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ARCHIVING TRADITIONAL HOUSES THROUGH DIGITAL SOCIAL MAPPING: AN INNOVATION APPROACH FOR LIVING HERITAGE CONSERVATION IN JAVA

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Abstract

Indonesia has various types of traditional houses , one of which is the most unique architectural work that is the Joglo Pencu (JP) house . It also has a meaning by reason of a symbol which defines as the development of culture and identity. The role of community in the conservation of cultural heritage buildings is very important. However, due to the pressure of urbanization, many heritage buildings transitioned into modern houses . The study area is the historic area of Kudus city, which previously had a significant influence on Islamic architecture due to its residential model. This study aims to provide a social mapping using GIS and primary survey involves community participation of living

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Author keywords

Conservation ; Digital mapping ; Living heritage ; Traditional wooden house

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Abstract

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Keyword : traditional wooden house, living heritage, conservation, digital mapping

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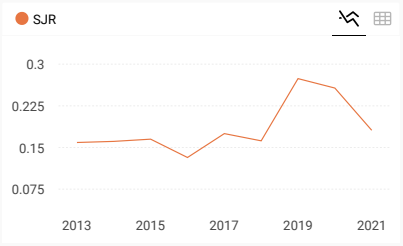

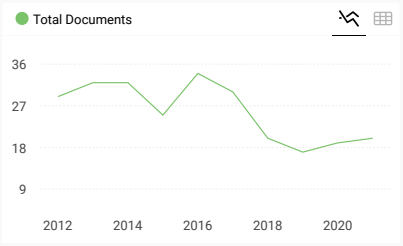

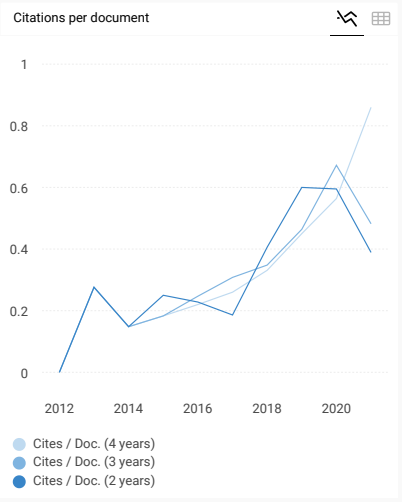

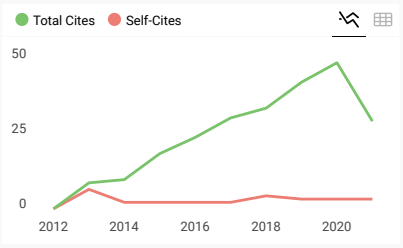

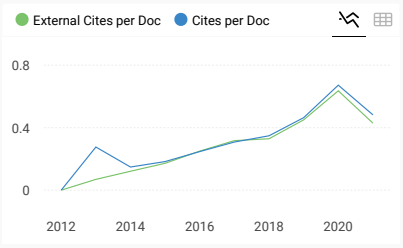

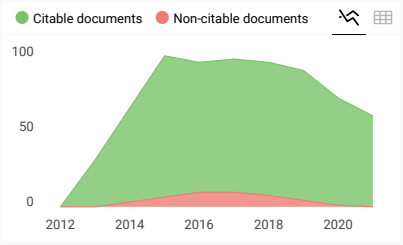

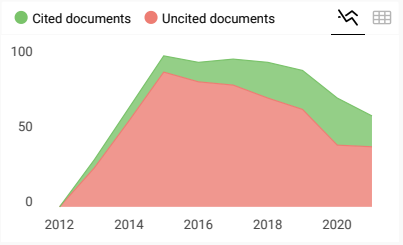

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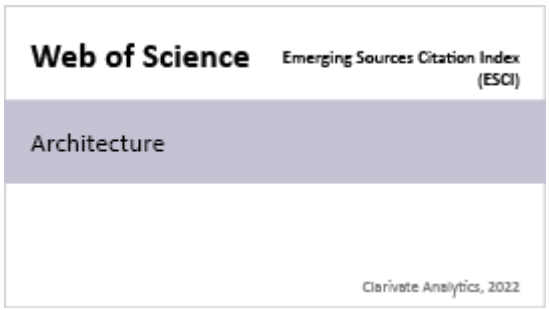

