

Non-Verbal Communication in Collaborative Architectural Design

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Abstract. *The paper introduces a novel approach to understanding the nature of visual communication within the design process in architectural education using open-source interfaces. It derives from the idea that visual non-verbal communication indicates the critical moments of the design process, where communication efficiency could be improved. The aim of this research is to evaluate how effective can non-verbal communication become in the early design phases. We will also discuss how this mode of communication works in collaborative design in architecture and how it relates verbal communication.*

Keywords. *Collaboration; collaborative design; architecture; visual non-verbal communication; remote communication.*

INTRODUCTION

The chronological order of the developments in collaborative design research (Achten and Beetz, 2009) shows, that design representations research diminished while the research endeavors refocused tool development research. "The influence of tools on the way we think and design has never been of this magnitude and variety." (Kocaturk et al., 2012). It can be argued that design representation research has not disappeared, but should be traced within other frameworks, such as pedagogical models, design management etc. "Speculating about the role of digital media in architectural design, the question rises: can computer technology improve the consistent development of design ideas?" (Heylighen and Segers, 2002). This question is gaining in relevancy, especially in collaborative design research which could take use of constant improvements in computer and communication technology. The starting points of our study can be found in the results of the

inquiry into verbal communication in collaborative design, focused on communication control, communication technology, social communication level and design communication (Gabriel and Maher, 2000). Our question related to the study, presented in the paper, is: how to develop a model of visual communication in relation to the already developed model of verbal communication with and without computer mediation? The development of communication models (Alaçam Aslan and Çagdas, 2008) shows a wide variety of interpretations. What happens to those interpretation in the case of experimental architectural design without words? Our research is new and valuable in this research context as it shows some key early stage design moments, when the design communication needs to be intensified consciously. The changes of the meaning, deriving from different text emphasis or oral intonation while using written or spoken words, are, in this

case, communicated purely through the visual articulation and easily misunderstood while not supported with words and their strength of articulation. It can be argued that though the visual (non-verbal) communication is the key communication mode in the design practice and design education settings, the interwinement of visual and word-based communication during the critical moments of the design decision-making is of key importance for effective design communication process. Our research goals are oriented to check the assumption stated above within a simulated design practice studio setting of architectural professional education.

EXPERIMENTAL ENVIRONMENT

The experimental setting of our critical design reflections is represented by a workshop Collaborative Architecture without Words held by Faculty of Architecture, University of Ljubljana and University of Karlsruhe, Department of Architecture, working on the tree-house design task. Face to face meetings in Ljubljana were combined with asynchronous visual communication with the colleagues from Germany. A generative design process involving students on both sides was roughly organised into three main stages: analysis and data gathering, concept and design. In set time sequences of one week their task was to pass each other developed ideas with the initial start in Ljubljana. Keeping track of their limited communication using an open-source blogging platform WordPress we were able to control time and number of inputs as also visual material and verbal breaks. The communication boundary became so strong in specific design moments, that the students crossed it. Although there was a clear gap between the two collaborating sides in sense of their effort, it could be seen that the project at least on one side evoked great motivation in the design process. And in striving to fully complete the stages of their process the groups made a continuous and consistent progress, which is hard to achieve outside a collaborative setting. The goal of this intercultural collaboration was a seeding process – a project idea and perception constantly changing within the

