UNIVERSITY OF CAMBRIDGE
Department of Engineering

IfM MANAGEMENT TECHNOLOGY POLICY

Strategic Technology and Innovation Management Programme 2019

Digitising human work: Experimental results

Aims

Current **challenges** in **manufacturing**:
- Increasing complexity of production
- High flexibility of processes for individualised products (batch size one)

» **Trained human workers** are **central enablers** to adapt to these challenges

VR is a **promising tool for training**:
- Constraints of the real world are eliminated: costs, safety, availability, …
- Many features to enhance learning: interactivity, multimedia, cueing, …
- Learning effects require more research

Progress

- **Experiment with** 120 industrial apprentices and employees
- Participants received different **training methods** for a manual task **in three groups**: conventional paper manual (1), basic VR (2), VR with optimised instructions (3)
- **Learning outcomes** were **measured** during subsequent execution of the real task

Figure 1: Impressions from the experimental

Results

Optimised VR training resulted in significantly **improved productivity** and **quality**

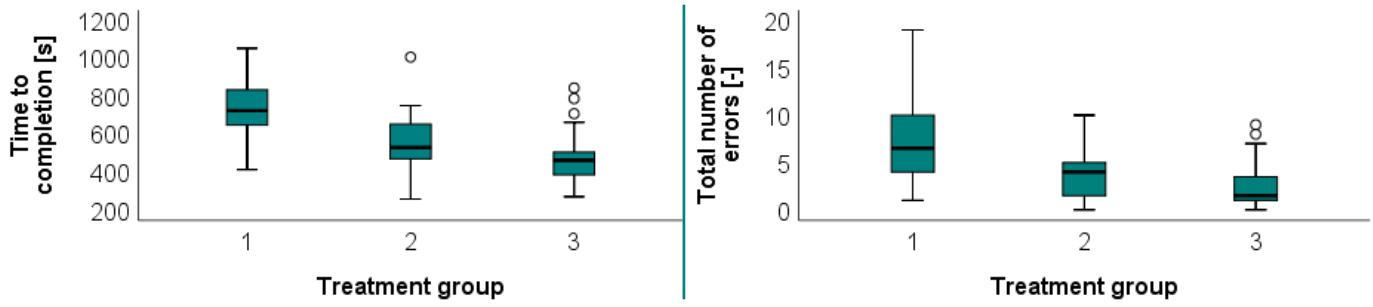

Figure 2: Time to completion (left) and committed errors (right) during the real task execution

Conclusion and Outlook

- Results provide **empirical evidence** for the **effectiveness of VR training** with an **engineered instructional design** for training applications in manufacturing
- **Future research** needs to build upon these results and examine individual instruction principles as well as effects on skill retention

Contact: Dr Thomas Bohné (tmb35@ccam.ac.uk)