

Integrating Technology in Design studios - research led and practice based approach

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Abstract— Plymouth University offers two undergraduate programmes, BA Architecture and BA Architectural Technology and the Environment (ATE), with two sets of aspirations and different learning outcomes to satisfy the needs of different professional validating bodies. Recently, key design modules are restructured to bring these two disciplines together and allow them to retain and celebrate their own identity.

This collaborative learning process starts with a celebration of the differences – coming from the final year dissertation, where, architecture (ARC) students will be more theoretical and ATE students will be more diagnostic ‘case study’ informed. This body of knowledge is then overlaid with a live project as a scenario.

The studio project is undertaken in groups of both ARC and ATE students both working on each other’s skill sets to produce a knowledge exchange in studio, which ‘reconstructs’ practice. The collaboration allows for each discipline to understand, celebrate and exchange different knowledge sets.

This paper, through the recent students works, demonstrates the successful collaboration of the BA Architecture and Architectural Technology students, which is underpinned by the practice led teaching in the second year and research informed and technology driven learning process in the final year ATE programme.

Keywords— Education, architectural technology, Integration, Studio teaching

Introduction

Architectural technology has been defined as technology of architecture and encompasses knowledge and understanding which underpins the design of buildings and structures, as both a product and a process (CIAT, 2015). In the recently published Architectural Technology benchmark statement, greater emphasis is placed on design principles to achieve effective, robust and sustainable design solutions (QAA, 2014).

The recent CIAT QAA benchmark statement reflects these changes and the architectural technology education champion the professional requirements and changing scenarios in the construction industry (QAA, 2014). The practicing of architecture today is now more than ever a collaborative process. The demands on practicing and the nature of procurements systems adopted by the construction industry invites projects to work actively with specialisms from their onset (Muir and Rance, 1995).

In the United Kingdom, amongst 35 Architectural Technology study programmes Accredited by the Chartered Institute of Architectural Technologists (CIAT 2016), most of the programmes are aligned with other related built environment programmes accredited by Chartered Institute of Building (CIOB) and Royal Institution of Chartered Surveyors (RICS). However, there are very few architectural technology programmes that are part of faculty of arts or humanities and associated with Architecture programmes accredited by the Royal Institute of British Architects (RIBA). This paper focuses on the Architectural Technology and the

Environment (ATE) programme at Plymouth University, UK.

ATE Programme at Plymouth University

Currently Architectural technology programme in Plymouth University is an honors degree in the faculty of Arts and Humanities and accredited by the Chartered Institute of Architectural Technologists. BA Architectural Technology and Environment (ATE) program is geared for students who interested in the more technical aspects of buildings, and still want to be involved in the design of buildings. The ATE program thus has a greater focus on construction and environmental technology, and less upon issues of urban design, history and theory in the delivery of buildings.

As part of the then School of Architecture, Design and Environment (now Arts, Design and Architecture), it sits alongside BA(hons) Architecture programme accredited by RIBA and BSc Construction Management (CM) and BSc Building surveying (BS) programmes accredited by RICS, CIOB and the Chartered Association of Building Engineers (CABE) (Figure 1). The ATE programme shares nearly 60% of the modules with CM and BS programmes and has been successfully run with positive students feedback since the inception of the programme in 2008. On the other hand, until four years ago, BA Architecture and ATE were two totally autonomous programmes and the only point of commonality was it happened to being in the same building. In spite of being led by the Architecture faculty members, there was very limited interaction and pedagogic learning between the programmes.

