Creative Designing – Teaching the Impossible?!

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Summary

Structures as the essential element of architecture are the result of a creative design process. It is accepted, that a design process is a unique, innovative and emotional activity, expressing the personality of the designer. But in contrast today's engineering is characterized through rationality, computability, technocracy and reproducibility. But who - if not engineers - are designing structures? This paper shows that structural quality can only originate, if the border between art and technology is overcome. One possible and essential way to reach this goal is through teaching creative designing. Therefore so called basic elements of creativity which can be taught will be introduced: firstly knowledge about the history of structures, secondly to deal with the process of designing, thirdly to know the characteristics of perception and fourthly to be capable of (constructive) criticism that means to criticize and to review.

Keywords: Creativity, Basics of Creativity, Designing, Evaluation, Process, Perception

1. Status Quo: Art versus Engineering

Today's situation in architecture can be described though the following antipodes: the emotional-empirical part is connected with art and the creative working artist. In contrast the rational-analytical engineer's science seems to fulfill apparently objective requirements; creativity is not connected at all with the analytical methods in engineering (Fig. 1).

Impressions of today's Art
- purposeless artistic creation
- expression of personality
- emotional, unique activity
- result of a process of creativity
- artists are stars

Impressions of today's Engineering
- rational and computable
- monotone and simple
- reproducible
- engineering has less reputation in society
- engineers are faceless and speechless

Fig. 1: a) Today's art: Yves Klein, Monochrome blue, 1960, b) Structural Art: Alexander Calder, The Three, 1966, c) *Today's engineering: monotone bridges, everywhere, d) Rare Example of today's structural art: Ebro Bridge, Spain, 2002, Engineer: Javier Manterola Armisén.*

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2. Quo Vadis: Creative Designing

Today's situation in engineering is not satisfying, furthermore new materials, new designing tools and globalization have a large impact on engineering and thus new solutions are increasingly necessary due to technical, cultural and political developments. For finding new engineering solutions the way of working has to change. The new way needs to offer a connection between the objective scientific approach and the individual perception. Creative designing has the potential to do so. Of course, as creativity depends on human being, there is the very individual part which never can be taught, which is not accessible with rational arguments. And it is self-evident, that the so called hard facts are an essential part of the basics of creativity. But as these classical theoretical approaches are already positioned in the actual curriculum, they will not be further discussed here.

2.1 History of Engineering Structures

Historic structures mirror the abilities of the building society, the skills and knowledge of their people and the personality of the designer. At their time, they show new solutions for new questions. Consequently, studying historic structures, meaning studying their dependencies of technology, functionality and aesthetic can build the basics for a methodology of creative designing.

2.2 Process of Designing

Designing happens in the polar areas of social convention and physiological relations, of experience and action, of intuition and knowledge. It is impossible to determine the result of the nonlinear, chaotic design process. Thus, the design process is uncertain and risky, and the usual academic curriculum does not prepare engineering students with the possibilities to deal with such processes.

2.3 Theory of Perception

Perception is based on human experience and depending on knowledge, abilities and the point of view. The context of the structure should focus its social, cultural and topological environment. Essential is, that perception should not be reduced to the visual aspect; it has to meet all senses.

2.4 Ability to Criticize

Due to the fact that both, designing and perception are depending on conflicting, non-linear processes this demands for evaluation, including the ability to criticize. While practicing constructive criticism engineers review and discuss their own decisions to find a own opinion.

3. Conclusion

The purpose of this paper is to reach a heightened awareness of engineering design as an important element of engineering education and engineering practice. Therefore it has been outlined that the border between art and engineering is purely artificial and overcome. Moreover, art end engineering emanate from the same source, respectively they are connected in the Greek word techné. By accepting this interdependency of rational and emotional arguments engineers can satisfy their responsibility towards the built environment and the society by creating a technological, aesthetical, ecological and social satisfying milieu. One possible and essential way to reach this goal is through teaching creative designing. For creative designing the engineering task has to be treaded in holistic manor, thus being based on conceptual and structural design. In addition to the classical scientific approach this paper proposes four principles to support teaching creative designing.

4. References

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