Revolutionizing the Pedagogy of Architecture to Accommodate Current Scenario of Sustainable Design

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ABSTRACT

Using the concept of the hidden curriculum as a perceptual base, one begins to recognize that Schools are not neutral sites, and thus they are an integral part of the social, political, economic, and cultural relations of society. The curriculums used in Universiti Teknologi Malaysia (UTM) and Modibbo Adama University of Technology (MAUTECH) Yola Nigeria only reflect a few sustainable courses and requires a review. A critical review of existing literature from on line data base (Elsevier, ISI web of knowledge and Google scholars) was carried out in addition, the curricular of UTM and MAUTECH was also evaluated to ascertain what element of sustainable design embedded in the in the various Architectural courses taught. The paper proposed a Revolution in the curriculum to contain more sustainable courses to enable the students of architecture to be grounded in the aspect of sustainable design and sustainability. The paper concludes by suggesting that sustainable Architectural education could be enhanced through a new Architectural pedagogical approach, where the new Architectural pedagogy incorporates the elements of sustainability that can be embedded in the curriculum of Architectural programme and it is technological driven.

INTRODUCTION

The concept of ‘sustainability’ is now a vexed term appropriated by spin-doctors and political rhetoric far from its original ethical meaning. Notwithstanding this, the notion remains the same echoing the following quotation, placing an ethical responsibility upon us individually and collectively to ensure the conservation and preservation of the Earth’s resources and qualities. Designers cannot divorce themselves from this obligation, and certainly students need to establish an ethical position to address this issue. Designers are constantly faced with ethical choices about materials, design performance, interaction and communication with the community, and their role in articulating innovation and vision [1]. The Rio de Janeiro Earth Summit, and the subsequent Agenda 21 initiatives, focuses upon advancing sustainability holistically in both policy and practice. This course exposes students to both theory and practice, and to serve as an introduction to creative and robust design and or planning principles at the local level [2].

The Rio de Janeiro Earth Summit, and the subsequent Agenda 21 initiative, focuses upon advancing sustainability holistically in both policy and practice. This course focuses upon rural communities as a vehicle to involve community and council representatives actively, to expose students to both theory and practice, and to serve as an introduction to creative and robust design and or planning principles at the local level. Teaching for quality student learning at university is a challenge that never ceases. For teachers and researchers who strive to understand how to achieve successful student learning outcomes, the challenge becomes greater when new and unknown aspects are introduced to the university classroom [3]. Those who have studied architecture undoubtedly have vivid memories that characterize their design studio experience. Late nights, exciting projects, extreme dedication, lasting friendships, long hours, punishing critiques, predictable events, a sense of community, and personal sacrifice all come to mind. Those aspects are not usually written into the curriculum or even the design assignments, but they are likely the most memorable and influential in the experiences, habits and pattern found within the architecture design studio make up what we have termed studio culture [4].

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Fig. 1: Proposed Framework for Integrating Experiential Learning into Architectural Pedagogy; Source adopted from [17].

Backgrounds To The Study:

A. Studio Culture:

Defining a culture is never an easy task, more so to define the culture of a design studio make out of individualistic and dynamic mind. It is through the students, that each architecture school and architecture program developed their distinct culture. In Malaysia, alike many other countries, the discipline of architecture takes great pride in the diversity of its program and teaching pedagogies, [4].

The architectural studio model has its own culture and values that are as influential in a student’s education as the actual projects they complete. In many cases, the habits and patterns exhibited in this culture are not the intentional product, but a byproduct. These by-products can be very positive, but they can also produce harmful results. Many scholars, like Dutton have called the consequences of this culture the “hidden curriculum” of studio learning. In simple terms, the hidden curriculum refers to those unstated values, attitudes, and norms that stem from the social relations of the school and classroom as well as the content of the course [5].

In comparison to the formal curriculum with its emphasis on knowledge (i.e., course content: what should be “covered” and its place in the curriculum), the concepts of the hidden curriculum brings into focus questions concerning the ideology of such knowledge, and the social practices which structure the experiences of students and teachers.

Using the concept of the hidden curriculum as a perceptual base, one begins to recognize that:
1. Schools are not neutral sites, and thus
2. They are an integral part of the social, political, economic, and cultural relations of society.
3. This nexus of relations plays a significant role in the selection, organization, and distribution of knowledge in schools as well as
4. The formation of school social relations and practices.

