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Biomimicry in Architectural Design Education

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Abstract

In all sciences, nature is used as a guiding spirit. A domain exists which makes progress through the imitation and observation of nature. This domain, which is called biomimicry, can be expressed as the imitation of the life system in nature. As in many areas, in the field of architectural design behaviour is seen to imitate nature. The aim of this study is to describe the concept of biomimicry, which has confronted us in the field of architecture in recent years, and to consider design and nature in relation to architectural design education. At Karadeniz Technical University, the Department of Architecture Architectural Design Courses are carried out for this purpose. Courses within the scope of the concept of biomimicry, include the architectural design process that examines the relationship of nature and design in a comprehensive manner. At the end of the period during which biomimicry is applied to the design proposal a study was made of the relationship between biomimicry and design.

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1. Introduction

Innovative approaches and different education methods have been seen, together with up-to-date developments, in the design education field. Broadening the point of view of a student in design education gives them the opportunity to evaluate the things around them in a way that is different from usual.

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For example, looking at nature and seeing solutions is very valuable, especially for designers. By keeping design flaws to a minimum, choosing the most appropriate material for design, providing recycling and solutions according to the circumstances, nature is an immense factory which is durable and aesthetic. Design should be done with this in mind and this value should be made universal. Finding solutions to design by seeking inspiration from nature is one of the approaches that should be supported in design education.

Historically, the designer observed how life continued in the residential environment and tried to accommodate the design to this environment. Nature offered them all kinds of opportunities in this sense. A great number of mechanisms and designs that evoke admiration have the potential to enrich many fields of life. As a result of the increase of our accumulation of knowledge and the development of technological opportunities, this potential gradually reveals itself every single day. Biomimicry is a method that has been tried in the field of design in every historical period, whether consciously or not, with positive results. A great many researchers have made comprehensive studies of the subject. Even if it has a short history and is seen as something new, as a science rather than a design approach, biomimicry has a place in all design education.

The main aim of this study is to teach students one of the design methods by applying biomimicry and showing the contributions of living animals to architectural design. The goals that are devoted to this main aim are to examine biomimicry design and its relationships; teach the concept of biomimicry, especially in architectural design education; broaden the method of finding solutions by looking at nature; and to introduce a different point of view and evaluate this method's effects on design education. The study used active lesson methods directed towards this aim and goals.

2. Architectural Design Education and Design Approaches

The occupation of Architect is one of the oldest occupations of mankind, because it is related to the production of the designed environment that heralds life (Nalçakan, 2006). For this reason, architectural education has gained an importance. One of the fundamental concepts of architectural education is design. Uluoğlu (1990) states that design education can be considered as the behaviour development process in which ways of thinking and reasoning are explored (Uluoğlu, 1990). In architectural design education; the educator can offer different design process models to his students. Many design approach methods are available that are used widely. Broadbent (1978) says that four different methods have been applied when forming architectural style. These have been described as the following approaches:

- Pragmatical
- Typological
- Canonical
- Analogical (Usta, 1994).

The Analogy method that has been used in this study is an approach that determines the similarities between two things. It produces new styles with a known or recognized phenomenon or style.

2.1. Analogy Method in Education and Architecture

Analogy is one of the effective cognitive mechanisms that people use to draw conclusions and learn new concepts. It plays an important role in the development and instruction of cognitive opinions and concepts. Analogy is a strong teaching and learning tool and it is also a perfect tool for many other purposes, such as problem solving, making definitions and creating discussion environments. In Greek, analogy is the similarity in proportional relations 'according to a proportion'. As this similarity can be between two forms (for example, two triangles) in different scales, it can also be between two different quantities. In education, analogy is defined as a simulation technique. In recent years, analogies are considered to be one of the best components in the process of teaching something related to science (Brown, 1993). The definition of analogy is expressed differently by different researchers. Some of these definitions are shown below:

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