Reframing Structures; Frame Experimentation in Artistic Studies

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ABSTRACT: This paper aims at the discussion of opportunities and challenges of using frame experimentation in the reflective education of artistic construction. A frame (or a conceptual framework) is a collection of stereotypes that one relies on to understand a given concept (Goffman, 1986). Frame experimentation is often used to rethink or reconnect conventions in multidisciplinary social sciences. However, the use of these conceptual reframing strategies in design based studies is less frequent. Therefore, framing of architectural systems into uncommon fields holds great potential. By using frame experimentation, older experiences can be studied in new situation, tacit unconscious knowledge can become more tactile in action.

In this context, we introduce two alternative strategies for integrating frame experimentation in artistic education and present two workshops as preliminary test cases. In these workshops, by using two specific sets of subtypes based on frame experimentation, students were able to create various conceptual studies in artistic construction.

1 INTRODUCTION

Over the last decades the traditional relationship between the architect and the engineer has starting to fade. On the one hand, more architects are introducing construction and engineering in an early phase of the design process. Instead of forcing a concept top-down into a material or construction, a bottom-up approach is favored gradually: starting with a material, technique or process, the design follows fluently and naturally. On the other hand, more engineers are beginning to think more conceptually, architecturally or artistically. Being introduced in the design process in the early phases, they are able to fit a structure system into a conceptual or primary design up front instead of forcing it upon a final model afterwards.

Because the phenomenon of “structural turn” (Leach, 2004) is quite new and not widespread, it often conflicts with the way students are educated and research is being performed at universities and academies we lecture or collaborate with. In architectural studios or workshops, the students are not primarily encouraged to give importance to the technique, construction and process that is applied. As a result, the studies proceeded in these studio exercises are mainly disciplinary (Weinand, 2009). The students are not educated to reflect on the entire architectural process, but are asked to specialize in a specific part or phase.

In the 1950’s Benjamin Bloom established a teaching taxonomy into three domains of learning: cognitive, affective and psychomotor. The taxonomy has been revisited multiple times after, but in this context we’ll focus on the classical cognitive domain only. In the cognitive domain of Bloom’s taxonomy six levels are described, i.e. knowledge, comprehension, application, analysis, synthesis and evaluation (Krathwohl, 2002).

When we apply these steps to traditional science education in general and engineering education in specific, we often start with knowledge, the lower level of the taxonomy. After knowledge we comprehend through exercises and apply the knowledge in a design in a studio or lab environment. Generally the levels of analysis, synthesis and evaluation are touched just briefly (Robert, 2008).

In artistic studies, the levels of the cognitive domain are experienced in a less sequential manner. By starting with an action (application), the student works a way through most levels of the taxonomy and hereby reaches higher levels of the cognitive domain (Robert, 2008).

The way artistic students acquire knowledge is in accordance with the contemporary learning preference of young people (born after 1980) today (Arens, 2008). With a more hand's on approach they started to learn-in-action (Schön, 1984). Starting with a problem, e.g. Nintendo game or software in general, young people acquire knowledge by doing. Through problem-solving and decision-making by a trial-and-error approach, this person work the way through all levels of Bloom's taxonomy in an active but unstructured way.

Considering the background above, framing -together with frame experimentation- have great potential in structuring knowledge and rendering events. By lecturing a conceptual framework of understanding a specific topic first, we create a scheme of interpretation for the user. By experimenting with a specific set of parts of the framework second, we create conventions and demonstrate THAT a certain combination works. By rearranging the conventions we challenge the student to understand HOW something works in an active but structured manner.

In the first part of the paper, we will review the concepts of framing and frame experimentation and stress their relevance to artistic education. Based on these concepts, we will introduce a novel conceptual framework for using frame experimentation in the reflective education of artistic construction.

In the second part, we will reveal two workshops in which the introduced frameworks are tested in two different educational settings. Afterwards, we will evaluate them in a comparative manner.

In conclusion, we will discuss the outcomes of our educational design experiments and finalize our paper with future recommendations on the use of reframing in various alternative ways.