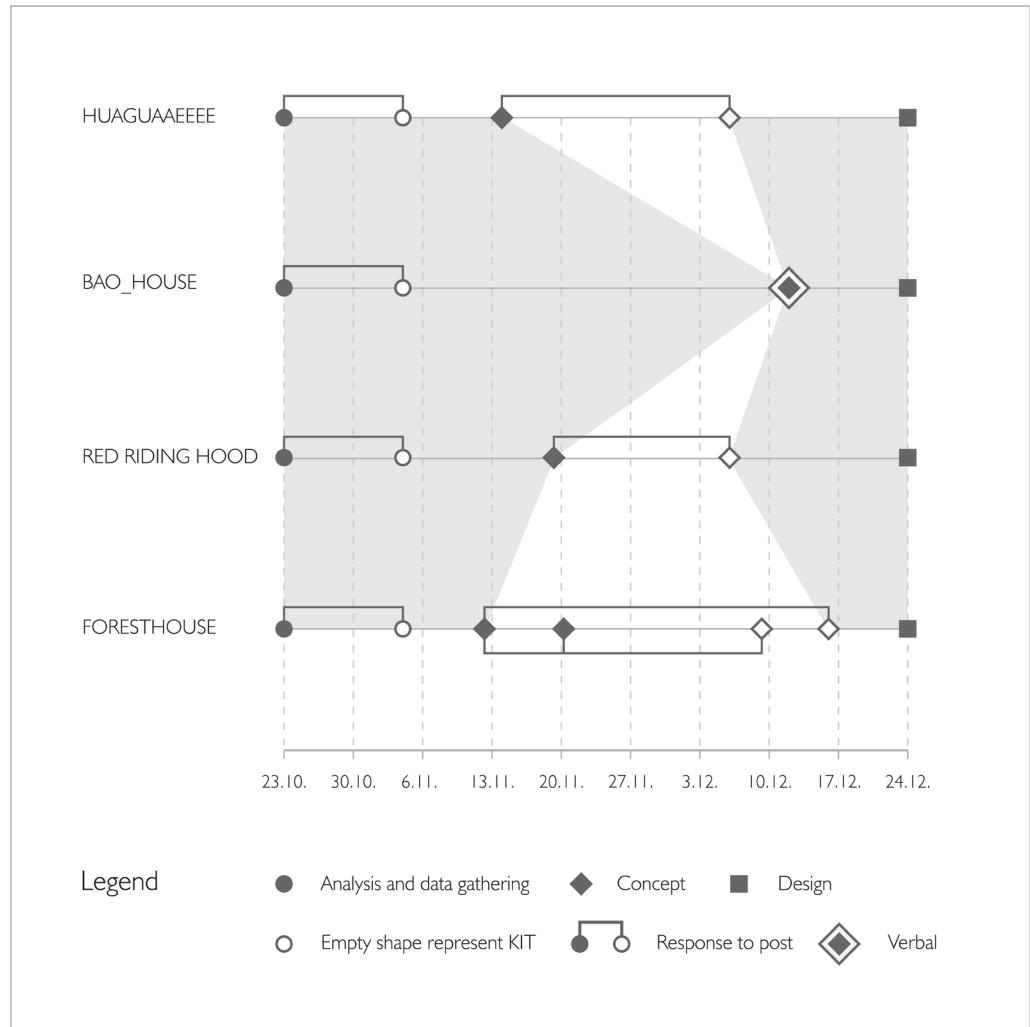
intercultural visual communication. In order to follow these temporary changes students reviewed all the previous actions, starting new ones to provoke new associations and stimulate reflections. Shifting from linear to non-linear design process students improved their individual design process, bound with others, by always returning to previous stages of design and also mixing techniques of graphical representation. Because of a strict weekly schedule they were bound to use different tools in one input: scheme, photo, sketch, model, plan and 3d model.

The Ljubljana-based intercultural group was organized in four sub-groups, developing the tree-house idea in a wide variety of options: from very abstract to very touchable solutions, representing their design ideas in a wide variety of modes: as Bao_house, Foresthouse, Huaguaaaaa and Red Riding Hood. These four sub-groups are the case-studies of our critical reflections, in their internal design communication, the communication in-between these four sub-groups, and their communication with the Karlsruhe group. How these communication modes and process differ in relation to the design stage, number of inputs, time of input, tools used and modes of input?

THE RESEARCH PROTOCOL

The question of interest was how do the stages overlap amongs the four groups and when do they occur. With fixed time sequences we defined the number of inputs and pointed out at which time sequence of each stage the communication activity increased. This could indicate a connection between engagement and effectiveness and explain the duration of the stages. Following the protocol the next phase requested to sort all the visual material of each input by the tools used. This could in connection to the duration of stages indicate points of the process when the tool used improved development and at which stages which tools are most appropriate. In addition communication was controlled by mode of input and by exposing inputs with verbal content we could map the critical points where visual communication weakened.

Figure 1
Design process of all four groups organized into main three stages.



