Teaching Architectural Science: Integrated or Separated?

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INTRODUCTION: In less than three decades from today, two-thirds of the world's population will be living in cities. As cities become more densely populated and new developments are inevitable, more resources are needed to support the livelihood of people. As a result, resource consumptions, and consequently carbon emissions, from cities will continue to increase. Increasing global carbon emissions has been linked to the warming of our environment and climate change, resulting in various catastrophic events as well as the disappearance of various species. In other words, city people's activities, many of which require to be accommodated in buildings, have significant impacts not only on the city environment itself but also and more critically on a much larger scale beyond city boundaries. Thus, planners, architects and building designers have a significant role to play to reduce these adverse impacts and to regenerate our environment that has been exploited to make cities and buildings.

These issues are, of course, not new, and in the School of Architecture and Built Environment at The University of Adelaide, these issues are explored in the undergraduate and the postgraduate programs aiming to help students realize that their design decisions can help solve the problems, or instead can worsen the current condition. In the School, this has been done in two main teaching/learning approaches: by (1) (until 2006) integrating architectural science with, and (2) (since 2007) separating architectural science from, design studio. Which approach is more effective and impactful? So far there is no clear answer to this question as each approach has its pluses and minuses.

METHODS and RESULTS: Until 2006, our School adopted a project-based learning, an approach that was perceived unusual at the time and was not very popular in most architecture schools both in Australia and around the world. Architectural science, environmental issues, and sustainable construction, for example, were taught within design studios, or in studio-like courses. The relevant issues were introduced and discussed during lectures, followed by students, step-by-step, implementing the principles learned during the lectures in their design project, often supported by using certain tools, such as building performance simulation, or certain in-house calculators to help conducting certain analysis of the design. There was a direct relationship between learning the principles, analysing the impacts of design (on certain aspects), and the design process itself. While the outcomes of such approach tended to be designs that were responsive to the relevant issues, many perceived this approach was not doing what an architecture school was supposed to teach, that is to teach 'Design' (with a capital 'D') instead of simply teaching how to design a building or structure that would tick all the boxes.

This critique led to the School to change its curriculum, and since 2007 both the undergraduate and postgraduate programs have separated the teaching of architectural science, environmental issues, construction (and history) from the design studios. This, in fact, is the common approach adopted by most architecture schools around the globe. Design studios (or design studio courses) are treated as the core of the curriculum, supported by other courses to teach 'important' issues. With this approach, students do have a lot more time to explore and develop design (form making), and are able to come up with seemingly more 'exciting' designs. The problem is, these designs do not necessarily reflect the principles and address the problems that are explored in the supporting courses, such as courses about the Environment that explore the relationship between design and environmental impacts and how to minimize the environmental impacts of design and come up with net zero carbon developments. So, which approach is more effective to train students to be a good architect with a good Design for the environment?

The presentation will discuss both approaches, each with an example (a course), its structures and student work. A new design studio focusing on architectural acoustics will then be presented, whereby the balance between teaching design and aspects of architectural design seemed to be successfully maintained, resulting in an exciting but well-considered design. Lessons learned from this new course will be contrasted with the two approaches above and offered as a possible solution.