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Improving Operations Management Education and Training with Physical and Virtual Reality: An Experimental Approach to Evaluating Student Engagement and Experience

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Abstract

The COVID-19 pandemic and its aftermath have sparked a shift in how Higher Education Institutions approach the use of emerging digital tools to enhance student engagement and experiences. Among these tools, virtual reality is frequently highlighted in the literature for its potential to significantly improve the student experience. However, limited research has explored its effectiveness in teaching operations management, particularly in comparison to traditional physical reality methods such as guided site visits. To address this gap, we developed an innovative experiment incorporating both "virtual reality" and "physical reality" sessions aimed at enhancing operations management education. The experiment began with testing virtual reality headsets in a classroom setting with MSc students in Supply Chain and Logistics Management, focusing on specific scenarios to identify potential technical issues. Subsequently, 34 volunteers from the Business Analysis and Consulting MSc program at Strathclyde University were recruited for the main study. Our analysis showed that integrating virtual reality and physical reality in teaching operations management can significantly enhance the learning experience. However, it is essential to address health-related concerns associated with virtual reality to ensure an inclusive classroom environment. Additionally, some technical difficulties encountered during the use of virtual reality could impact its seamless implementation.

Keywords
Operations Management, Teaching, Virtual reality, Physical reality, Student experience

Biographies
Dr Mouhamad Shaker Ali Agha is an Associate Professor (teaching) in the Department of Management Science where he also received his PhD and MSc. His research interest lies in the areas of supply chain management and Industry 4.0 in general. In particular, he is interested in the supply chain risk and resilience analysis, digital supply chains, operations innovation. Dr Ali Agha is leading a research group that specialized in these areas. Dr Ali Agha is

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also the director of MSc Business Analysis and Consulting and MSc International Master Project Management in Strathclyde Business School.

Mr Dominic Finn is a Teaching Fellow in the University of Strathclyde. He is passionate about delivering engaging and effective learning experiences to undergraduate, postgraduate, and MBA students, both in-person and online. His interests include fostering collaboration, both as an academic focus and as a practical approach to working. Mr Finn has diverse career spanning banking, investment, and a role in an internet start-up, prior to the return to higher education at the University of Strathclyde where he has earned his MSc in Business Analysis and Consulting, followed by PhD research in Management Science, and ultimately to teaching opportunities within the department.

Dr Fahim Ahmed is a Senior Teaching Fellow in the Department of Management Science at the University of Strathclyde, with a primary research focus on the application of Discrete Event Simulation (DES) in healthcare operations. His expertise includes modelling complex problems such as patient flows, resource allocation, and capacity planning. Dr. Ahmed is also deeply interested in problem structuring, simulation education, and innovative pedagogical approaches within higher education institutions. He earned a bachelor's degree in Electronics Engineering from NED University of Engineering and Technology, Pakistan (2005), and a master degree in Systems and Control Engineering from Chalmers University of Technology, Sweden (2007). His professional journey includes teaching roles at leading business schools in Pakistan, such as KSBL and IBA, and at esteemed UK institutions like Loughborough and Warwick Universities.

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