# Investigating the Effectiveness and Efficiency of Simulation-Based EHR Training: Media Naturalness Theory Perspective

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*TREO Talk Paper*

## Abstract

Increased use of Electronic Health Records (EHRs) systems has resulted in the need to provide quality EHR training to healthcare professionals. In this paper, we investigate the role of computer-based simulation training (Lateef, 2010; Bell et al., 2008). In simulation-based training (SBT), typical instruction is replaced with tasks that are designed to replicate real-world events or settings and manage an individual's experience in an "artificial" environment (Lateef, 2010; Salas et al., 2009; Bell et al., 2008). SBT can provide students with an improved learning experience that reduces perceived stress and improves EHR task efficiency and performance. This study uses media naturalness and compensatory adaptation theories to explain why, although computer-based training may be considered less natural, it is expected to have a positive effect on performance. While participants may struggle with less natural media at the beginning of a task, they can adapt and compensate for the missing naturalness, resulting in similar or improved performance (Kock, 2005; Kock & DeLuca, 2007). We develop a research model that describes how simulation-based EHR training can mitigate perceived participant stress and augment task efficiency by reducing time to complete EHR tasks, which, in turn, has a positive effect on task-based performance. We will empirically test the model with a unique dataset created from an EHR lab assessment and questionnaires completed by two third-year cohorts of medical students. The measurement instrument was developed based on previously validated instruments and demonstrated appropriate validity and reliability in this study (Kock et al., 2018). To test our research model, we will use partial least squares (PLS), a second-generation variance-based structural equation modeling technique (Chin 1998; Haenlein and Kaplan 2004; Kock 2010). We expect the results to show that simulation-based EHR training enables healthcare providers to reduce perceived stress and complete EHR tasks more efficiently, both of which would have a positive effect on task performance. The findings of this study will help to enhance our understanding of the positive role of simulation-based training, which stimulates individuals to achieve higher levels of efficiency, less stress, and increased levels of performance through the lens of the media naturalness and compensatory adaptation theories. The findings of this study will not only help academics explain theoretical relationships between simulation-based training and performance but also assist practitioners in achieving higher efficiency and effective performance, which are critical for better healthcare outcomes. This study also will enhance our understanding of the role of EHR use experience in modifying the relationship between simulation-based training and performance. This research will make several key contributions. First, the study in this research emphasizes the EHR-enabled performance-related benefits of simulation-based training. Second, this study identifies how (e.g., mediation of stress and efficiency) simulation-based training impacts performance. Third, to the best of our knowledge, this research presents the first study to incorporate the context (i.e., the moderating role of EHR use experience) under which simulation-based EHR training impacts performance. In summary, this study contributes important practical implications by demonstrating an improved method of training health care professionals in the use of EHRs, which will allow them to experience reduced levels of stress, and in turn, provide better care to patients.

### Keywords

electronic health records, simulation, stress, efficiency, time, EHR task performance, healthcare provider.