

# **Exploring ways to tackle the challenges of the need for skills and training in the implementation of Building Information Modelling: a case study of two leading UK construction companies**

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# Construction industry challenges

- Construction 2025:
  - the construction industry needs a capable workforce to deliver lasting transformational change.
  - employers are facing difficulties in attracting skilled employees and 13% of employers reported not having enough skilled employees for some of 2014.
  - If not addressed, this skills gap will lead to inflation and reduced productivity in the way the industry operates (Infrastructure and Projects Authority, 2016:9)

- Issues of training, skills and education around BIM have been raised by a range of researchers as either as a barrier to BIM adoption or as a critical success factor in BIM implementation
- The importance of BIM skills and upskilling personnel as a fundamental element for BIM application in construction projects have been mentioned in all studies which discuss the critical success factors for BIM implementation (Amuda-Yusuf, 2018; Liao & Teo ,2017)
- The lack of expertise and skilled personnel, and a lack of training, are some of the critical barriers to the uptake of BIM and to taking advantage of its benefits (Saka & Chan, 2020; Oestrich & Tueteburg, 2019; Gledson et al, 2016; Lee & Holar, 2013; Wong et al., 2011; Gu & London, 2010).

However

*There is a dearth of research studies to identify the necessary skills and knowledge to overcome these challenges (Saka & Chan, 2020)*

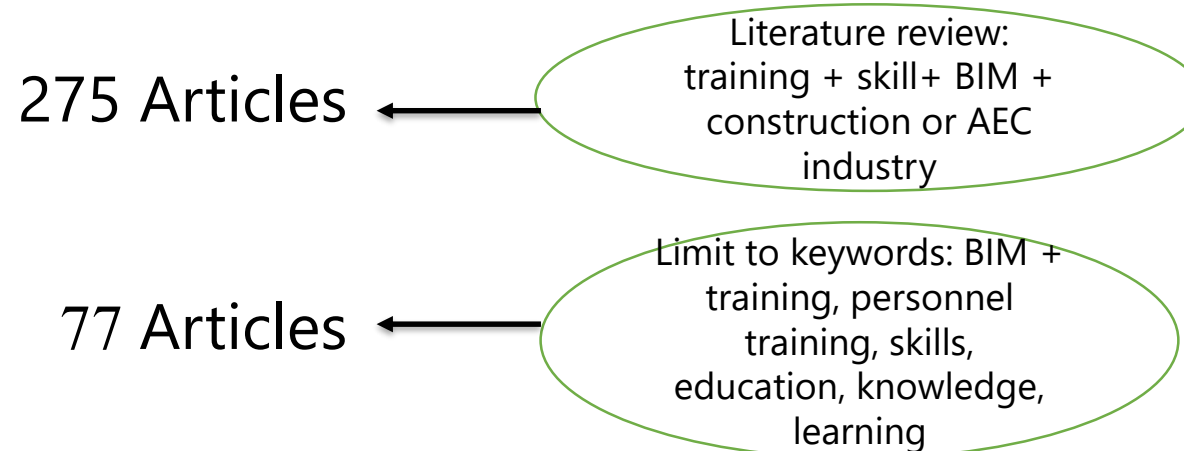
# Purpose of this study

To look more deeply at BIM skills, and to find out:

- What skills, processes and practices do construction companies require?
- What should be considered when developing a training strategy at inter- and intra-organisational levels?
- What are the essential factors needed to successfully upskill employees?