2 FRAMING

The frame and the concept of framing is of considerable importance in artistic education today. Framing, in this context, originates from the work of Erving Goffmann (Goffman, 1974). In his work Frame Analysis, Goffmann discusses the relevance of a condition or schema of interpretation. By understanding within a "world" or "reality", selective attention organizes experiences, renders events and guides actions (Benford, 2000). In other words the frame can be used as "background", "setting" or "context".

Like a painting, a frame limits our visual field to the content within the frame, the frame describes a frame of reference in which a certain topic is understood. Unlike the painting frame, frames are active, dynamic, evolving and contentious (Benford, 2000). As a result of these properties, a frame doesn't provide a definitive set of arrangement. The frame has to be sufficient to achieve the goal in mind.

2.1 *Frame Experimentation*

Because framing has a great history in social sciences, framing methods are often colored by this background. As a result, framing tasks as described in the literature review have to be translated to be used in artistic education.

Apart from facilitating learning, a task of framing aims at providing an alternative set of arrangements to a problematic condition or situation. Benford (2000) describes three core framing tasks: diagnostic framing, prognostic framing and motivational framing. In the context of this research we focus on the second framing task: prognostic framing. In prognostic framing, a proposed solution to the problem or a plan of attack is articulated first. Next, the strategy for carrying out the plan is described and performed.

2.2 *Framework of Architectural Making*

Frame experimentation by the framework of Architectural Making is the first part of the prognostic faming strategy. The classical material science taxonomy is taken as a starting point. In material science a distinction into three groups is often made;

• Material production
• Material processing or manufacturing
• Material application or design

To stress the importance of connection details, material orientation and structure systems in Architectural Making, the list is extended to seven supertypes. The supertypes are Materials (Mt.), Products (Pd.), Processing (Ps.), Connection (Cn.), Finishing (Fn.), Orientation (Or.) and Structure System (St.) (Vrouwe, 2012).

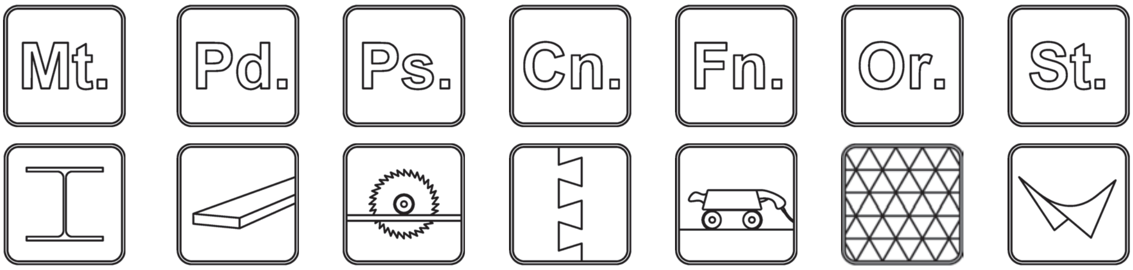

Figure 1. Supertypes (First Row) and an example of a subtype (Second Row) of the taxonomy for Architectural Making

The frame taxonomy of Architectural Making is divided into seven supertypes. Every supertype is divided into five subtypes. Each supertype is depicted by an icon with an abbreviation of its content, each subtypes has an icon of a prominent part of its content (Vrouwe, 2012).

3 TESTING FRAME EXPERIMENTATION: PRELIMINARY EDUCATIONAL EXPERIMENTS

Two preliminary applications were made for testing frame experimentation in architectural, artistic and structure-based workshops. In this section these will be introduced in the form of a case study. In both of the studies, the students were provided with a certain amount of subproblems from the frame taxonomy of Architectural Making. Every subproblem had to be incorporated within a design. Both studies involved first and second year students. The students were not given any information on structure systems besides our frame.

In the first workshop, the students were asked to design a span in paper and wood. With the change in materialization, de length of the span increased. In the second workshop, the students were given the exercise to build a structure from willow wicker.

