and associate them, which is helpful in discovering new truths) are important in the ability to solve problems. Sketches are very important tools in this process[31]. Establishing a well-defined framework for a problem under study, thanks to sketching, can foster the creative design process[32].

---

[26] L. Maluga, *Trzy wieże*, [in:] *Defining of architectural space …*, *op. cit*., p. 119.

[27] B. Makowska, *Sketches which Develop Creative Thinking Skills and Imagination*, [in:] What Images Do – Symposium, The Royal Danish Academy of Fine Arts, Copenhagen, March 19–21, 2014, Kopenhaga 2014, p. 29.

[28] E.S. Casey, *Imagining: A Phenomenological Study*, Indiana University Press, 1976; [in:] K.S. Smith, *Architects*' *sketches*…, *op. cit*., p. 43.

[29] K.S. Smith, *op. cit*., p. 59.

[30] I M Verstijnen, J M Hennessey, C van Leeuwen, R Hamel, G Goldschmidt, *Sketching and creative discovery*, "Design Studies", Vol. 19, No. 4, October 1998, p. 541-542.

[31] G. Bianchi, D.C.C.K. Kowaltowski, V.T. de Paiva, *Methods which Stimulate Creativity and their Use in Building Design Education*, 13.11.2009, http://www.dkowaltowski.net/955.pdf.

[32] E.M.L.S. Alencar, D.S. Fleith, *Inventory of educational practices that favor creativity in higher education level*, "Psicologia: Reflexão e Crítica, Porto Alegre, Vol. 17, No. 1, 2004.

4. „Open places", sketches of understatements

It is important to leave so-called 'open places' in graphic presentation, in which everyone can add whatever they want, according to their own imaginations. Thanks to such understatements, interest in space and forms grows. Exaggerated realism and virtuosity focus attention on the image itself – the graphic presentation no longer contains any promises[33]. Leaving vague and unclear places in sketches enables them to be filled with different meanings. "The things and works of art which can touch us are multilayered. They have a great, perhaps even infinite, number of semantic planes which overlap, intersect and change, as we change our angle of perception"[34]. However, this requires extraordinary precision in building the image and drawing the lines. Every line should mean something – as in poetry, where every word must be carefully selected.

The imperfection of sketches creates a better, richer and more ambiguous graphic. Something that is understated in drawing has a spontaneous and open character; it lends itself more to interpretation and is less rigid[35]. Sketches support "ambiguity, imprecision, and incremental formalization of ideas as well as rapid exploration of alternatives"[36]. They should contain the dichotomy of slow (*festina lente*) and fast; they reveal an intelligence of quickness[37]. „The significance and uniqueness of hand drawings lies not in clarity of their message but in their inherent imperfection. They communicate with no one but their creator"[38]. Sketches reveal the truth about their creator.

5. Summary

The primacy of computer design over freehand drawing in an architect's work can lead to standardisation of the visual medium. It can also contribute to the disappearance of a designer's individuality and creativity, limiting the role of his personality at the earliest stage of the design process. 'Hybrid drawings' arising from the fusion of freehand drawings with computer design certainly play a greater role nowadays[39]. However, they won't replace the role sketches perform in the early stages of the design process. Paradoxically, the more the methods and tools of design improve, the more distant and elusive the goals become[40].

---

[33] P. Zumthor, *Myślenie architekturą* (*Thinking Architecture*), Karakter, Krakow 2010, p. 13.

[34] P. Zumthor, *op. cit*., p. 30.

[35] P. Gajewski, *Zapisy myśli o przestrzeni* (*Notation of Space Conceived*), Ed. Cracow University of Technology, Krakow 2001, p. 125.

[36] E. and M.D. Gross, *Drawing as a means to design reasoning*, 1996, http://depts.washington.edu/dmachine, p. 1.