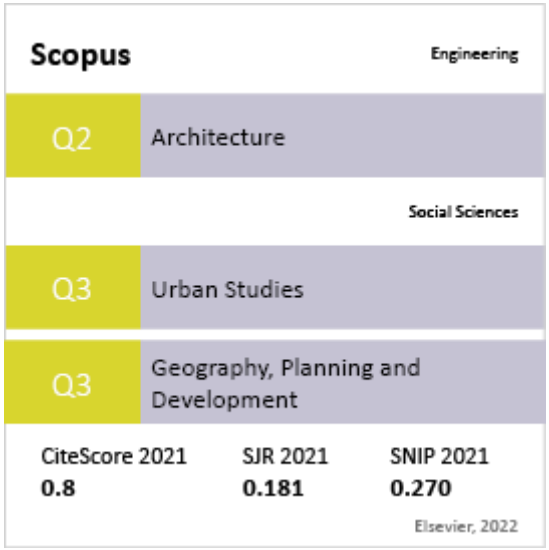

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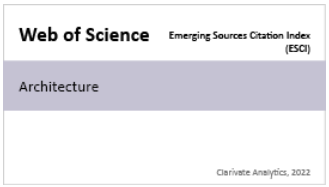

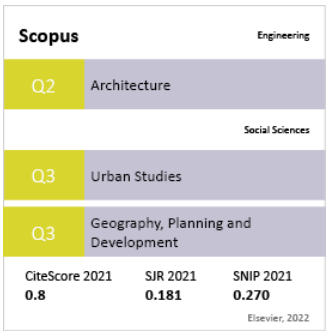

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FOSTERING INTEGRATED DESIGN IN AN ACADEMIC ENVIRONMENT: PROCESS AND A METHOD

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Abstract. In conventional building design projects architects make pre-design and conceptual design decisions on buildings and hand these down to structural and building services engineers to follow up with design development. It is well known that the conceptual design stage of a project is the point where decisions make the most impact, and changes can be made at least cost. The sustainability and innovation aspects of projects often suffer in this respect. One way of addressing this is through Integrated Design Methods that set out mobilise the full potential of all design disciplines on a project by getting them to work effectively together. This method involves architect, engineers, contractors, and owners/clients in all design phases. The current literature reported fundamental principles and processes of Integrated Design however current industry practices do not fully embrace them. Introducing integrated design studios into university pedagogies is a key step in addressing this. Reports on methods of setting up integrated design studios in a university context are however rare. The aim of this article is to develop and document the underlying settings for such design studios. The principles and best practices for applying integrated design are identified. A specific framework of settings in university context is developed and the justifications presented. This article may be of value for the industry and universities to setup integrated design studios to better foster integrated design education.

Keywords: integrated design process, building design, design studio, sustainability, best practice.

Introduction

Most buildings that perform poorly do so as a result of the subdivision of responsibility and accountability by time and by professional discipline (Rush, 1991). Most current design processes and design tools seem to be intended for individual designers with no attention for explicit teamwork embedded within them (Valkenburg, 1998). This is one of many significant cultural barriers to innovation for creating high performance buildings at the component level (where individual products are selected and combined to create the final design). Other reasons include the increasing segregation of the construction industry into more specialized consultants (Rush, 1991), lack of consultant fees/lack of value placed on the consultant's ability to innovate, poor communication, lack of competition, and different modes of thinking (convergent using logic, divergent using imagination, and lateral using both logic and imagination) between disciplines. The result is an inability to bring the engineering and architectural disciplines together to effectively co-design high performance buildings.

It is well known that the conceptual design stage of a project is the point where decisions make the most impact, and changes can be made at least cost. The sustainability aspects of projects often suffer in this respect. For example, missed opportunities for renewable energy are typically locked in at the early stages of the design before Heating Ventilation and Air Conditioning (HVAC) engineers become involved. To address this cultural barrier and facilitate incorporation of these measures into design Integrative Design Process's (IDP's) have been developed and can be applied in project delivery (7group & Reed, 2009). IDP's enable co-creation of new ideas better integrating building components (e.g. building envelop, HVAC systems, energy generation, and energy storage) into architectural design. As a part of the process concept design reports and associated communications collateral convey the benefits of the resulting integrated design concepts and the indicative performance gained forming the

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THE STRUCTURE OF A MODERN SCHOOL – CASE STUDY

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Received 27 August 2021; accepted 31 January 2022

Abstract. The aim of this article is to test and apply the developed methodology of research on the correlation between the physical learning environment and education, analysing Vilnius Geroji Viltis Progymnasium. The article analyses functional-spatial structure and usability of the selected school (applying the principles of post occupancy evaluation (POE), and analyses the school culture and the needs of school community groups, which are compared with modern Lithuanian educational goals and objectives. The functional-spatial structure of the analysed school is compared with the general school model of the 21st century formed in the author's previous research, which distinguishes 7 features of the physical learning environment that define the quality of the modern learning environment. It also examines the extent to which the current physical school environment satisfies and meets the school culture and community needs. The article provides guidelines for the implementation of the harmony of school culture (values and needs) and its physical environment, which allows each school to self-assess the physical learning environment and its cultural and 21st century school physical environment characteristics and assumptions and opportunities to meet them.

