Education, Design and Practice – Understanding skills in a Complex World

• Paper / Proposal Title:
A Delusion of Innovations? An exploratory study investigating micro-level barriers to an effective macro-level BIM diffusion

• Author(s) Name:
Melanie Robinson; Prof John Currie; Dr Andrew Brown

• University or Company Affiliation:
Edinburgh Napier University

• Abstract (300 words):
Building Information Modelling (BIM) is being hailed as the solution to a rapid digitisation of the traditionally stagnant construction industry, with the UK leading much of the global drive to strategize the macro-level adoption of BIM. However, in an inherently competitive environment borne from the heterogenous, project-based nature of the industry, there is a risk that a disjoint may exist between rhetoric and reality. Furthermore, figures from commercial studies suggest that barriers to effective macro-level diffusion may instead lie at the micro-level (i.e. individuals) rather than at the meso-level (i.e. organisations and projects) which has formed much of the academic focus to date.

This paper appraises BIM as a systemic innovation comprising people, process, and technology constituent elements. The adoption and assimilation of BIM therefore requires practitioners to develop a myriad of competencies, inter alia: hard skills, (e.g. how to interact with BIM-enabled tools), soft skills, (e.g. how to collaborate efficiently), and knowledge of the fundamental components underpinning the digital workflows. In an industry with a renowned dysfunctional training delivery model and a world with
increasing reliance on internet-based, unstandardized knowledge acquisition, it is crucial to consolidate the role of BIM competency with adoption rate assessments.

Drawing on innovation diffusion theories, the research employs an in-depth literature review to ascertain how systemic innovations behave when diffusing across a project-based population. To contextualise the findings, an exploratory focus group study is used to provide a multi-level perspective on how the role of micro-level competency-based factors may be influencing the perceived rate of macro-level BIM diffusion. The results support the narrative that a so-called "assimilation gap" effect may be influencing perceived BIM adoption. The study aims to provide a gateway to establishing a robust BIM adoption assessment framework by challenging the current UK upskilling model and its effectiveness in a digital world.

• Author(s) Biography (200 words each):

Melanie is a PhD candidate based within the Institute of Sustainable Construction at Edinburgh Napier University. She graduated with First Class Honours in Architectural Technology in the summer of 2015 with two industry placements, a proactive role in supporting women in STEM as an Equate Champion, a scholarship, and two awards under her belt. Melanie started her PhD in late 2015, exploring the role of micro-level barriers to an effective macro-level diffusion of Building Information Modelling (BIM) in the UK. She is a winner of the University’s 3-Minute Thesis competition and the Principal’s Research Excellence Award 2018. Melanie is also currently involved with the Scottish BIM Delivery Group’s Academia panel and the UK BIM Alliance as a project member on their upskilling stream. In addition to these roles, she has completed a contract as an industry-focused research assistant for a BIM competency framework feasibility study on behalf of the Scottish Futures Trust. Melanie is an active member of multiple University-based committees and serves as a BIM content consultant and occasional lecturer for multidisciplinary undergraduate and postgraduate modules.