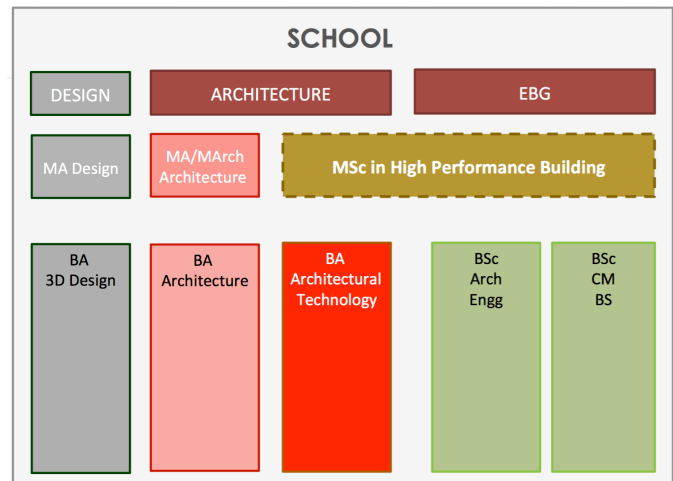


Figure 1. School Structure, Plymouth University, Mar 2015

With the change in the programme leadership in December 2012, the ATE programme is now firmly established as a promising Architectural Technology programme in the southwest of England. The Architectural Technology programme has a clear emphasis on sustainability and it is both research led and research informed and articulated by programme team members research interest (Wright, 2003) (Murray and Cotgrave, 2007, (Altomonte, 2012). The programme also reflect the recent pedagogical developments and enriched by constructively aligning and integrating different modules, learning outcome and assessment across all modules and stages of the ATE programme (Cottrell, 2013, Biggs, 1996).

Design Studio – integrated approach

The central theme of this paper, integrated studio teaching was first established with the final year ATE students working alongside second and third year BA Architecture students in the vertical design studio in early 2013. The key challenge was to bring these programmes together and retain their identities in spite of different sets of learning outcomes and aspirations, with validation from different professional bodies.

the integration process was initiated by instilling a sense of identity for Architectural technology students in the first year. The first year focus is to develop students' confidence, skills and critical

understanding of Architecture Technology and The environment. This was enabled by integrating the design studio and communication modules and the first year modules were restructured for all modules to feed into live design studio project (Figure 2). In this process, focus was on tectonics of making when architecture students focus on conceptual and experiential understanding of design development.

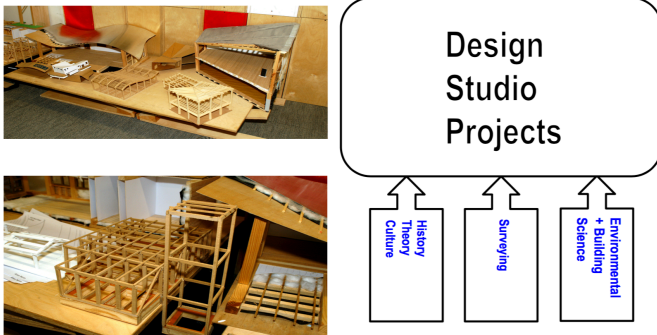


Figure 2. First year ATE students work, Jan 2014

Second year is practice led and performance based and explored the impact of design decisions on human and environmental performance. This was enabled by integrating technology and design modules, where Every work in the technology module was informing the design decisions (Figure 3). Skill set required for ATE students completed by the end of the second year, which not only helped students to opt optional placement year, it gave a sense of confidence to ATE students to work in the design studio with architecture students in the final year.



Figure 3. Second year ATE students work, Jan 2014

In the final year design studio, it would be far too simplistic to use the ‘common project’ as a means to align these subjects. The common ground generally is a research position. This provides students a means to find a way into any given project but through their own particular interests. Students are invited to participate in the design project and group work which enables the student becomes an active ‘stakeholder’ in the design studio environment. The invitation being research based allows the student to find connections between what they are being exposed to from either a theoretical or an empirical position. This knowledge base provides both objective and subjective consideration to inform a design project. Therefore, the first layer of engagement is ‘research based’ and allows the whole community to understand the positions and where the disciplines have differences and where coalescence occurs and synergies can emerge.

The research informed dissertation module sets the platform for ATE and architecture students. Students start the dialogue from the particulars of the acquired knowledge celebrated through dissertations; architecture students come from cultural and theoretical positions and ATE students come from more diagnostic, case study informed condition. ATE students are invited to challenge the norms of how the industry quantifies itself and from that knowledge acquired and to then implement that in a live project scenario working in groups alongside architecture students.