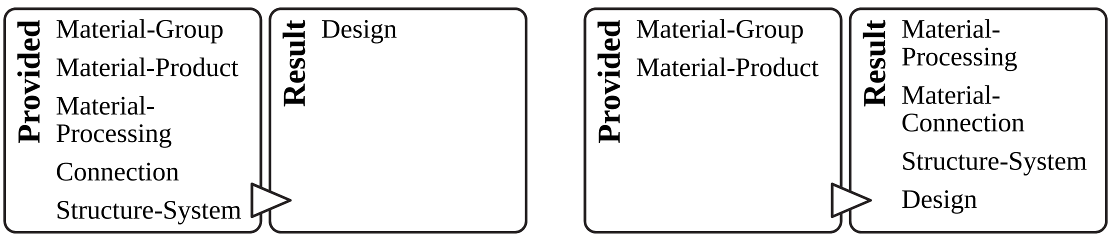

Figure 2. Workshop set-up one; WS01 (Left), Workshop set-up two; WS02 (Right)

In the workshops, two different approaches were used as the second part of the prognostic framing strategy. In the first workshop a WS01 set-up was used. The students were provided with the material-group, material-product, material-processing material-connection and the structure system. Starting with a specific set of subtypes, the students were making the design.

In the second workshop a WS02 set-up was used. The students were provided with the material-group and the material-product. The resulting designs in the workshop had to incorporate material-processing, material-connection, structure-system.

The prospect of the difference in knowledge when comparing the WS01 to the WS02 set-up is that students in the first set-up experience THAT a certain combination of subtypes works. Students in the second workshop, on the other hand, experience HOW something works. The advantage of the first set-up to the second one is the relatively short amount time needed to complete the workshop. By working on the sub-problems of the indicated subtypes, the student is able to have a result in a reasonable amount of time. Compared to the first workshop, the students in the second workshop had to find out the subproblems of the subtypes first and answer the second. While the knowledge created during this process is very rich and valuable, the amount of time to create a final design is large.

3.1 *Case Study: Workshop 1*

This study was an exercise for second year students in architecture during the course Structuur Verdiepend (Translated as Structure in Depth). The workshop group consisted of 60 students. The workshop was build up into two parts over a period of two days. The first exercise was a paper span of 500mm, the second exercise was a wooden span of 1500mm.

Figure 3. Paper Span (An icon set illustrating the combination of subtypes used, WS01 approach)

In both the first and second exercise a WS01 approach was used. The students were provided with a material (paper), a material product (flat sheet), a material processing (bending and folding), a material connection (tape), and a structure system (vector-active). This first part of the workshop was used to introduce the students with reflective artistic construction.

Figure 4. Workshop 1, Paper Span Studies

As introduced above, the goal of the first part of the workshop was to make a 500mm span that could sustain a load of 1kg hanging in the middle. When the test was successful, the span was loaded until it breaks. This way the students were able to reflect on the strong and weak spots of their design.

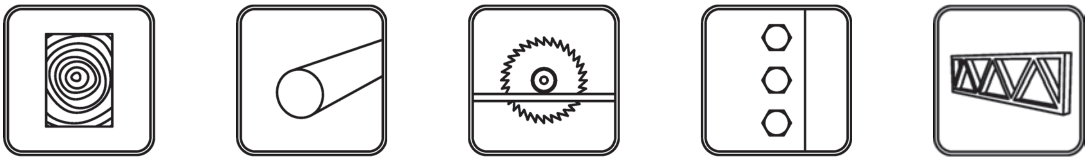

Figure 5. Wooden Span (An icon set illustrating the combination of subtypes, WS01 approach)

In the second exercise, the students were provided with a material (wood), material products (bar or strip), a material processing (cutting), a material connection (glued or mechanical fastening), and a structure system (vector-active). In the second part of the workshop, the students were able to apply their knowledge from the paper span into the design of a wooden span.

