Visual thinking in architectural education: teaching methods and feedback techniques

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ABSTRACT: In this article, the author discusses teaching methods and feedback techniques of visual thinking taught during the Freehand Drawing subject to third-year students of the Faculty of Architecture at Cracow University of Technology (FA-CUT), Kraków, Poland. The development of competencies in the effective interpretation of reality towards an abstract representation is a valuable experience expanding the imagination of architecture students. A clear and effective presentation of an idea is an essential element of the architect's work from the early design stage. Hence, experiences of this type are a valuable element in architectural education. During classes, students have the opportunity to analyse the multi-layered possibilities of visual thinking as a tool for creation. They develop their work, choose the best options and learn to defend their ideas. The article presents selected images created during the classes as examples of the student's visual thinking development. These illustrations present the results of the applied exercises and methods of feedback developing the students' ability to create their own visions.

INTRODUCTION

Freehand drawing education in architecture schools has developed and evolved over the years [1]. The study presented in this article is based on an analysis of the tasks in the Freehand Drawing subject, taught to third-year students of the Faculty of Architecture at Cracow University of Technology (FA-CUT), Kraków, Poland. The aim of the subject is development of visual skills in relation to design process. The creation of a response to the task of each design stage is achieved through a visual form of presenting design ideas. The selection of imaging methods and the number of details are closely related to the specificity of a given project and individual design decisions. The role and significance of the form of presenting the idea have been analysed in this article by capturing the visual thinking methods.

Visual thinking has played a valuable role in architecture education over the past years. Needs and requirements of the architectural profession have to follow the current noticeable tendency of replacing words with pictures. The context of contemporary visual messages is also important for designers. These illustrative messages exist in many aspects of contemporary visual culture. Graphical representations of projects should be a message conveying clear information. In this aspect, creating illustrations showing the multi-faceted nature of architecture is a challenge for designers. In addition, each time the complexity-clarity relationship connected to the illustration of an architectural idea should be taken into account.

The basic engineering record consists of architectural drawings: plans, sections, elevations, perspectives, visualisations. These images are the medium of communication in the process of creating a given work. In contemporary culture, an architect functions in the context of the omnipresence of images [2]. They act as a carrier of ideas, convey the meaning [3] and can create the illusion of participation in a given space.

In design works prepared for competitions, the designer deals with many issues, and an integral element of the concept of the competition work is the way of presenting the idea. This aspect is the keynote from which the design solutions result. In the didactic work conducted at the FA-CUT, the author broadens the knowledge related to the creation of the visual message of architecture. These issues are also at work in regard to architectural competitions, in which students participate [4]. The education process clearly shows that the priority issue is raising the students' awareness about the type of optimal presentation of ideas and the implementation of visual thinking techniques in the process of teaching future architects.

In this article is presented analysis of teaching strategies developed for improving the competencies of visual thinking. The methods of presenting an architectural idea constitute a multi-faceted problem in terms of creation and its presentation. In this aspect, the synthesis of statements and messages, the quality and originality of the illustrations

largely determine the effectiveness of the project's impact. This relationship is closely related to the ideological goal of the designer's message.

OBJECTIVES OF THE FREEHAND DRAWING SUBJECT

The aim of the subject is to develop visual skills in order to create the best possible design responses. The subject contains painting and graphic exercises. Individual drawings in different techniques are created under supervision and during tutorials. In addition, the subject is aimed at the individual development of special perception by the student, both in terms of perceiving architectural details and the overall image of the object, e.g city. The exercises are also focused on in-depth analyses of the role of composition and colour.

Specifically, the educational programme for the subject includes the following objectives:

- Using visual thinking as a tool for creation;
- Developing sensitivity to form and light based on studies from nature;
- Enhancing the ability to create painting compositions from the imagination, integrated with the architectural form;
- Expanding the knowledge of colour theory and its application in architectural practice, and acquiring the ability to perceive colour based on the study of model;
- Co-ordination of work on the architectural project.

