

## To Build or Not to Build: Going Live is [Not] Just Being Practical!

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### Introduction

Increasingly students and faculty alike are calling for a “hands-on” approach to architecture and building construction as an integral part of the architectural education. Schools of architecture have implemented courses to address this need, notably: the Harvard Graduate School of Design's 'Project on the City'; the design-build 'Rural Studio' run by Auburn University; and the Over-the-Rhine Design-Build Studio out of Miami University. Such activities are considered a good way to enhance problem-solving skills, dealing with client groups, working with different materials, construction techniques and methods, and preparing students for future practice. The courses run largely in parallel to the established design studio, mostly as electives or summer courses, but nevertheless, present as a ‘tectonic shift’,<sup>1</sup> moving from the traditional structure of architecture education, based largely on the studio, with associated support courses, to an approach that seeks to supplement the learning through interactive projects that expose students to a range of experiences to enhance the architectural education experience.

Regardless of the significance of these moves internationally, there has been only limited penetration of this approach in architectural education in East Africa. In the context of East Africa, the studio is regarded as being where students demonstrate their creative abilities, viewed as designing flamboyant buildings, often without any real sites or context to deal with - in effect, poor imitations of the real world. The notion of ‘practical’ gets lost within the context of architectural education as the nurturing of individuals who are ‘Master Builders’ or ‘Experts’, but not versed in the actual production of architecture, and how to respond directly the needs of clients.

A perennial plea from applicants to the architecture programme at Uganda Martyrs University (UMU) is to join a ‘practical programme’. This indicates a demand for something more, or different, from architectural education, although it does raise a question: ‘what does practical mean in the context of architecture education?’ From a practice point of view, this suggests practice-ready graduates. However, with students only exposed to limited architecture practice as part of their educational experience, this raises two questions; how do students acquire the necessary skills to enhance their educational experience, and more

significant, what is the purpose of architectural education? This is important with regard to future practice in the context of an unknown future.

The lack of engagement with practical courses makes teaching of architecture somewhat difficult, with students generally unable to seek innovative solutions as a consequence. Thus, there is a need to engage students beyond mere book knowledge as part of their architectural education. A design-build workshop, hosted by Uganda Martyrs University (UMU), was to introduce students to some practical aspects of architecture, in this case through the use of research on poured earth construction. The three main objectives of the workshop were to: expose students to the nature of materials; engage with a learn-by-doing construction approach and; to educate in collaboration with fellow students. This paper reports on an initial venture into live projects in the context of architectural education in Uganda. It looks at the opportunities and challenges associated with this educational approach in the context of numerous north-south initiatives, but only a few schemes initiated from the global south.

### Background and Building Traditions

Working with earth was regarded as an important part of understanding a material in use across the region for centuries. Earthen buildings have a long history across Africa, from the grand earthen structures of Timbuktu, through the wattle and daub huts of East Africa, and on to the homesteads of the Kwazulu-Natal in South Africa. However, reviewing curricula across East Africa, students have limited exposure to such historical precedents as part of their architectural education. This is a consequence of the historic origins of the architecture profession in much of sub-Saharan Africa, that disregard traditional precedents as not being architecture,<sup>2</sup> showcased by the following dialogue between Maxwell Fry and Jane Drew, early proponents of African tropical modernism:

Maxwell Fry: ‘A Nigerian aesthetic? On what would it be based that is as solid as the plywood techniques, the old timber traditions of Finland?’

Jane Drew: ‘If a Nigerian genius were to be born, upon what deeply-felt indigenous art might it not feed –and be better digested, perhaps, than Picasso’s reactions?’<sup>3</sup>

Sub-Saharan Africa was effectively *terra nullius*: the architectural canon in this context framed through discrediting of traditional building and craft practices, "... depicting it [Craft] as a form of local knowledge subordinate to the universal knowledge or 'science' of the professional ...".<sup>4</sup> The value of traditional architecture and associated materials reduced, creating a cultural hierarchy that privileged western architecture through:

[...] a devaluing of the past, knowledge of the past, and experience, then consequently a devaluing of old people, of old ways, and of old things, and finally (as we know from critiques of capitalism) a devaluation of the human being into a temporary source of labour.<sup>5</sup>

Within architectural education, elements of indigenous architecture, taboo, substituted with a new set of references and values, that prioritised a narrow single narrative of architecture, centred around great works of western architecture, described by Kingsley as a great men, great monuments approach,<sup>6</sup> which ignored the role of society in creating architecture.<sup>7</sup> Further, as an elitist endeavour, primarily responsible for urban building, architecture and architectural education has increasingly been criticised as being out of touch with society and architectural education overly theoretical.

### Constructing Walls

The value of earth as a construction material served as a starting point for the workshop. The goal was to engage students with the design and construction process and to introduce materials and construction techniques as integral to the production of architecture. The idea was to make use of a traditional material, but using it in a somewhat different way, as a means of enhancing student's appreciation of what is possible.