Turning attention to the architectural teaching and learning design studio as a social practice and utilizing the vantage point of the hidden curriculum, it has seen that there is much in the structure of the studio that mirrors the structure of most contemporary workplaces. In other words, characteristics that have come to be common in modern workplaces do take form in some way in the architectural design studio. Normally these include systems of hierarchy which require a strict division of labour, "rigorous obedience" and orientation to means rather than ends, and an ethic of competition to ensure work compliance and intensity [6].

B. Architecture Learning Space:

As architecture education being institutionalized, the whole process of learning became regimented with the needs to follow certain criteria or guidelines set by the institution. At the same time, architecture learning space is being categorized accordingly. Freedom and dynamic of architecture learning process became cannibalized and being replace with a regimental learning system. Such learning system will only become relevant if there is an appreciation student culture and interpretation of idea of knowledge acquisition [4].

Understanding and visualizing space is one of the most difficult skills that design students must acquire during their education. Most architecture students begin their education with very limited personal experience in observing and understanding the spaces and forms that they are familiar with on an everyday basis. Architecture forms a backdrop against which their activities take place, but they are not consciously aware of the influence that the design of those spaces has on their perception [4].

Students must learn to experience the world as an observer and participants, aware of light, form, proportion, scale, color and texture as well as the perceptual feeling that they create. On a broader scale they must learn to see and experience spaces and forms in a way that will enable them to understand not only the visual but also the environment, cultural and social aspects of the natural and built environment around them.
Architecture in its purest form is neutral. Within that neutrality there is emptiness, it is through the emptiness that diversity is allow to flourish [4].

C. Architecture as Pedagogy:
Academically, architecture is in fact itself pedagogy and each building have their own embedded hidden curriculum that can greatly influence and affect learning process. However, the problem is teaching has been wrongly assumed to take place in buildings and neglected the other experience in which architecture learning can be experienced. The built environment and the landscape can be a powerful tool of learning, in this regard the campus as a whole should be regarded as a place where learning occurs. There has been—and still is—a continuous debate among architects and architectural educators about the role of knowledge and research in architecture as a discipline and profession [7, 8]. Whether in developed or developing countries, many in architecture still think of researchers as people in white smocks and thick glasses searching for the mystery and the unknown. In response, scholars and educators have emphasized that research should be viewed as part of everyday actions and experiences.

In traditional teaching practices, architecture students are typically encouraged to conduct site visits and walkthrough the built environment in order to observe different phenomena. Unfortunately however, research indicates that these visits and exercises are simply casual and are not structured in any form of investigation or inquiry. As a result, students do not realize what to see and what to look for in the built environment. The case would be worse when educators attempt to offer students ready-made interpretations about the physical world in lectures and seminar classes, leading to students’ inability to think critically or develop their intellectual skills. This handicaps their abilities to gather, analyze, synthesize, and process different types of information. Traditional teaching practices have contributed to the view of architecture as an art-based profession oversimplifying other critical views of it as a knowledge-based or research based educational discipline and profession [10]. In response, current discourses have heavily emphasized the value of knowledge acquisition and of the introduction of research based pedagogy.

D. Conventional Buildings:
Conventional building refers to the traditional type of constructed buildings, where the construction knowledge is passed from one generation to the other. The purpose of these buildings is to shelter the occupants from elements of weather and a time could be sustainable to some extent Conventional building implies the use of masonry for the outside walls, where 'masonry' infers the use of bricks and concrete blocks. Conventional building construction refers to the traditional method of construction where the construction knowledge is passed from one generation to another; not utilizing new technologies [18].

![Fig 2: Gua Musang Office Building Malaysia Source (Authors’ field work).](image)

E. Sustainable Buildings:
A sustainable building has less negative effect on the occupant’s and less impact on the environment. Buildings have a significant impact on energy use and the environment. Commercial and residential buildings use almost 40% of the primary energy and approximately 70% of the electricity in United States [19].
Fig 3: Exterior view of Security Commission Building Malaysia Source (Authors’ field work).

Method:
The method used in this paper is through a critical review of existing literature from on line data base (Elsevier, ISI web of knowledge and Google scholars) and a pilot survey carried out in UTM. A critical review of existing literature from on line data base (Elsevier, ISI web of knowledge and Google scholars) was carried out in addition; the curricular of UTM and MAUTECH was also evaluated to ascertain what elements of sustainable design embedded in the various Architectural courses taught.

