Trivarsity, Interdisciplinary BIModelling/Management (BIM) Workshop: An Action Research International Example

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ABSTRACT

This article demonstrates the evolutionary development of a series of inter-varsity, interdisciplinary, collaborative architectural design/management workshops, using industry-standard BIM software, within a community of academics, students and practitioners in Danish, Irish and UK architectural technology (AT) universities. This article, per the authors, proposes that the current digital revolution in the architectural, engineering, construction and operations/owner-operated (AECO) sectors, necessitates a planned change process to simulate 21st century, interdisciplinary, professional practice in academia. The action research methodology of this is outlined. After each of the four dynamic and cyclical stages, the reflective practitioners discuss their development of the professional curriculum: defined as an active-learning process. The students are active collaborators: joint change agents in a process of transformational learning as future employees and ambassadors for the benefits of collaboration utilizing information communication technologies (ICTs).

KEYWORDS

Architectural Technologist Emerging Role in BIM Adoption, Collaborative BIM Workflows, Constructive Alignment of AECO ICT Education and Practice, Simulated Cloud-Based Collaboration

INTRODUCTION

The negative effects of adversarial attitudes among those from Architecture, Engineering, Construction and Operations/Owner-operated (AECO) backgrounds in the industry has been highlighted by various reports advocating the need for inter-disciplinary working skills from those entering practice. The education of those in the AECO sector is determined in collaboration with professional bodies and educational quality assurance agencies (e.g., QAA, 2014; QQI, 2016) that ratify this recommendation. This presents a challenge for Higher Education Institutions (HEIs) to devise opportunities for collaborative working across disciplines, traditionally educated in ‘silos’ and, more importantly, to

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encourage innovation in the assessment of the learning involved. The challenge often necessitates an attitudinal shift within the educators in HEIs, often accused of mimicking and perpetuating said adversarial behaviours in practice, and accustomed to autonomous working (Schein, 1972). The educators in this research came together initially, through International Congress on Architectural Technology (ICAT) networking and Erasmus exchange, as professionals who aim to use their research to improve their and their students’ effectiveness as practitioners. They identify a feasible ‘specific change target’ to instigate a change process towards collaborative design and information management education (Schein, 1972): a collaborative Building Information Modelling/Management (BIM) project to simulate the problems of 21st century, inter-disciplinary practice. This takes the form of a yearly tri-varsity, inter-disciplinary, fictitious collaborative design workshop using BIM and cloud-based information communication technologies (ICTs), devised in collaboration with Danish, Irish and UK architectural technology (AT) HEIs, professional practitioners and software developers. The workshop introduces collaborative (BIM) workflows to the students across the three institutions: primarily with students from Architectural Technology (AT) and Construction Management programmes, but later includes Sustainable Energy Engineering (SEE4) and Quantity Surveying (QS4) students. The multi-national approach allows staff and students to experience and learn from the implementation of BIM within other institutions and to appreciate and learn from the nuances of each AT programme.

This article presents the cyclical process of the development of the workshop following its inception through its four evolutionary sessions to date; Sheffield Hallam University (SHU), March 2015; VIA University (VIA), October 2015, Waterford Institute of Technology (WIT), November 2016, and SHU, November 2017. In seeking to explore the implementation of effective strategies in the application of ICTs in architectural technology practice, during and at the end of each workshop the collective use their findings to generate possibilities for change which are then implemented and evaluated as a prelude to the further investigation in the subsequent workshop (Denscombe, 2014). The fourth workshop extends the participatory action research to co-collaborators from professional practice enhancing opportunities for change; a positive, paradigmatic shift (Kuhn, 1996); away from adversarial relationships between the AECO disciplines in practice and education, and for an evaluation of the impact of the findings on inter-disciplinary practice.

BACKGROUND

Devising Architectural Technology Education Collaboratively

The concept that the project team in practice is composed of ‘domain experts’ each with well-defined and explicit fields of knowledge (Penn, 2008) is recognised in this research. Emmitt (2002) states that over the last fifty years successive government reports and much research have encouraged those in the building industry to work more collaboratively to repair the damage done by increasingly fragmentary and adversarial relationships. Egan (1998), building on Latham (1994), states that whilst the UK construction industry at its best is excellent, there is too much client dissatisfaction, low profitability and little investment in capital, research and development, and training. The Egan report is the work of a Task Force of industry specialists informed by their experience of radical change-to-improve in other industries. It recommends five key drivers of change; committed leadership, a focus on the customer (client or end-user), integrated processes and teams, a quality driven agenda, and commitment to people. The way of achieving reduced cost, construction time and defects is through radical changes to the processes by which projects are delivered: specifically, through the creation of a more integrated design and construction process (Egan, 1998).

On consideration of the three main phases of a construction project; conceptual design, detail design, and site assembly; there are two identifiable links in these three sequential activity areas where the transference of information is crucial to the faithful realisation of the building project from conception to completion. Architectural technologists are ideally placed to act as this constructive
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