



A Study on the Impact of Age and Seniority on the Effectiveness of Practical Safety Training for Safety Supervisors in the Petrochemical Industry

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ABSTRACT

This study aims to validate the key moderating roles of age and seniority in the effectiveness of practical safety training for petrochemical safety supervisors. Through a quasi-experimental analysis of longitudinal data from 548 supervisors, the findings reveal a significant "dual-track benefit": younger and junior trainees show significant improvement in learning-oriented indicators (e.g., certification bonus), whereas older and senior trainees demonstrate exceptional performance in practical risk control (e.g., reducing audit irregularities). This differentiated outcome is supported by Socioemotional Selectivity Theory (SST) and theories of fluid/crystallized intelligence (Gf/Gc). It also confirms that corporate training and TVET should abandon traditional, monolithic models in favor of a "stratified, adaptive" strategy to maximize the learning potential of a multigenerational workforce and enhance overall organizational safety performance.

Keywords: Petrochemical Industry, Safety Supervisor, Practical Safety Course, Training Effectiveness, Kirkpatrick Model, Socioemotional Selectivity Theory (SST), Adult Learning Theory