SELECTED EXAMPLES OF THE TEACHING METHODS

1. Visual thinking as a tool on the path from realism to abstraction.

| No. 1a: Study | No. 1b: Synthesis | No. 1c: Abstract | No. 1d: Result |
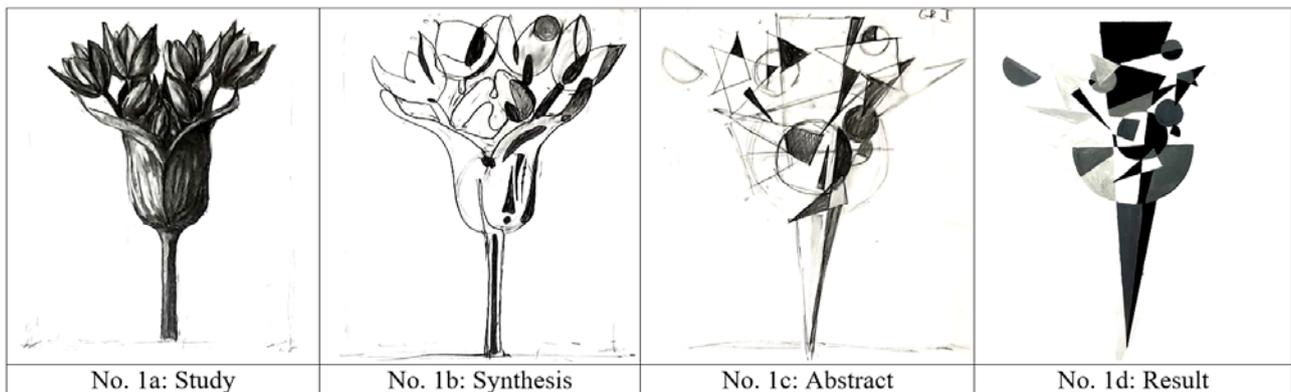
Figure 1: The subject of drawings: study/synthesis/abstraction, based on black and white photography from a photography collection of Karl Blossfeldt [5], author: Aleksandra Byczek (FA-CUT student).

a)   b)   c)
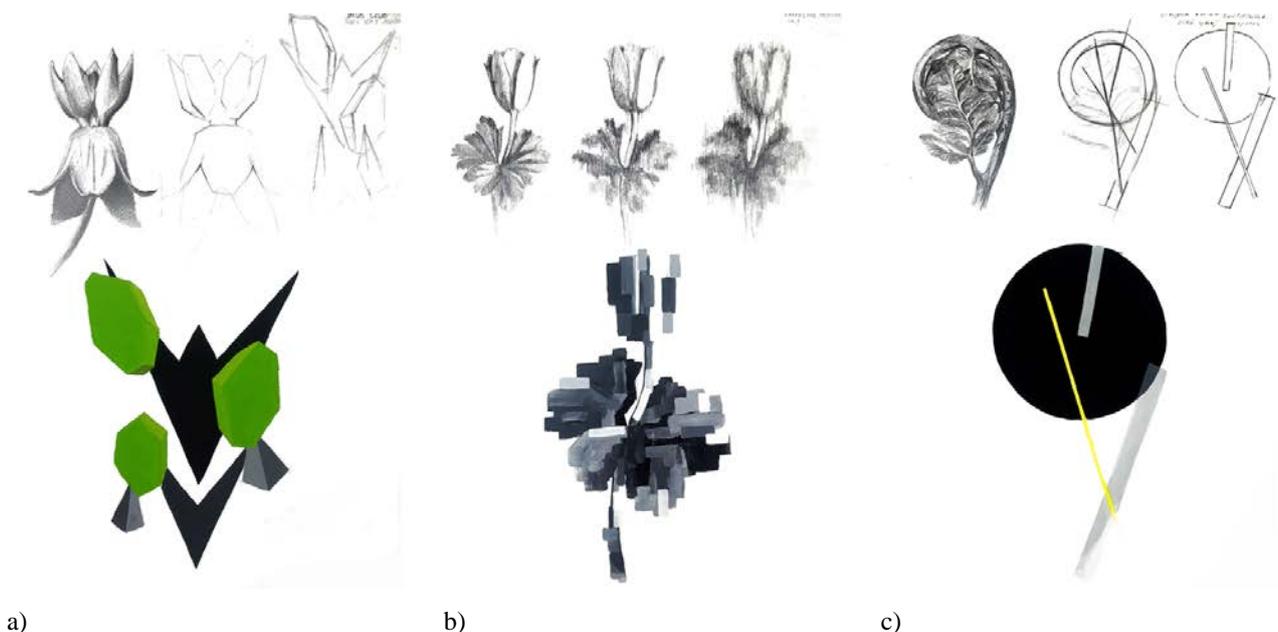
Figure 2: The subject of drawings: study/synthesis/abstraction, based on black and white photography from a photography collection of Karl Blossfeldt [5]; a) author: Jakub Czub; b) author: Katarzyna Miernik; and c) author: Weronika Kłósek-Gniewkowska (FA-CUT students).