Figure 6. Workshop 1, Wooden Span Studies

The goal of the second part of the workshop was to make a 1500mm span that could sustain a load of 10kg hanging in the middle. In the design the use of material with a maximum length of 400mm was allowed. The weight to load ratio had to be calculated as a score. Like in the first part, the span was loaded until it breaks. The students were asked first to predict the behavior of the structure under loading. Afterwards the students reflected on the results.

3.2 *Case Study: Workshop 2*

This study was an international Erasmus IP workshop for architecture students late in their bachelor or in their masters. The group consisted of about 40 people from academies in Poland, Belgium, Denmark, the Netherlands, Norway, Lichtenstein and Spain. The workshop was held in Gdanks, Poland over a two week period.

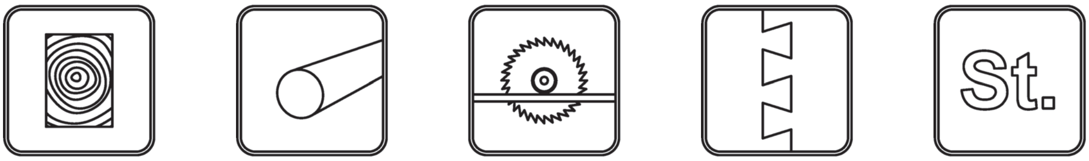

Figure 7. Wooden Span (An icon set illustrating the combination of subtypes, WS01 approach)

In the exercises a WS02 approach was used. The students were provided with the material (willow), the material product (branch, bar). Furthermore, the students were given tools for cutting and no material for connection.

Figure 8. Workshop 2, First week studies

The first week of the workshop was used to introduce the student with reflective artistic construction. In this week the students developed and evolved connection principles and implemented these in matching structure systems.

Figure 9. Workshop 2, Second week studies

In the second week, the knowledge acquired during the first week was used in an architectural intervention. Small-scale processes and connections introduced from the small scale studies, had to be evolve into large variants.

3.3 *Comparative Evaluation of Studies*

We used several methods to compare the two workshops. First of all, the student works were analyzed and ranked according to the number of subproblems incorporated into their designs.

Moreover, we have organized an in-depth survey of students' satisfaction and perception of the workshop and their previous experience on the introduced design problems (since or space is limited in this conference paper, we will share only a part of the results).

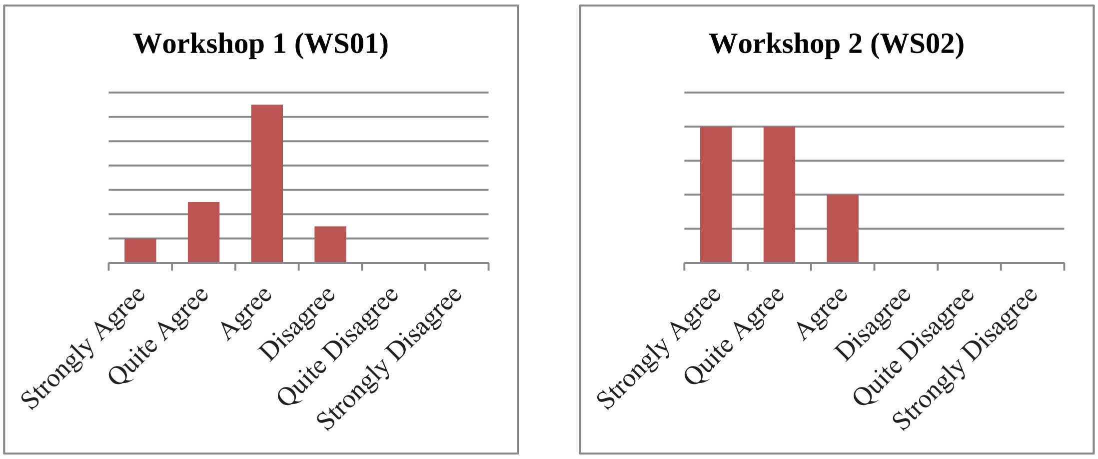

Figure 10. Comparison of the helpfulness of using limitations to understand artistic construction from workshop 1 (left) to workshop 2 (right)