The ways into any given project is to let students to write their own brief as scenario based than being merely descriptive. As shown in figure 4, students are invited to explore different ways of thinking which are equally accessible to both architecture and ATE students.



In looking at architecture in this way the language of the [re]denfied vernacular is not one of form, material or style, but an extraction of **IDENTITY** and through this revealed identity a continuity is formed.



"The milieu within which performance in architecture unfolds may be called topography, indicating neither the built nor the un-built world, but both. Three characteristics of topography sustain the buildings performativity: its wide extensity, its mosaic heterogeneity, and it's capacity to disclose previously latent potential?"

Figure 4. Final year ATE students work, June 2015

Next stage of the design process is to situate the project, which is responsive and a primary ingredient of any given project. The design process is then about setting something that is encountered, testing something, and modifying. which leads to the understanding of the site, which is contextual. This is superimposed with the agenda, which is cultural. Culture could be arts based or performance based and the brief generated through this process is the imagination through their own pre-occupations (Figure 5).

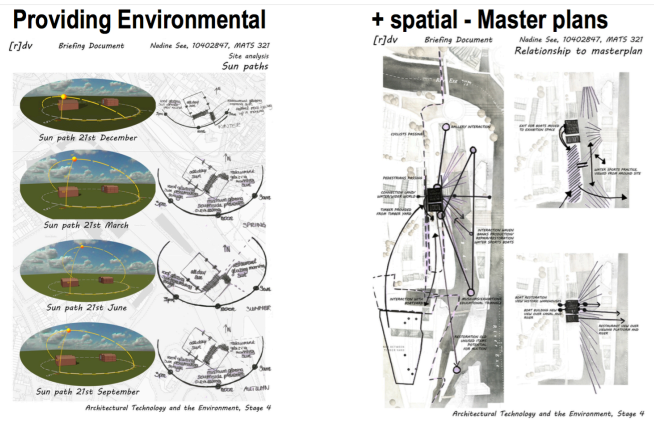


Figure 5. Final year ATE students work, June 2015

ATE students are exposed to spatial issues and understanding of master plan as part of the architecture studio and they club this with the environmental understanding. Spatial approach to masterplans situated from an earlier project based on building upon the case study looking at the buildings on the study trip from diagnostic and performative point of view and challenging that through an experiential condition as well (Figure 6).

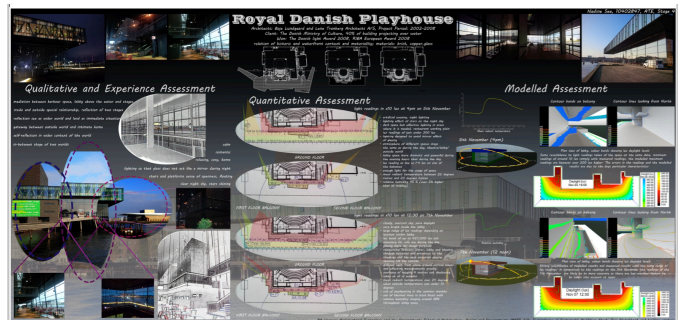


Figure 6. Final year ATE students work, June 2015

At any given territory, there is masterplan which talks about multitude of conditions that students are devised, each taking one project and develop themselves.

The collaborative learning has had positive impact on both BA Architecture and ATE students works. The integration invites a two way dialogue as synergies of influence converge across disciplines as can be seen by these two examples.



Figure 7. Emma Warren, BA Arc year 3 student work, June 2015

Emma Warren and Nadine See worked in the same studio but in different masterplan groups, however studio proximity offered a shared exchange of key skill sets. Emma's work demonstrates the technical resolution inspired by Nadine See, final year ATE student (Figure 7). Nadine's work is clearly inspired by the spatial and experiential understanding inspired by the works of Emma Warren, third year BA Architecture student (Figure 8).

