بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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MONA MAGHRABY

AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

Architecture Engineering

Integrating Biomimetic Design Approaches in Architectural Education

A Thesis submitted in partial fulfilment of the requirements of the degree of

Master of Science in Architectural Engineering

(Architecture Engineering)

by

Meral Gaber Omar

Bachelor of Science in Architectural Engineering

(Architecture Engineering)

Faculty of Engineering, Ainshams University, 2007

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Faculty Council approval ...../...../.....
University Council approval ...../...../.....

Statement

This thesis is submitted as a partial fulfilment of Master of Science in Architectural Engineering, Faculty of Engineering, Ain shams University.

The author carried out the work included in this thesis, and no part of it has been submitted for a degree or a qualification at any other scientific entity.

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Abstract

Creativity and complex problem solving have been identified as meta-competencies facing architectural design education (Nagel et al., 2016). Several idea generation methods and techniques have been adopted by architectural design educators in the curricula to meet those competencies. Many scholars have incorporated Biomimetic design in architectural education for the purpose of enhancing creativity. The most famous of those studies are the BID class at Georgia Institute of Technology held in 2011 and the ITECH approach at Stuttgart University carried out in 2018. Although several studies have explored the adoption of Biomimetic design method in architectural design education, almost none have developed a clear framework of criteria for this purpose. This research aims at establishing a framework for adopting biomimetic design in architectural design education for the purpose of enhancing creativity and ability to solve complex design problems. This is achieved by means of reviewing and analyzing the literature for the Biomimetic design method and its role in enhancing creativity, and a comparative analysis for current architectural design programs incorporating biomimetic design into their curricula. The study ended up with establishing a framework of criteria for integrating the Biomimetic design in architectural design education. The framework was finally verified and refined through an empirical case study at the department of Architecture, Ainshams University. The research concluded that Biomimetic design is interdisciplinary by nature and could be integrated in design curricula at both junior and senior levels for the purpose of enhancing creativity. It functioned as a catalyst for creating a vibrant studio environment for architectural design education and helped students in understanding the process of creative thinking and complex problem solving. It is expected that the findings of this research would stimulate additional interest in the area of biomimetic design and contribute to developing new and effective teaching methods, to enhance the pedagogy of biomimetic design in architectural education.

Keywords: Biomimicry, Bioinspired design, Biomimetic design, Architectural Design Education, Creativity.