



**UNIVERSITY OF  
CAMBRIDGE**

Department of Engineering

## **CONSTRUCTION ENGINEERING MASTERS DISSERTATION ABSTRACT**

### **From “Master Builder” to having the “Right Stuff” – Can the use of checklists help construction follow aviation and medicine into the era of discipline?**

Errors and rework in construction are endemic and productivity is stagnant. Meanwhile, the global need for infrastructure and buildings continues to grow. Construction costs could be reduced by minimising the frequency of errors, thereby enabling more of the global need to be met.

Medicine and aviation have transitioned from the celebration of individual skill and talent to the appreciation of complexity and the avoidance of human error. The model presented by the World Health Organisation’s Safe Surgery Checklist is the transition from total freedom and autonomy of specialists, working under high pressure in their own heads, to specialists working with the normal and mundane described in simple, easy to use checklists, freeing them to concentrate on the unusual and unexpected. This approach has substantially reduced postoperative complication rates, 36% on average.

To test the impact of this type of checklist methodology in the construction context, this study assessed its use on two concrete cores, with a control core for comparison. All three cores were built on the same site, at the same time, over a 25-week period, each with a different team. The specification was a high quality, architectural concrete finish with a high degree of accuracy in position. The measures used were the number of aesthetic defects and the positional variance before and after the introduction of the checklist.

The study identified a greater than 90% improvement in the number of aesthetic defects but no change to the positional accuracy. In follow up interviews, the teams involved in the trial are positive about the use of checklists of this type in the future and have gone on to develop their own checklists for specific operations. Interviews with a wider group of construction practitioners identified resistance to more paperwork but a desire for more, better checklists as part of the solution to improving errors and productivity in construction.

**Manos Adoniadis**

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