In both the first and second workshop, the suggested frame was successful in directing attention of the students to the sub-problems relating to the subtypes. By dividing an abstract task into noticeable elements, most students were able to incorporate each sub-problems into their design. From the first part of the workshops to the second, small variations were noticed in the amount of attention to efficiency of construction. For some, the influence of efficiency of the design was rated higher whereas for others the aesthetics were prioritized. However, the biggest difference in the student response was in their perception of the helpfulness of framing by sub-problems to create a bigger understanding of artistic construction. Our observations suggest that this difference was closely related to the difference in the nature of knowledge used in WS01 and the WS02 set-ups. In the WS01 set-up, the students know THAT a design will be successful when the defined set of sub-problems is applied within the given context. In the WS02 set-up, the students know HOW a design can become successful by recognizing sub-problems and studying and implementing them into the design one by one.

4 CONCLUSIONS AND FUTURE PROSPECTS

In this paper, we discussed the potentials of framing and frame experimentation and introduced two alternatives for integrating these concepts in artistic education. We tested these alternatives in two different educational settings and compared the results.

In the first workshop a WS01 set-up was used. In the WS01 set-up the students are provided with a large amount of pre-set sub-problems. In the second workshop a WS02 set-up was used. In the WS02 set-up, the students are provided with a small amount of pre-set sub-problems.

When comparing the difference in knowledge between the WS01 to the WS02 set-up, the students in the first set-up experienced THAT a certain combination of subtypes works. Students in the second workshop, on the other hand, experienced HOW something works. The advantage of the first set-up to the second one was the relatively short amount time needed to complete the workshop. By working on the pre-set sub-problems of the indicated subtypes, the student were able to have a result in a reasonable amount of time. Compared to the first workshop, the students in the second workshop had to find out the sub-problems of the subtypes first and answer the second. While the knowledge created during this process is very rich and valuable, the amount of time and the intensity of coaching by the teacher to create a final design was large.

In the first workshop, we found that the students incorporated the sub-problems into their designs more structured. This has increased the group success, in line with the focus of the assignments.

In contrast, the satisfaction of the students was higher in the second workshop. The most possible reason for this observation was the introduction of fewer number of limitations, leading to a deeper connection with the design product and the process. Another reason can be that the introduction and discovery of solutions to sub-problems were more playful. The trial-and-error approach could be more in line with their learning preference.

In workshop 1, 32 percent of the students strongly and quite agreed that using limitations during the workshop helped them to develop a better understanding of artistic construction. This percentage was 80 in the second workshop. This result may refer to the students' perception of the knowledge acquired during the second workshop as a generic quality. According to their experiences, the application method of the framing approach was satisfactory for designing during the workshop and can as well be used in their future design tasks.

According to our survey results, the students of the first workshop experienced the exercise like a "fill-in task" that focused on a specific situation. This observation is based on the students rating of the usefulness of sub-problem limitation in the workshop being quite efficient to extremely efficient. Accordingly, the quality of limitations were rated less successful to artistic construction in general.

We also observed that a variety of factors can affect frame experimentation. For instance, the workshops were built in groups. Reviews on the studies were influenced by group dynamics.

Moreover, the second workshop was organized outdoors in a natural environment and the students were able to design and build larger scale structures.

Besides these aspects the student’s cultural background, former education and current academy are also thought to affect the findings.

Interestingly, we observed that students' experience with the introduced problems was not a determining factor in the student success. For instance, students who rated themselves as not well informed in structures, construction and materialization were able to succeed well in completing a good design. This finding may indicate that by limitation of sub-problems, the students can focus on a specific set of knowledge and skills and be successful in combining them into a design.

In the near future, we suggest to improve the two alternative frame experimentation setups and test them through workshops in which factors that affect frame experimentation are similar. In addition, pre and post-observations of the students’ knowledge and skills can lead to a better understanding of the possible effects the educational setups.

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