Keywords: school culture, school school culture, school architecture, general 21st century school model, school community needs, 21st century school environment characteristics, modern educational goals and objectives.

Introduction

Changing learning methods, perceptions of the relationship between the educational process and the physical environment and dependence have led to a review of current physical learning environments. The Concept of Good School (2015) states that learning outcomes and the process of achieving them are equal aspects. The concept emphasizes that the most important feature of a successful school shall be a proper implementation of the school's mission, which includes good learning outcomes and a rich, memorable, meaningful, and enjoyable life experience at school. Factors that contribute to the fulfillment of a school's mission are considered to be the learning environment, education, the school community, learning, leadership, and management. However, it is emphasized that these factors are only prerequisites for implementation of the school's mission, and the achievement of the best learning outcomes is determined by learning in different ways and organizing school activities in different ways. Thus, it can be concluded that the application of different learning methods and the organization of learning activities is not possible without development of a suitable physical environment, so the latter becomes no less important than the learning process itself and its results. However, it should be remembered that the learning environment and the physical learning environment are two different things. According to the Organisation for Economic Co-operation and Development [OECD] (2013), the educational environment consists of 4 parts: 1. teacher, 2. student, 3. learning content and 4. place (premises, equipment, methodological tools, etc.). The physical learning environment includes precisely that fourth part of the educational environment.

The mismatch of learning spaces not only with modern educational goals and objectives, but also with the needs of school building users is a pressing issue that is very common these days. According to Woolner and Cardellino (2021), school buildings reflect modern but not educational architecture, so schools are designed without regard to the local context and replicating the industrial classroom model. The creation (or redesign) of schools would be more beneficial if as many people from different professions and members of the school community as possible were involved in the whole design process (Woolner

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EFFECTS OF SUNLIGHT AND SHADOW ON THE SURFACES OF PIGEON TOWERS IN CENTRAL ASIA: CASE STUDIES IN IRAN, QATAR, EGYPT AND SAUDI ARABIA

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Received 22 April 2021; accepted 16 March 2022

Abstract. In many parts of the world, especially Central Asia, pigeon towers have been constructed as traditional buildings with different forms and types to keep pigeons. These buildings are cylindrical, cubic, dome-like and multi-cylinder in shape. This study was conducted to identify the effects of sunlight and shadow on the surfaces of pigeon towers in Iran, Qatar, Egypt, and Saudi Arabia with hot and dry or humid climates. Several pigeon towers with different types and structures in these countries were selected and modeled in detail in Rhino 5. Radiance and Ecotect were then employed to measure solar radiation and shadow on the surfaces of the pigeon towers on the hottest day of the year. According to the graphical and numerical results obtained, sunlight and shadow differently affected the surfaces of the different pigeon towers. The effect level of sunlight and shadow on the single-form pigeon towers was higher than on the vaults. In fact, solar radiation was lower and shadow was higher per square meter of the surfaces of the vaults constructed as pigeon towers in close proximity. These houses were therefore found to be the optimal type for the hot and dry or humid climate in Central Asia.

Keywords: pigeon tower, solar radiation, Radiance, Ecotect, shadow, Central Asia.

Introduction

Ongoing research on thermal energy in old buildings aims at analyzing radiation and shadow on historical buildings, especially domes of mosques, reservoirs and markets (Sedighi et al., 2017; Shiri et al., 2021). In recent decades, a growing number of articles have been devoted to solar radiation on the outer surfaces of buildings in a way that outers surfaces and forms increase thermal comfort in spaces.

Certain strategies are commonly adopted to control the effect of sunlight on the surfaces of buildings based on the shape of their outer surfaces (Mohajeri et al., 2016).

