BIM: A Transformative Technology within the Architectural Curriculum in Schools of Architecture (Pedagogic Stages of Architectural Education and the Transformative Effect of BIM)

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ABSTRACT

Building Information Modeling (BIM) has made a considerable impact on the construction industry and the way in which building design information can be accessed and interrogated. This impact is now being seen in the Schools of Architecture in the UK. Academia is beginning to see the feasibility and benefits of converting to such a new technology; will this inevitably start to filter into teaching BIM to architecture students? The concern by many in academia is that design will become secondary to pedagogy of building design. This viewpoint is based on the impact of CAD, where the art of hand drawing was feared lost forever. The use of computers in schools of architecture has become the norm, and the creative moving of a pen across paper has been replaced, to a degree, by the cursor across the CAD screen. As academia moved to respond to this change, the need to teach CAD became increasingly important. Therefore, will the paradigm shift of BIM require the inevitable move to a new approach in the design and construction of buildings? There are many misconceptions of BIM and the dilemma is that those teaching within the schools need to understand how BIM can readily interface with the design process and allow interrogation of the design are far earlier stages of the concept. Will academia ensure that BIM is used to enhance the creative process not hinder it?

Keywords: Architectural Technology, Architecture, Building Information Modeling (BIM), Design Education, Learning, Pedagogy, Teaching, Technology

INTRODUCTION

Within Schools of Architecture the curriculum is designed to ensure it mirrors the needs of the industry. As such it is a main feeder to the core teams that will design and create the buildings now and for the future. With schools having such a critical position, they need to ensure that current directions and needs of the industry they feed are identified with considerable focus. As the industry heads towards an integrated and seamless approach to design that includes services, structure within the architectural envelope. As it seems with all aspects of life new

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technology and its influence on how we live and work will get ever greater. The current trend with construction seems to follow this increasing curve. Implementing BIM at initial stages of design to allow every element to be integrated with relative ease and minimal issues on site can only be seen as a strong move forward. However, as BIM has gained ground within the industry over the last 6 years have schools moved to reflect these advances? As industry expects more and more from our graduates, how can we ensure they are also ahead of that curve and fully conversant in the language of BIM now the new dialect of design office and site.

In 2006 BIM had begun to make its mark on the industry, the magnitude of its impact was reflected in Reports and Papers around the UK and wider afield. At this stage, the research showed that although the industry needed BIM ready graduates, schools of architecture were still resisting change. Currently architectural design is still taught as a process that embodies the freedom of the traditional of drafting with pencil on paper. Although from my studies I have also seen that more proactive schools have embraced the technological benefits of computers in terms of visualisation or CAD drawn plans. However, it still remains that the initial focus in early formative years of architectural education is still strongly focused on the form and function of spaces and their architectural form explored by hand, with little use of computers.

It is this process of change within architectural curricula that this paper explores, now 6 years on and the use of BIM in architectural education is still a subject of much debate. The Building Information Model represents a fundamentally altered medium from the traditional representation in contemporary practice of architecture (Ambrose, 2006). However, this altered approach brings with it many benefits and a richer appreciation of the very design being formulated within schools around the UK. If BIM brings such benefits why is it not fully integrated into the architectural curriculum? The construction industry is now approaching full integration and seamless integration for those that use BIM, so why are we not educating our architectural graduates to stream into such working environments with seamless curricula?

This paper will investigate the reasons behind the complications of BIM implementation in curricula by using both an initial forming survey and then structured interviews of current graduates from the School of the Built and Natural Environment, June 2012. The paper is structured as follows. First, we have an overview of technological change literature will be presented and will introduce the concept of BIM in curricula. Next, we will describe how the data is collected and analysed in this study. Then we explain the results of this study. Lastly we will conclude the findings.

BIM TOWARDS AN INTEGRATED APPROACH

Previous papers have indicated that there is mixed opinion on the timing for implementing BIM into the design curriculum in schools. The underlying connection between these two diverse conclusions is that there is a need to ensure our cohorts are fully conversant with technology and become ‘technology ready’ at the point of graduation. This readiness is now firmly focused around an integrated design approach.

Seletsky (2006) argues that from a holistic design standpoint that BIM should be immediately implemented in schools as it will revolutionize teaching architecture. However this was not in line with current studio learning within the school. This approach ‘layers’ the learning of architectural design in terms of space, materiality and social context. These layers are built up to ensure the cohort understands both the detail that should be considered within design and at what stage of the process factors should be considered. However, Cheng (2006) concluded that in terms of BIM integration to the learning journey of schools the integration should be slowed down the implementation of BIM to insure the proper introduction of this design tool. Ensuring that the cohort understand
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