Figure 1 and Figure 2 show representative examples of the visual thinking process related to finding answers to a given project task. This topic is based on black and white photography from a photography collection of Karl Blossfeldt [5], a German photographer renowned for his close-up works of plants. Students choose one photograph of a flower and this is the starting point for further design steps:

- Drawing no. 1a: Capture the essence of the selected plant - plant study based on black and white photography; technique: pencil, charcoal or black marker;
- Drawing no. 1b: On the basis of the previous drawing of the plant, synthetise the arrangement of lines;
- Drawing no. 1c: On the basis of both previous drawings, create an abstract and spatial drawing;
- Drawing no. 1d: As a result, create a refined abstract and spatial drawing with optional colour addition.

Solving design tasks is based on searching and analysing possible answers. In this case, the search for a design form progresses gradually from mirroring the real form to abstract interpretation. Visual thinking is reflected in the drawings of individual stages: the study of form, synthesis and abstract interpretation. The students' task is to familiarise themselves with a given form and to sublimate the key elements of the composition. Importantly, there is no one right answer, the key goal is to develop the ability to interpret and create.

Another task following the idea of transformation from realism to interpretation is carried out on the basis of the presented system of architectural solids, when students paint one picture maintaining the proportions, colour and layout of the solids, while drapery can be presented more synthetically. Still life should be painted with a bright and smooth background. Generally, the first stage is focused on the development of observation skills and the transformation of a given assumption into an image while maintaining realism. The next step is to creatively interpret this realistic painting towards an architectural landscape. The image is composed on tracing paper, B2 format. The horizon line should be in the 1/3 placement of the sheet.

Working with tracing paper is a formal help in the search for new forms. By changing the arrangement of the tracing paper, students look for a new form of expression, making design decisions based on the previous image. The formal connotations are still legible, although the resulting images are quite distant from the composition of the first realistic presentation. Critical analysis can reveal new values and aspects previously unnoticed. The expressiveness of these compositions is based on strong visual structures (Figure 3 and Figure 4).

Figure 3: System of solids presented during freehand drawing classes, FA-CUT.

a)

b)

Figure 4: a) and b) system of solids presented in a realistic painting and the interpretation towards an architectural landscape on tracing paper, author: Milena Śmiłek (FA-CUT student).

