

Title: Investigating the Interrelationships between Advanced Technologies and Safety Performance Factors: The Case of Higher Education Construction Projects

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Abstract: The architecture, engineering, and construction (AEC) industry faces ongoing challenges in enhancing safety performance. Despite the availability of advanced technologies for enhancing safety, there is limited understanding of the inter-relationships among safety factors and advanced technologies for enhancing safety performance. This study aims to investigate the inter-relationships among factors affecting safety performance and advanced technologies. A questionnaire survey was disseminated to construction professionals to assess the criticality of factors and strategies. The data were analyzed using descriptive statistics, correlation analysis, and exploratory factor analysis (EFA). The findings indicate that 16 factors and eight advanced technologies are critical for enhancing safety. The EFA grouped 11 critical factors into four underlying groupings: safety planning and hazard prevention, workplace environment and supervision, employee safety support, and medical readiness and site protection. Moreover, the EFA grouped the eight critical advanced technologies into two underlying groupings: advanced digital technologies and personal and site monitoring technologies. The correlation analysis demonstrates measurable but weak associations between the factors and advanced technologies, indicating the need for future research to explore additional variables that may impact these relationships. The findings help construction professionals prioritize resources to address the specific groupings of critical factors and advanced technologies.

Keywords: Construction projects; Construction safety; Safety performance; Advanced technologies; Higher education construction projects

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