Result:
The basis for choice of case studies was compare countries with green rating and non-green rating system and the result shows that UTM located in Malaysia which have its green rating system in place, green building index (GBI) have some courses that tend to incorporate sustainable values in the curriculum the courses teach (building simulation, seminars on sustainability, and experiment on climatology) while MAUTECH located in Nigeria don’t have courses that tend to incorporate sustainable values in the curriculum

| Table 1: List of Pedagogy used by Universiti Teknologi Malaysia Source; Hamdan & Bashir 2012 adopted from [9]. |
| Lecture method | Class discussion |
| Presentation by students | Building simulation |
| Peer critique | Experiment on climatology |
| Research | Case studies |
| Desk crit (Individual) | Presentation by instructors |
| Field trip | Seminars on sustainability |
| Class projects | Individual projects |

| Table 2: List of Pedagogy used by Modibbo Adama University of Technology Source; authors field work. |
| Lecture method | Class discussion |
| Presentation by students | Presentation by Instructors |
| Peer critique | Case studies |
| Research | Individual projects |
| Desk crit (Individual) | |
| Field trip | |
| Class projects | |

Discussion:
Several education theorists including Kolb, [11] voiced the opinion that experience should be an integral component of any teaching/learning process. Their work can be traced back to the famous dictum of Confucius around 450 BC “Tell me and I will forget. Show me and I may remember. Involve me and I will understand.” Experiential learning refers to learning in which the learner is directly in touch with the realities being studied [12]. It is contrasted with learning in which the learner only reads about, hears about, talks about, writes about these realities but never comes in contact with as part of the learning process. Mistakenly, some educators equate experiential learning only with “off campus” or “non-classroom” learning.

However, in architectural pedagogy a class in history or theory of architecture might incorporate periods of student practice on theory exercises and critical thinking problems rather than consisting entirely of lectures about theories of architecture and the work of famous architects [13, 14]. Learning through experience involves not merely observing the phenomenon being studied but also doing something with it, such as testing its dynamics to learn more about it, or applying a theory learned about it to achieve some desired results.

Evaluation as a valuable research vehicle needs to be introduced both in lecture courses and design studios, establishing a knowledge base about the built environment that has the capability of endowing students with more control over their learning, knowledge acquisition, and design actions and decisions [15].

Habraken argues that: We need to teach knowledge about everyday environment. How it is structured, what we can learn from historic and contemporary evidence, how different examples compare, how it behaves over time and responds to change of inhabitation or other circumstances… Teaching architecture without teaching how everyday environment works is like teaching medical students the art of healing without telling them how the human body functions. You would not trust a medical doctor who does not know the human body.

Knowledge of everyday environment must legitimize our profession… [16].

A. Architectural Education in the New Paradigm Shift:
Though the recent emergence of “green” practices and technology is positive, architecture’s faith in technology overcoming all obstacles with more technology has not been sufficiently questioned. Until this occurs, sustainable practices will remain surface endeavors and will not truly change architectural convention. Architects must re envision technology as a revelatory process for gaining authentic insight, in the process of
architectural design and building construction. This is paramount for what enhances both the conventional and new form of buildings to be sustainable is technology. Foremost, it is an ethical issue entailing a shift in how the Human/Nature relationship is envisioned. Only then we can environmentally responsible strategies integrating technology and ecology [20].

Conclusion:
In recognizing the architecture as pedagogy, we must first recognize that learning process occur beyond classroom through everyday experience. According to experiential learning theory, learning is a process whereby knowledge is created through the transformation of experience and knowledge results from the combination of grasping and transforming experience [21]. Real life experiences can provide students with opportunities to understand the practical realities and different variables that affect real-life situations. Typically, educators focus on offering students readymade interpretations about the built environment rather than developing their abilities to explore issues that are associated with the relationship between culture and the built environment. If they do, they place emphasis on one single culture, which is their own.

The paper concludes by suggesting that sustainable Architectural education could be enhanced through a new Architectural pedagogical approach, where the new Architectural pedagogy incorporates the elements of sustainability that can be embedded in the curriculum of Architectural programme and it is technological driven.

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