2. Visual thinking as a tool for creating variants.

Coming up with an architectural vision is a process of creation. An image can play many roles in this process. These representations are a record linked to the individual design process and idea generation. At the same time, the sketches generated during the process are a kind of visual experiment. Critical thinking and creativity are fundamental skills that help the student achieve their goals [6]. Visual thinking is a tool that supports creativity in architectural education.

a)   b)
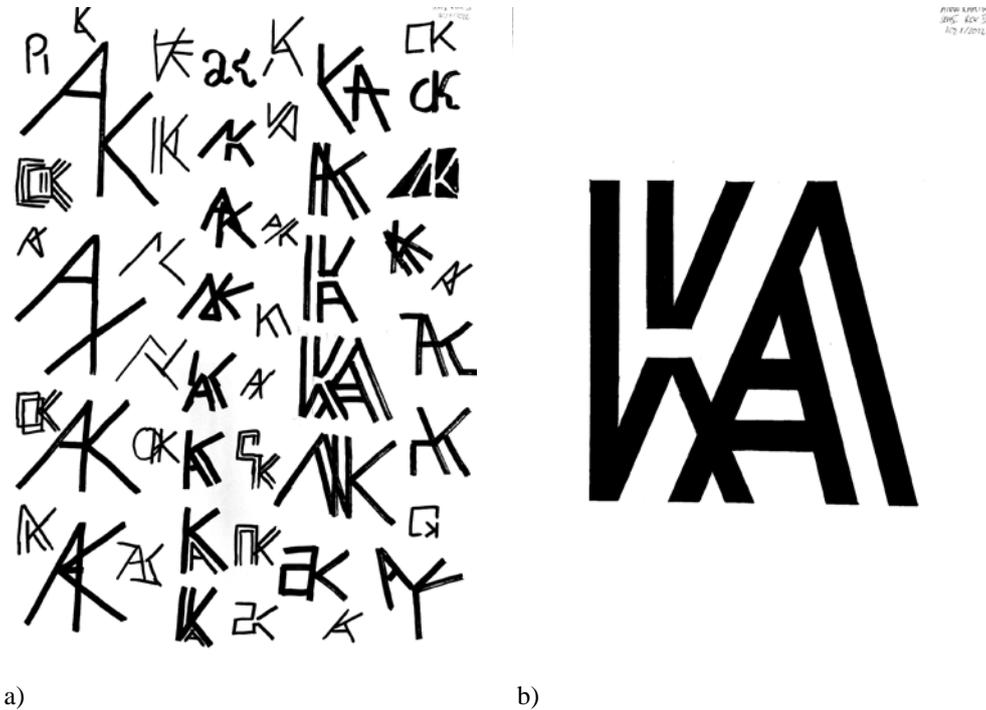
Figure 5: Ligature created by a student from the first letters of the name and surname - a task in the Freehand Drawing subject, semester 5, third year: a) sketches; and b) final design, author: Anna Kaputa (FA-CUT student).

This exercise is designed to teach a quick transposition of ideas through visual tools. It is very important that students' thoughts are directly visualised when sketching (Figure 5). Then, the final idea should be presented in a refined visual form. This allows to shorten the time of the design process and enable quick feedback from the teacher and other students.

Quick sharing of ideas in a group is a key aspect of working in architectural offices. Frequently, young designers have the task of sketching many options for solving a given design problem. Then, the lead architect with more experience determines in which direction the project is to be developed. Many times, there is no one right answer. Only through the conversation and asking the appropriate questions the student chooses the optimal direction of the project activities.

FEEDBACK RELATING TO VISUAL THINKING STRATEGIES

Illustrating is related to the specifics of the individual designed process. For this reason, the corrections to the graphic work during the classes are very individual. Teachers give compositional hints, but also, and above all, try to make the student aware of how a given image is perceived by others. This type of feedback is closely related to the communication process that takes place throughout the visual work.

In the communication scheme, one can distinguish the author of the message, a graphic work being the carrier of that message, and the recipient of the visual message. It is important to make the student aware of how the image is perceived by the recipient. What is the spectrum of possible interpretations of a given visual message? In this type of exercises, grading the detailed quantity is an important issue. Students are supposed to notice that freedom in designing is associated with a greater spectrum of possible interpretations by the recipient.

During individual corrections, the teacher does not introduce bad and good categories. Asking questions is aimed to raise awareness of how a given image will be perceived. Student confront this with their own design ideas and start a critical analysis of their own work.