RESULTS

Among the four researched groups two design processes were exposed: Bao_house with a weak middle stage and Foresthouse with a strong one (Figure 1). The first one following a non-continuous process, which triggered a verbal break at the transition from analysis to design in contrast to the second group

which transitioned smoothly with an emphasis on concept stage.

This was supported by the rate of using different tools at graphical representation (Figure 2) which in general points out sketch as the most appropriate tool in collaborative visual (non-verbal) communica-

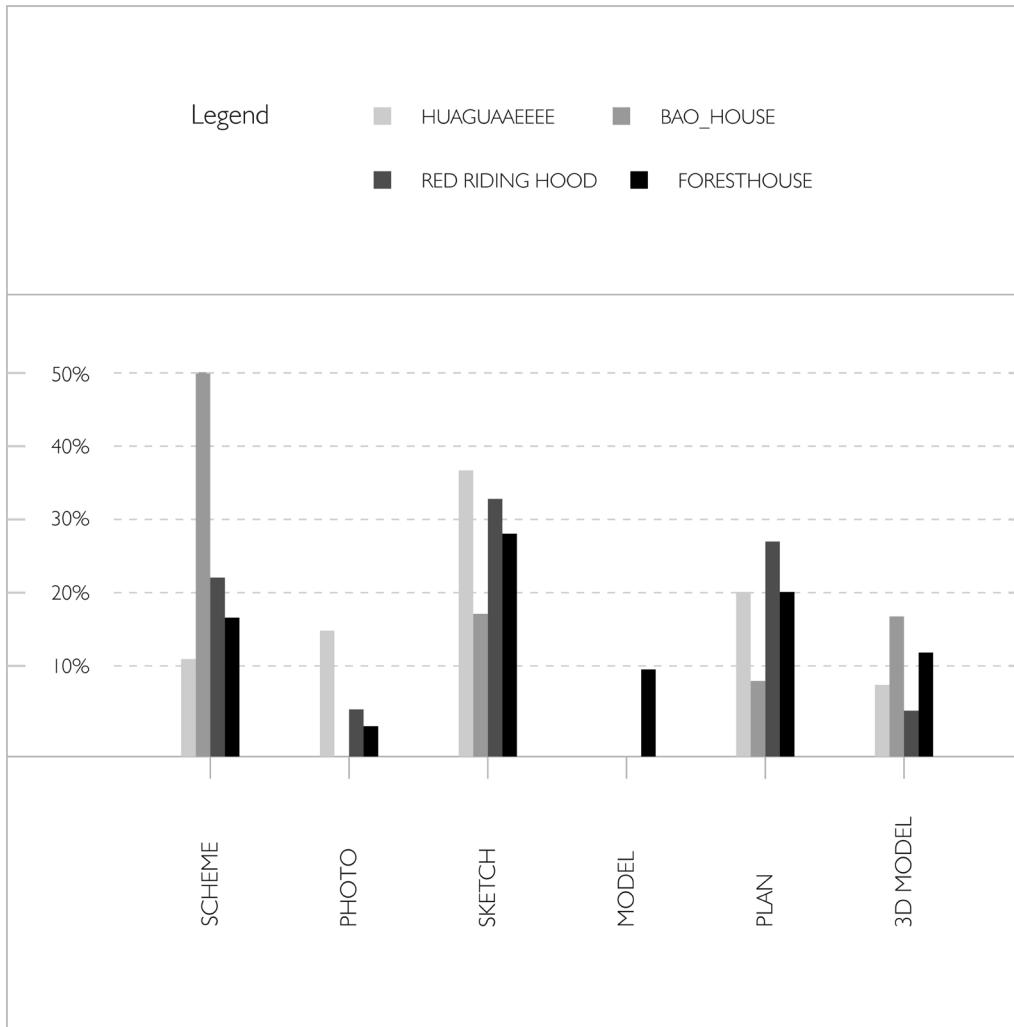


Figure 2
The percentage of used tools among all four groups.

