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Impacts of Quantitative Research in the Built Environment

Tweet: #meaningofnumbers

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Programme for the Day

Time	Description
10:00am – 10:20am	Welcome, Introduction and Setting the Scene
10:20am – 11:00am	Project-related failures, and problems of quantitative-only enquiry *Danstan Chiponde, Northumbria University* Comparing the social value and sustainable development goals agendas: An application in large-scale infrastructure case studies *Cara Mulholland, The University of Manchester*

Combining the strengths of UMIST and The Victoria University of Manchester

ARCOM Research Workshop
26 February 2019

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Time	Description
11:20am – 11:55pm	Performance measurement for construction projects *Kejun Meng, The University of Manchester* Influence of co-creation practices on ambidextrous learning in project settings: PLS-SEM approach *Yan Liu, TU Delft/UCL* System integration in digitally-enabled modular construction *Ruoheng Zhang, Imperial College* Using hybrid simulation to model construction operations *Orsolya Bokor, Northumbria University* Multiple linear regression models to predict embodied carbon emissions during early design of buildings in Sri Lanka *Amalka Nawarathna, Northumbria University*

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Time	Description
12:05pm – 1:05pm	Lunch How APM can support early-career researchers and their supervisors? *Daniel Nicholls, Association for Project Management*
1:05pm – 2:00pm	The inexact science of construction statistics and the impediments to accurate measurement in the real world *Stephen Gruneberg, UCL* Exploring the quirks when comparing regional data on 'activity' *Brian Green, Brickonomics* Construction statistics: What are we trying to measure? *Noble Francis, Construction Products Association and UCL*

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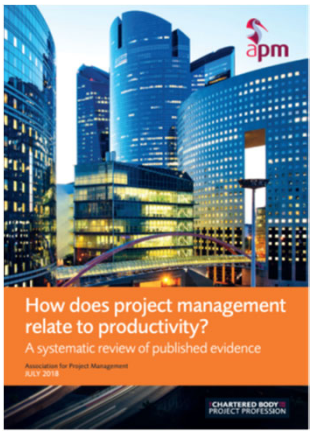
Project Management and Productivity



" […] the purpose of our systematic review is to examine published evidence to establish quantitatively and qualitatively how project management can contribute to productivity."

- To determine the value of project management…
- To compare productivity studies of a range of project-based industries…
- To highlight key project management practices that enable productivity improvements…
- To produce qualitative vignettes.

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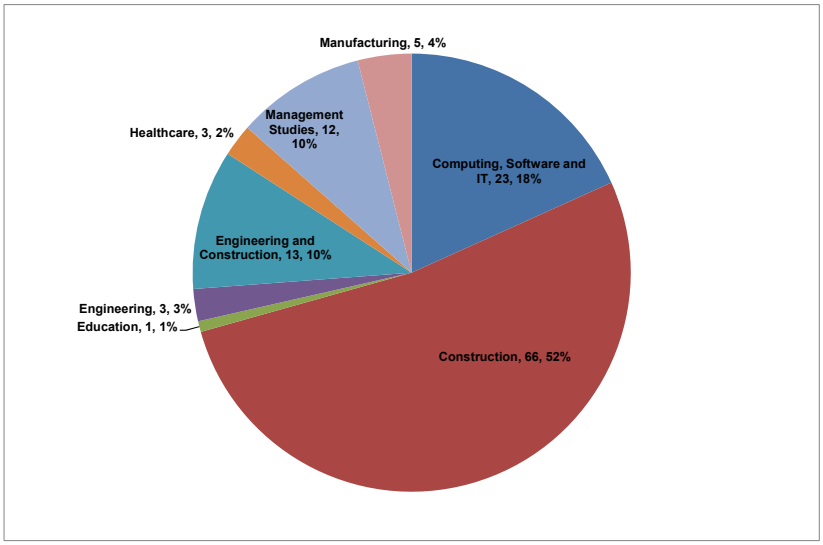
Sector Focus of Studies Reviewed



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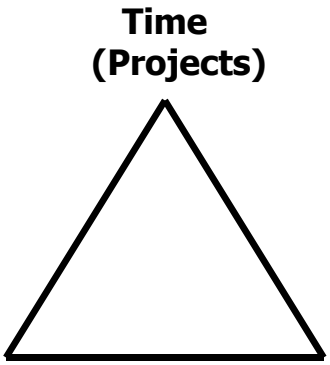
The Iron Triangle?



Cost (Programmes)

Quality/Value (Portfolios)

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Key Findings and Observations

- Reliance on self-reporting and self-perception data
  - Few studies that measure actual productivity
  - 'Project Management' and 'Productivity' are ill-defined
- Case studies that claim causal factors that lead to productivity improvements
  - Analysis of project-based work rather than project management per se
  - Focus on repeatable tasks rather than projects as a whole
- Modelling operations and conditions of productivity
  - Based on the specific interests of the researcher
  - Assumes a linear plan-predict rationale that remains untested

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Questioning 'Normal' Organisational Science

"Normal organisational science does not examine the relationship between problems and explanations but examines that between independent and dependent variables. **Research methods, rather than the problems and needs of managers, workers and policy makers, drive research** […] The original problems that stimulated the creation of organisation studies fade into the past and problems are now derived from review essays and statistical models."

Source: Marsden, R. and Townley, B. (1996: 666; **added emphasis**) The Owl of Minerva: Reflections on theory in practice". *In*: S. Clegg, C. Hardy and W. Nord (Eds) *Handbook of Organization Studies*. London: Sage. pp. 659-675.

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A Recent Critique in Built Environment Research

"[…] research on BE are behavioural-oriented, yet people use quantitative methods instead of qualitative methods. This always produced misleading results and faulty recommendations."

"It is indeed very worrying to think that over 90 percent of our research activities are embedded in quantitative research in an era where the BE challenges is such that there is increasing need to know more and more of less and less."

Source: Umeokafor, N. and Windapo, A. O. (2018: 210) Understanding the underrepresentation of qualitative research approaches to built environment research in Nigeria. *International Journal of Construction Education and Research*, **14**(3), 198-217.

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Use of Numbers in Policy & Strategy

- 33% reduction in the initial cost of construction and the whole-life costs of built assets.
- 50% reduction in the overall time, from inception to completion, for newbuild and refurbished assets.
- 50% reduction in greenhouse gas emissions in the built environment.
- 50% reduction in the trade gap between total exports and total imports for construction products and materials.

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Questions for Reflection?

1. What kinds of 'numbers' are we producing in quantitative research in the built environment?
2. What problems and challenges do researchers face when producing these numbers?
3. How do researchers intend for these numbers to be used – by researchers, policy-makers and practitioners?
4. What do these numbers do in practice? How are these actually used (or mis-used) by policy-makers and practitioners?
5. What kinds of impacts are we producing?