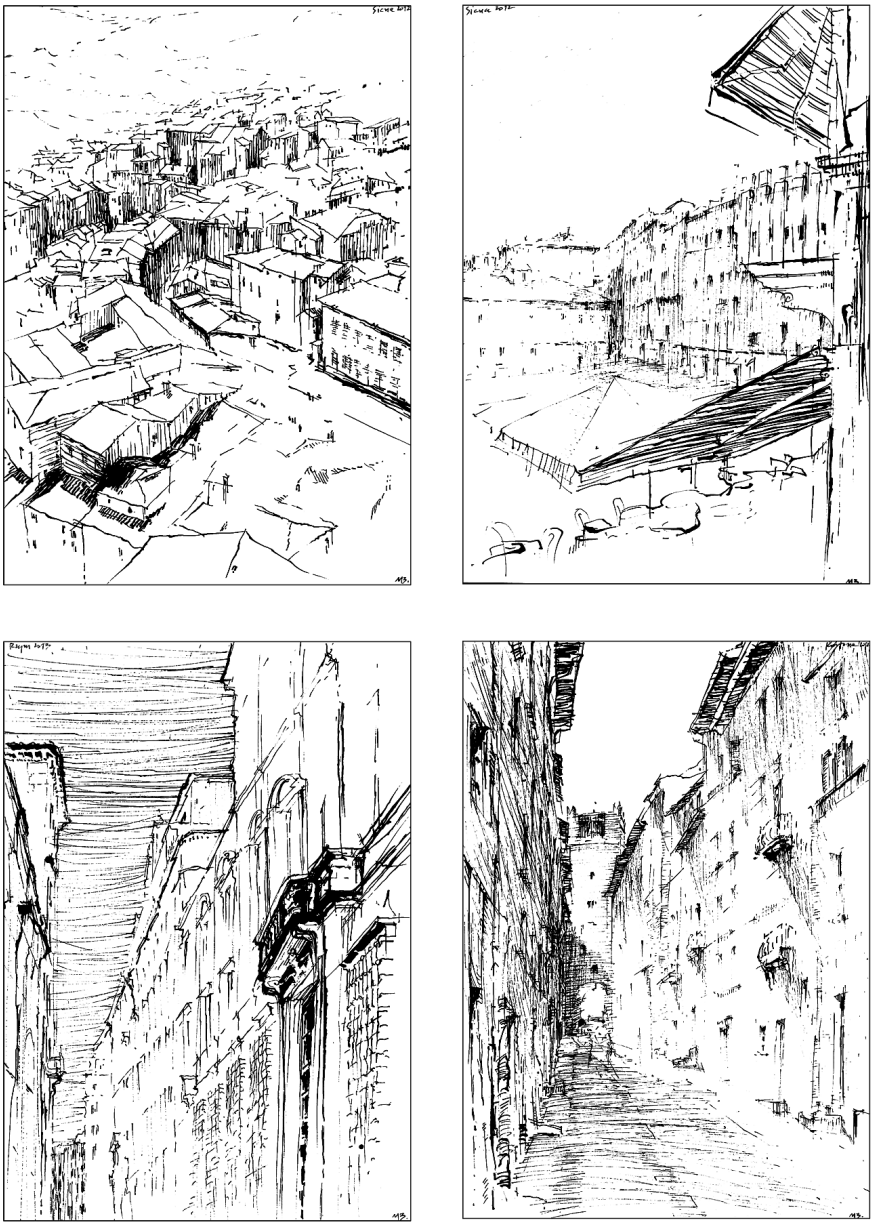
[37] K.S. Smith, *op. cit*., p. 42.

[38] Z. Hecker, *The process of design – I draw because I have to think*, [in:] *Definiowanie przestrzeni architektonicznej. Zapis przestrzeni architektonicznej*, red. M. Misiągiewicz, D. Kozłowski Monografia 441, Wyd. PK, Kraków 2013, p. 92.

[39] G. Gorski, *Hybrid Drawing Techniques. Design Process and Presentation*, Routledge Chapman & Hall, New York 2015.

[40] Z. Herbert, *Martwa natura z wędzidłem*, Zeszyty Literackie, Warszawa 2003, p. 136.

An architect's imagination has more free space when advanced technology is lacking. Independent from the computer and its hints, it has the opportunity to liberate itself from schemes and familiar methods.



Ill. 1–4. Sketches (drawings by author, 2013–2014)

References

[1] Białkiewicz A., *Rola rysunku w warsztacie architekta. Szkoła Krakowska w kontekście dokonań uczelni europejskich i polskich* (*The Role of Drawing in a Modern Architect's Workshop. Krakow School Against The Background of The Achievements of Selected European and Polish Universities*), Monograph No 315, Ed. Krakow University of Technology, Krakow 2004.

[2] Białkiewicz A., *O rysunku architektonicznym* (*On Architectural Drawing*), Commission of Architecture, Urban Planning landscape Studies Polish Academy of Sciences, Lublin 2006, 53-60.

[3] Goldschmidt G., Hochman H., Dafni I., *The design studio „crit": Teacher-student communication*, Artificial Intelligence for Engineering Design, Analysis and Manufacturing, Cambridge University Press 2010, 24 (3), 285-302.

[4] Goldschmidt G., *The black-curtained studio: Eulogy to a dead pencil*, [in:] Proceedings of SCAD 2011 Symposium Spatial Cognition for Architectural Design, New York 2011, 1-21.

[5] Smith K.S., *Architects' sketches: dialogue and design*, Elsevier/Architectural Press, Amsterdam 2008.

[6] Smith K.S., *Architects' drawings: a selection of sketches by world famous architects through history*, Elsevier/Architectural Press, Amsterdam 2005.

[7] de Vere I., Melles G., Kapoor A., *Developing a drawing culture: New directions in engineering education*, [in:] Proceedings of the 18th International Conference on Engineering Design, ICED August 15–18, 2011, Eds. S.J. Culley, B.J. Hicks, T.C. McAloone, T.J. Howard & A. Dong, The Technical University of Denmark, Vol. 8, Copenhagen 2011, 151-160.