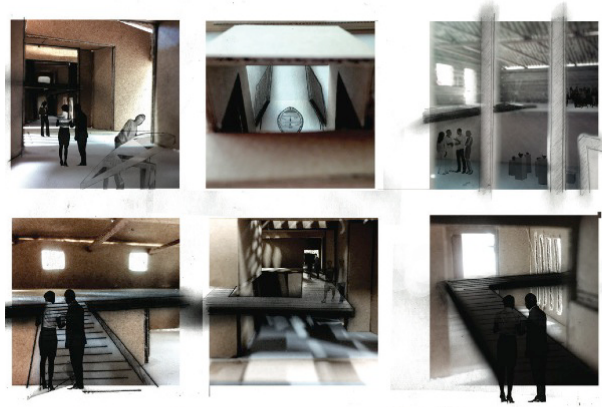
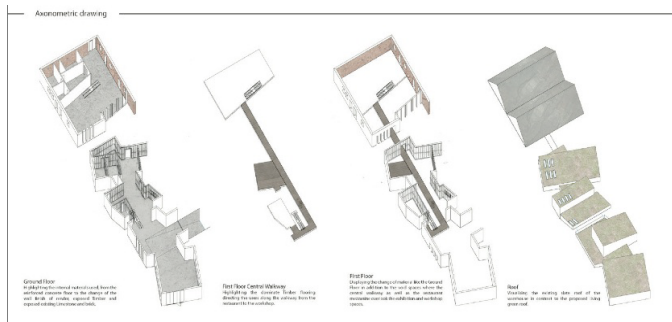


Figure 8. Nadine See, ATE final year student work, June 2015

Significant outcome of this process is that everybody is taking ownership of their project and also understanding it in the broader concept, master plan. There is a broader series of cultural contextual issues that students working with communities are being exposed to (Figure 9).



Figure 9. Final year ATE students work, June 2015

In the final work, experiential and performative are given equal value. To produce a knowing, considered, coherent and collaborative body of work (Figure 10).

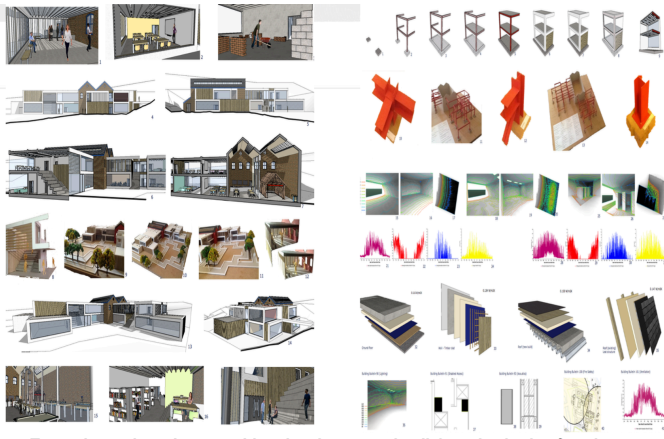


Figure 10. Final year students work, June 2015

Summary

The above integration process is underpinned by the research-based learning in higher education and scaffolded by the Learning Development emphasis on students to be familiar with methods of collecting and analysing data and also provides them with an understanding of the nature of research within the context of the ATE (Hagyard and Walting, 2011). The nature of research is driven by the staff research interest and employability, which has been critical in the emphasis on the sustainable built environment and inspires students through research informed teaching (Jenkins and Healey, 2005, Lee, 2004). The Chartered Institute of Architectural Technologists (CIAT), in their recent Accreditation Panel visit have identified ATE programme structure as an exemplar of good practice and commended the ATE Programme for design studio based teaching and learning.

The whole process reconstructs the ways of working in practice that will allow mature integrated collaborative projects to emerge. It has enabled students to attain greater skill set and hence greater employability rate. This has also enabled us to go beyond skill development and focus on intellectual development.

As demonstrated, the integration has been two way process and has enabled both BA Architecture

and ATE students to develop synergies and improve from each others interaction.

The working methodology above is evidenced through 100% employability rate since the implementation of this model. The success of the integration has encouraged the programme team to extend BA Architecture and ATE studio integration to all three years and benefit from the collaborative learning

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