A study examined the use of renewable energy sources and determined the effects of sunlight on the surfaces of buildings from physical, geographical, technical and socioeconomic perspectives. Global solar radiation on the selected buildings was also obtained by performing a solar radiation analysis (Montavon et al., 2004; Compagnon, 2004). Today, a large body of literature is assigned to building surfaces using solar radiation measurement tools such as ArcGIS, Radiance, Ecotect, Lidar (Hachem et al., 2011; Urbanetz et al., 2011; Liu, 2014). The photovoltaic potential of Apeldoorn, (the Netherlands) was estimated at high resolution and feasible areas for photovoltaic installations and their power output were calculated (Kausika et al., 2015). Several studies also analyzed the potential of the outer surfaces of buildings for receiving sunlight (Košir et al., 2014). Moreover, numerous studies investigated the effects of sunlight on the outer curved surfaces of traditional buildings, including the domes of water reservoirs, mosques and bazaars. The effect of solar radiation on these surfaces was simulated in Radiance in dry and hot or cold climates (Shiri et al., 2019b; Shiri & Momeni, 2020; Shiri et al., 2019a). Building orientation, solar radiation, shading and natural ventilation were included in the study of thermal comfort in buildings by performing a weather data analysis in Ecotect (Haase & Amato, 2009; Petersen & Svendsen, 2010; Newell et al., 2012).

As the epitome of traditional architecture in Iran and Central Asia, pigeon towers were mainly built with curved

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Book review

PERIPHERAL MONUMENTS: BOOK REVIEW OF *THINKING DESIGN: BLUEPRINT FOR AN ARCHITECTURE OF TYPOLOGY* BY ANDREAS LECHNER

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Andreas Lechner. (2021). Thinking Design: Blueprint for an Architecture of Typology. Park Books. 460 pages, 444 b/w illustrations and plans, ISBN 978-3-03860-246-0

In *Thinking Design: Blueprint for an Architecture of Typology* Andreas Lechner reassesses the question of architectural typology in relation to design research, practice, and theory. The book is organised into three extended chapters, entitled: Tectonics, Type, and Topos. In dialogue with the text are drawings of 144 important buildings from ancient times to the twenty-first century, focused on civic typologies. Each of those typologies incorporates a suite of 12 examples drawn in neat line drawings at a consistent scale. An enclosed booklet features design theses extracts by twelve students of TU Graz that illustrate Lechner's approach to teaching and design. I reflect on each chapter and argue that *Thinking Design* offers an original theoretical reflection on the status of the urban periphery and opens compelling questions about architecture and architectural design research as a practice of critical inquiry.

Introduction

In *Thinking Design: Blueprint for an Architecture of Typology* Andreas Lechner (2021) reassesses the question of architectural typology in relation to design research, practice, and theory[1] (Figure 1). The book is organised into three extended chapters, entitled: Tectonics, Type, and Topos. In dialogue with the text are drawings of 144 important buildings from ancient times to the twenty-first century, focused on civic typologies encompassing: theater, museum, library, state, office, recreation, religion, retail, factory, education, surveillance, and hospital. Each of those typologies incorporates a suite of 12 examples drawn in neat line drawings at a consistent scale in axonometric, plan, and section. (Figures 2, 3) Occasionally a key elevation either replaces or supplements the section. An enclosed booklet features design theses extracts by twelve students of TU Graz that illustrate Lechner's approach to teaching and design (Figures 4, 5). The book is large format, which allows more careful examination of the drawings and projects. It is a beautifully produced artefact.

Lechner is an architect who combines practice, research, and teaching. He founded his design studio in Graz, in 2009, and is an associate professor at TU Graz Faculty of Architecture, where the material of the book was initially developed as a lecture series entitled "Counterintuitive Typologies." After formative study in Los Angeles, Lechner trained as an architect in Berlin, Tokyo and Vienna, obtaining a doctorate in 2009, and was a visiting researcher at the IUAV in Venice. He is an editor of *GAM*, the annually published Graz Architecture Magazine, which in recent years has tackled compelling themes including architecture and the commons, the housing question, territory, density, and landscape urbanism.

Lechner's work is compelling and stimulating. He draws on the analytical and typological processes associated with Aldo Rossi's (1966/1982) reading of cities as a composition of monuments, "permanent traces," and collective memory; but Lechner applies those approaches to interpret city edges, commercial vernacular, and the urban periphery. There is an identifiable allegiance to Rossi mixed with Venturi and Scott Brown (1972/1991), and John Hejduk (1985) as reference points. What seems significant and admirable in Lechner's writing, projects, and teaching is that intellectual culture and creative intuitive approaches are kept in close proximity to the critical rational tradition.

[1] Page numbers in the following refer to those in Andreas Lechner's *Thinking Design*.

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