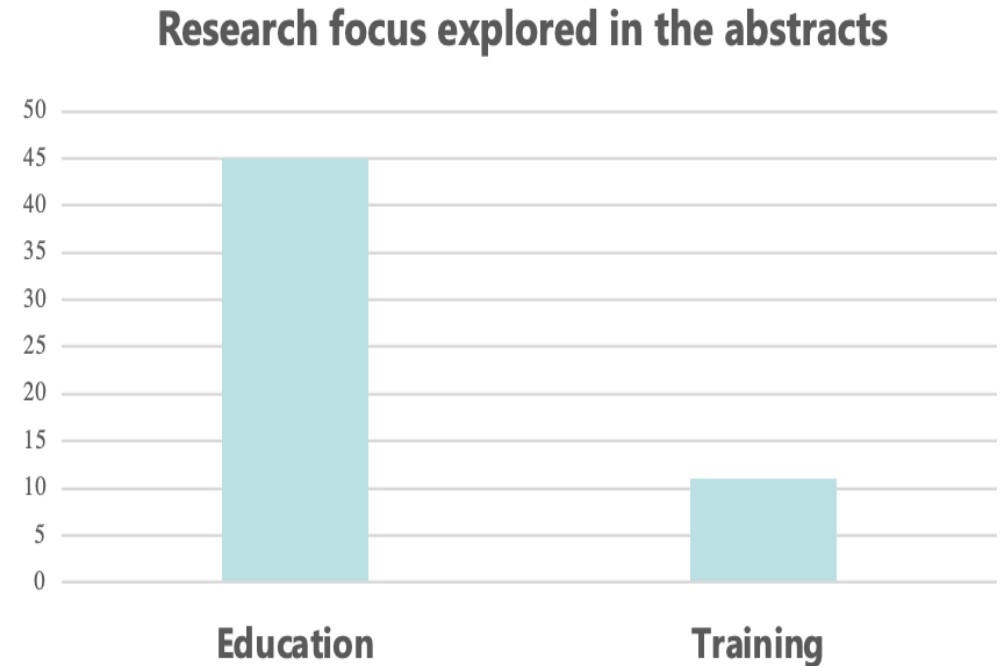
# Literature review

- The research adopted a systematic approach to gather the existing literature on BIM training in AEC industry areas
- We drew on the academic data base within Scopus for the data gathering
- The Scopus search was conducted on 1 October 2020. It involved using the keywords 'BIM', 'training' and 'skill' combined with 'construction' and 'AEC industry'



# Literature review

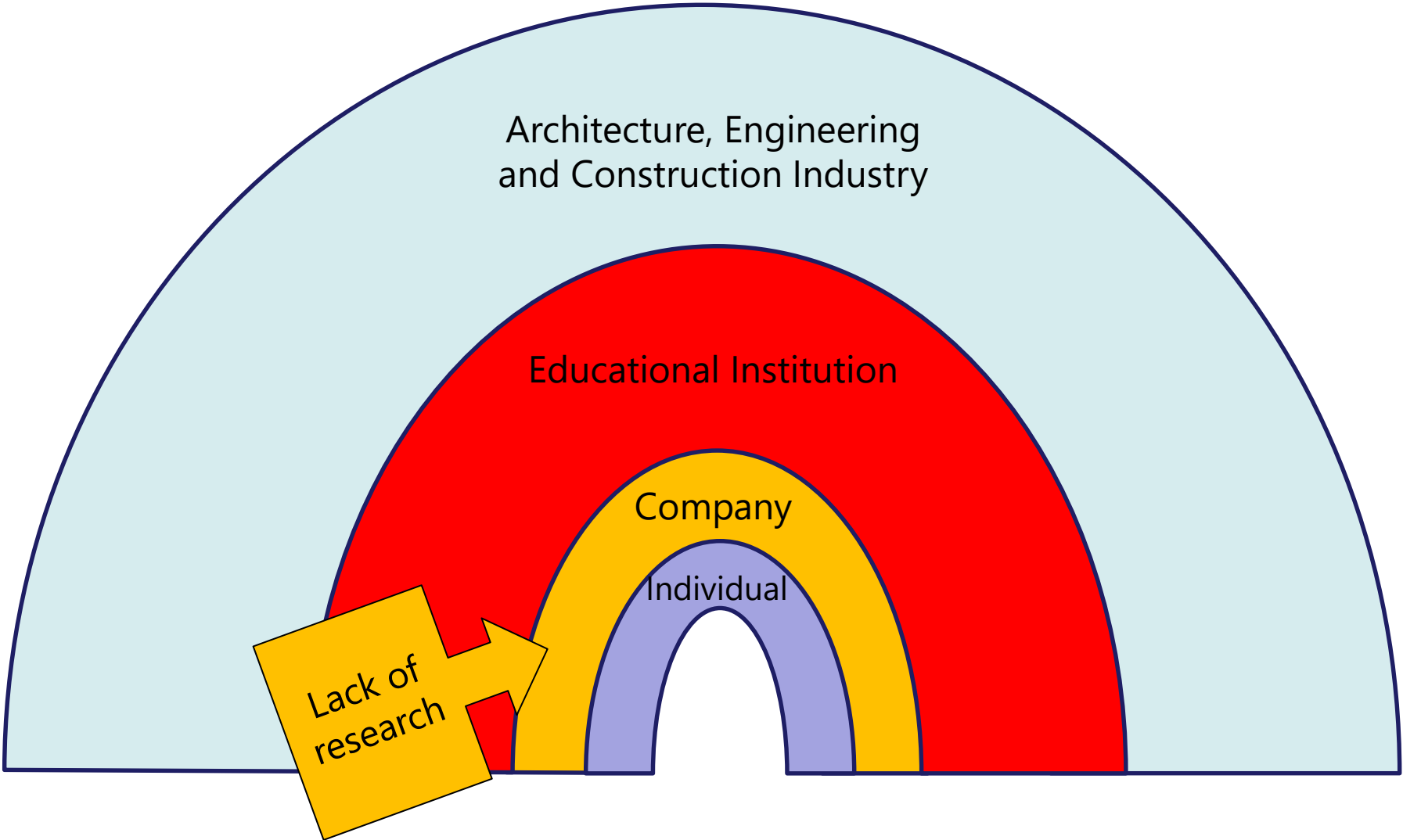
- The abstracts of the remaining 77 records were reviewed to define their focus
- 11 papers studied the issues of training and skills around BIM for the construction workforce (predominantly at the industry level)
- 45 studies explored BIM-related skills in the programmes and curriculums of educational institutions



# Gaps in the existing research

- Most of the existing literature has focused on the requisite technical-related skills and training in the construction industry
- There is a gap in understanding of the skills, process strategies and practices required by construction companies to upskill their employees
- Soft skills such as collaboration, communication and process-related competencies have not received enough attention