The workshop brought together 21 second and third-year architecture students from the University of Rwanda (UR) and the UMU, to construct a number of test walls. Prior to the build, a course at UMU has engaged students in background work to investigate various aspects of the material. Under the guidance of three instructors, with specialities in architecture, construction and structural engineering, the students undertook background research related to earth construction across the world, which included different design and construction techniques, seeking to understand the material in both historical and contemporary contexts. This included the aesthetic value of the material, with projects by Francis Kéré in Burkina Faso of particular interest to students. Students also explored the structural properties of the material. Tests included: wet and dry volume weight, grain size distribution, silt content and Atterberg limits (plasticity index). All students were required to look into the aesthetic properties of earth construction, to

see what was possible. A temporary earth sculpture; 'A Small Area of Land (*Kaka'ako Earth Room*)' by architect Sean Connolly at the ii gallery in Honolulu, Hawaii, as well as an installation at the 2012 Venice Biennale; 'There is nothing new under the sun', stood out, demonstrating the potential of earth as a material for design. Through this approach, students were able to engage with some of the abstract ideas espoused in class and investigate their practical application.

### Ideas into Reality

The construction of the test walls was the main component of this workshop and took place over a two-day period. After brief introductions, and presentations regarding the aims and objectives of the workshop, students undertook the following tasks for construction of the walls:

- fabrication and assembly of the formwork;
- batching of dry components (Laterite soil, Fine aggregate, and Cement). This was to streamline the mixing process, optimising the use of a 0.04cu.m. concrete mixer. Each wall comprised twelve batches; and
- placing material, consolidation of the mix using a poker vibrator and finishing of the top surface.



Fig. 1. Formwork

Ideas explored extended to thinking about reuse of materials and elements, with the foundation for the walls consisting of a pair of reinforced concrete test beams from a previous course. This eliminated the need for a deep foundation. The dimensions of the free standing walls, 450mm x 1,100mm x 1,000mm, were dictated by the formwork used, in this case, plywood shuttering with timber bracing elements, held together using 12mm threaded bars; constructability,

often ignored as part of the design studio, becoming an essential part of the exploration.



Fig. 3. The completed poured earth walls

Two walls were completed during the two days of the workshop, with an additional two completed later. The four walls stand as the physical outcome of the workshop, however, this was only one aspect of this process, with the exploration looking not only at the final product, but the process engagement as well.

#### Views

A key part of this workshop was to engage students in live or hands on projects, working as part of a team, or in groups. This is often missing in many architectural schools, perceived by students as not aiding the development of their personal interests, with the belief that architecture is generally a solo activity – the lone ranger architect, part of the myth of a good architect.



Fig. 2. Completing the first poured earth wall

The ability of students to appreciate the importance of teamwork emerged as a major success of the workshop. In this case, the opportunity for meaningful engagement between students of different institutions and across different years, proved to be a catalyst for collaboration. For students, this interaction also built awareness and an appreciation of alternative viewpoints, through shared experiences.

An inherent tendency was for students to stick rigidly to what they considered 'the norm', often struggling to interpret precedents as being more than mere images and requiring an appreciation of the discourse surrounding the projects studies. This in some way relates to a perception that creativity in architecture, derived from abstract notions of design, which students come with into architectural education.<sup>8</sup> The hands-on approach did promote student engagement, but it was evident that the lack of familiarity with possible 'alternatives' or how to seek out alternative approaches, hindered design exploration. Further, students struggled to go beyond the immediate task, of designing a wall element, and did not consider its potential as a building component, or as an installation within the landscape.



Fig. 4. The team

A significant realisation on the part of the students was a discontent between perceptions of what was possible in relation to a design project and what is buildable, given the limitations of the construction process. This was indeed a revelation for students causing many to rethink how they approached their design work: an important outcome of this hands-on approach. The overall tendency to ignore detail emerged as an issue in the process, as it impacted on the constructability of the walls. In this regard, the poured earth project proved an appropriate driver to explore this issue and a somewhat cost effective means of relating this back to concrete construction as well. This also required students to engage with materials and technologies of construction to derive appropriate solutions for the design challenges at hand.

A key challenge, however, related to implementation of health and safety measures, with many students perceiving this exercise more as a means of participation in the build, than as an all-round hands-on learning activity. Pre-university education also influences this perception, casting learning as a classroom based activity.

### Conclusion and Future Endeavours

The use of the Workshop Model in architectural education may offer a host of opportunities for schools in the global south that are grappling with making their programmes interactive, and giving students a hands-on approach that many seek in architectural education. Students also get to appreciate the importance of team and group work, which is inconsequential to the practice of architecture in East Africa. Further, student interaction ensures a better appreciation of the demands of 'real-world' design and construction.

Such projects could act as the means to dispel the fallacy that surrounds architecture, largely perceived as an elitist endeavour separated from the real world. Thus a revised or 'nonstandard' approach to architectural education (at least in the context of East Africa) is necessary to engage students beyond mere book knowledge, through which knowledge is learnt, but rarely applied.

This 'Workshop Model' of teaching, with a hands-on approach serves to expand learning opportunities for students and as a step towards engaging students in a 'practical' approach to architectural education. For East Africa, this does present an opportunity for the profession to engage directly with the needs of the wider population, through an experiential learning model, instead of the traditional transmission or artistic model of architectural education. The notion of handcrafted buildings, presenting an alternative path for architecture, as presented by Tovivich.

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