During freehand drawing classes, students were asked to share their thoughts about this way of capturing their design ideas. Feedback from student and teacher discussions of the images enable future architects to develop their visual competencies. Visual thinking strategies (VTS) is a teaching method that improves critical thinking and cognitive skills through discussions of visual images [7]. The VTS is a research-based teaching method developed by the educator Phillip Yeanawine and cognitive psychologist Abigail Hausen.

Table 1: Feedback realisation scheme, relating to VTS.

Main theme	Teacher's role	Student activities	Learning outcome
1. What is going on in this image?	• Listening carefully • Pointing the observations • Asking additional questions specific to the image	• Looking carefully • Examining the picture • Analysis of own work • Describing the composition and colour	• Developing sensitivity to form and colour • Ability to describe key visual elements of the image
2. What do you see what makes you say that?	• Discussing visual forms • Commenting on the artistic quality of the image	• Linking comments with ideas • Defending ideas	• Learning to co-operate • Ability to sublime the essence of a given design
3. What more can we find out?	• Helping to achieve clarity in the multi-layered complexity of the design	• Inquisitive observation • Debating possibilities • Considering new options	• Creative visual thinking • Visual thinking as a tool to present the author's intentions

CONCLUSIONS

Architecture has a multi-layered complexity and achieving clarity in design messages is often very difficult. The designer is only able to sublime the essence of a given thought by knowing the overall decision-making structure of a given solution. This kind of asceticism is an exercise of visual clarity through messages.

The majority of students find visual thinking a valuable creation tool. For future architects it is obvious that every good idea needs to be properly illustrated. Image is a carrier of an idea capturing the author's intentions.

In tasks aimed at the development of drawing works from analysis through synthesis to abstraction, students notice the relationship between design freedom and design constraints. The first phase has the greatest number of limitations because it relates to reality. Then, in the next steps the number of restrictions is reduced and the freedom of design increases. Students move from observation to creation; it is an activity analogous to working in an architectural office. Individual feedback and conversations during drawing classes indicate that the creation is the most difficult phase, but at the same time the most interesting as a design challenge.

Visual thinking is closely related to the individual design process. For this reason, the feedback collected while working with students is also very diverse. The readability of the message and its possible forms of decoding are a multi-threaded issue. Moreover, shaping the student's visual awareness in the context of the omnipresence of the image in the contemporary world is an important aspect of education.

The evaluation of drawing works is a complex process related to the individual creation of a student. Visual thinking strategies give an opportunity to relate to a given work in a very individual way. Students develop their work, choose the best options and learn to defend their ideas.

Feedback associated with drawing exercises creates a holistic approach to the development of visual thinking. This ability is fundamentally connected with the creation and illustration of an architectural idea from the very beginning of the design phase. Appropriately selected teaching methods and feedback techniques of visual thinking stimulate creative solving of design problems. However, the author's experience shows that a lot of practice is required to realise the full potential of this multi-threaded tool.

REFERENCES

1. Białkiewicz, A., Education of architects: historical and contemporary aspects of teaching freehand drawing. *World Trans. on Engng. and Technol. Educ.*, 17, **1**, 17-22 (2019).
2. Koszewski, K., *Obrazy Architektury*. Warszawa: Oficyna Wydawnicza Politechniki Warszawskiej (2019) (in Polish).
3. Żychowska, M.J., Visual communication in imaging student projects. *World Trans. on Engng. and Technol. Educ.*, 18, **4**, 468-472 (2020).
4. Białkiewicz, A., Architectural competitions support student creativity. *World Trans. on Engng. and Technol. Educ.*, 18, **2**, 157-162 (2020).
5. Blossfeldt, K., Art Forms in the Plant World, New York: Courier Corporation (1985).
6. Gregor, P., Methods and techniques supporting creativity in architectural education. *Global J. of Engng. Educ.*, 23, **3**, 191-196 (2021).
7. Yenawine, P., *Visual Thinking Strategies: Using Art to Deepen Learning across School Discipline*. Cambridge: Harvard Education Press (2013).