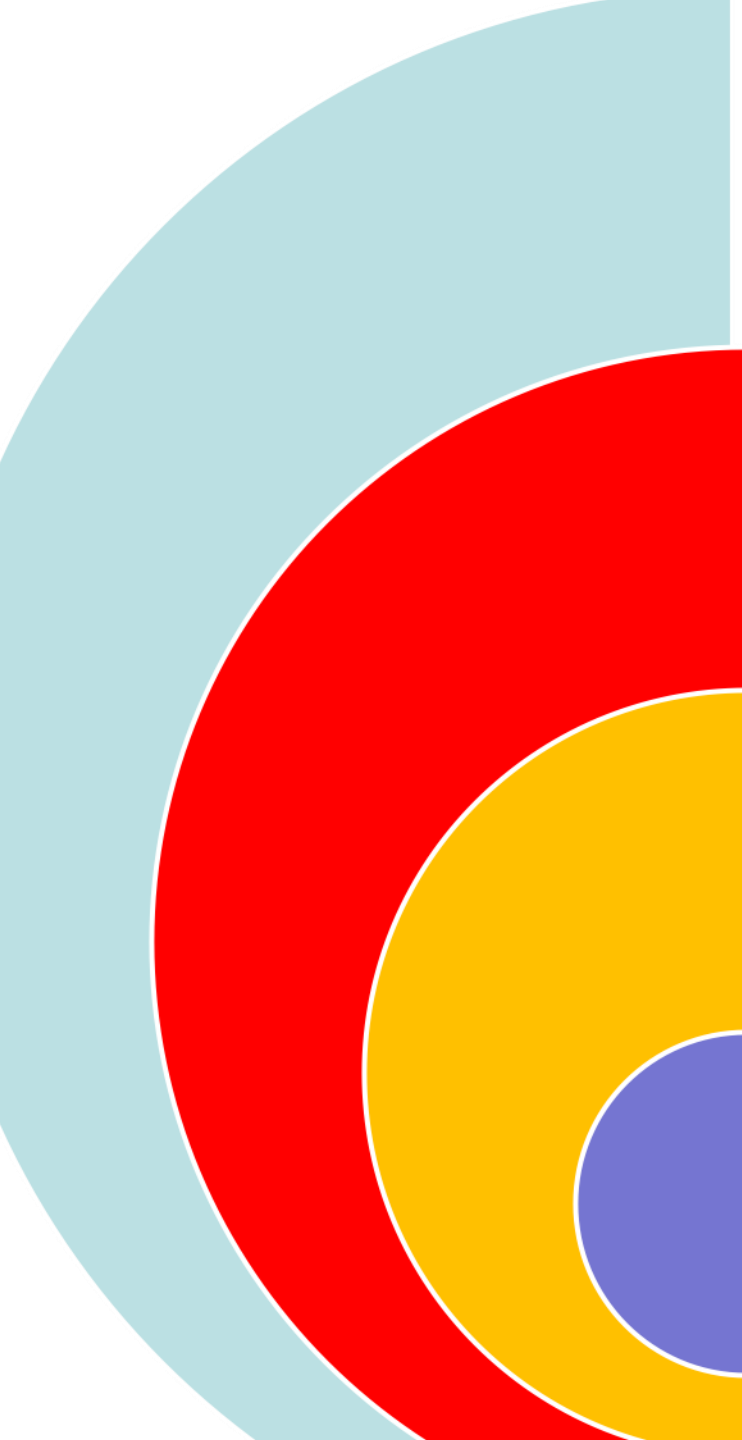
# Conceptual Framework for BIM Training in the AEC Industry





# Research Methodology

- This research is based on a qualitative study of the challenges that general contracting companies encounter with BIM training and upskilling their employees, the methods they use to tackle those challenges, and the strategies they employ to ensure that their project partners across the supply chain are appropriately trained.
- Two companies from the Top 10 Construction Companies (The Construction Index, 2019), which had been shortlisted for Building Innovation Awards (2019), were selected.



## **AEC Industry**

- BIM-related training
- Profession-specific training
- Broader digital literacy

## **Educational Institution**

- BIM-Related curriculum
- Integrated construction/design skills with digital skills

## **Company**

- Tailored training
- Collaboration and communication training
- Role-specific training

## **Individual**

- Motivation to learn
- Teamworking
- Mindset

# Findings

- Skills and training challenges
- Different levels of digital literacy and competency among employees
- Individual resistance to change
- Challenges when dealing with multiple supply chain partners
- Need for supportive and capable digital managers

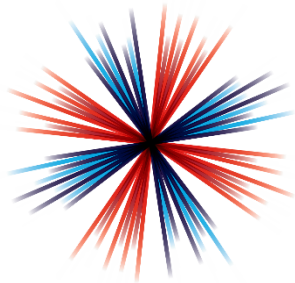
# Findings

- Intra-organisational strategies
  - 'in-house' training strategies
- Inter-organisational strategies
  - progressive approach
  - 'treat suppliers like employees'

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