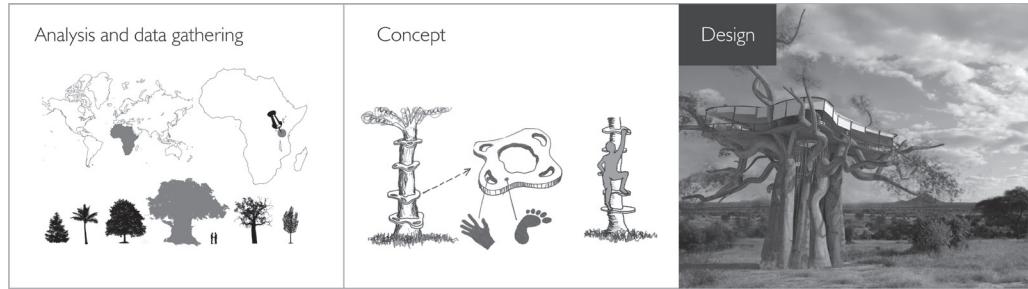
tion. Bao_house focuses on scheme and less on other tools, while Foresthouse uses all media with an emphasis on sketches. This suggests an explanation similar to verbal and spoken communication, that is sketches have more specific character and are more easily understood than other tools and are therefore more competent in replacement for gesturing and

mimicing in verbal and spoken communication (Figure 3).

CRITICAL REFLECTIONS

Though visual communication is often believed by architects to be essential and most powerful, this research is finding critical design moments where it

Figure 3
Representative images of
inputs of Bao_house groups
design process.



isn't effective enough and the need for verbal communication in relation to effectiveness increases. It is also proposing how to develop a model of visual communication that is more efficient. It suggests the sketch as the main technique used among other tools with a controlled and encouraged consistency of input without time limitations, which have in our case study weakened the continuity and engagement.

By using an open-source blogging platform WordPress [1] we were able to identify the critical moments and also assume a connection between engagement and effectiveness of nonverbal communication (Figure 4). "The online learning environment is envisaged as a dynamic and interactive logbook, where different learned elements can be compiled, organized (structured), represented and shared selectively." (Kocaturk et al., 2012).

This simple idea was in our case accomplished by not changing the digital interface and enclosing it with boundaries which would add additional costs. But therefore offered students a simple use with a continuous process from which we were able

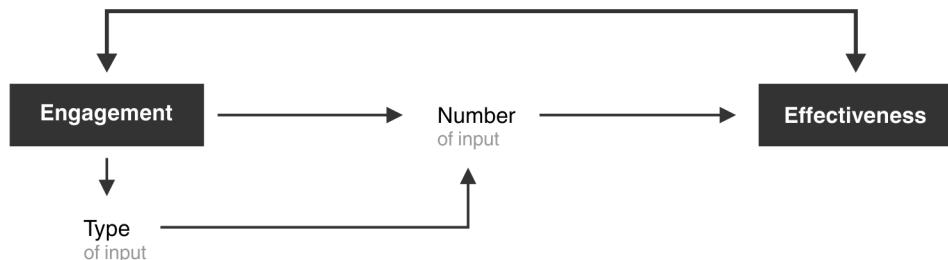
to map their use of words in regards of their type and number of architectural design idea input in a chronological representation of engagement.

For a further research on this subject and as a guideline for similar researches, the platform should be divided into different categories each representing one group respectively, users should be divided into larger groups (in our case FA and KIT), each post should contain only one image of a specific design problem with every response published as a reply to it, posts should be divided under unified tags and to assure only non-verbal posting the site needs a reviewer for each post. This would ease the research and also unify the course and the design process.

CONCLUSION

Sharing ideas with others help students to overcome their initial psychological threshold - lack of confidence and experience, as well as to strengthen their opinion, self-criticism and argument definition. Working in groups comforts their fear of judgement and encourages continuous improvement of their project. Architectural design without words contrib-

Figure 4
Engagement in connection to
Effectiveness.



utes to the feeling of design freedom from this point of view: it is more difficult to express a judgement without than with words. On the other hand it offers specific communication limitations, challenging and motivating for students. It is easier for them to identify the key critical moments of the design process where the need of intensified communication is felt clearly and explicated through their non-planned attempts to break the basic rule of using visual communication only. Reflections on those critical moments transforms their tacit knowledge about design communication processes into the explicit knowledge mode. Students are thus stimulated to improve the design efficiency and exploring new potentials of transferring also their tacit design knowledge in a networked environment.

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