MOVING TOWARDS A HOLISTIC COMPREHENSION OF TRAINING RESEARCH IN INFORMATION TECHNOLOGY ACROSS INFORMATION SYSTEMS AND HUMAN-COMPUTER INTERACTION: AN EXHAUSTIVE REVIEW.

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Abstract - Exploring concerns in the realm of training and human-computer interaction, researchers share a mutual interest in ensuring users possess proficient Information Technologies (IT) skills. These skills empower users to utilize IT effectively and engage in a positive human-to-computer interaction. Despite Information System (IS) researchers' commendable efforts over the past thirty years to identify optimal methods for cultivating users' IT skills, the current IT landscape presents challenges for organizations in maintaining employee training and keeping pace with skill updates. Consequently, it is imperative for the IS community to proactively address these challenges through targeted research initiatives.

This endeavor initiates a comprehensive review of training research published in major IS and Human-Computer Interaction (HCI) journals over the past three decades. The goal is to amalgamate findings, offer an integrative understanding of IT training research, and suggest avenues for future exploration.

Analysis reveals that while IS research on training has made consistent strides in advancing knowledge about various IT training methods and cognitive learning processes, there remain notable gaps. Previous research has predominantly concentrated on the training program itself, neglecting pre and post-program activities. Additionally, a limited set of theoretical foundations has been employed, and the focus has often been on specific topics and single-user systems rather than holistic enterprise systems. Crucial aspects such as enhancing user motivation before training, ensuring the transfer of training skills to the workplace, evaluating training effectiveness, and supporting continued user learning post-training have not received adequate attention.

Identifying these gaps, the study highlights various research opportunities by delving into less-explored theories. Researchers are encouraged to continue addressing these gaps and developing innovative methods to facilitate employee learning through emerging channels like e-learning and social media.

I. INTRODUCTION

Fostering proficiency in computer skills is a pivotal aspect of enriching human-computer interaction (HCI). In one of the pioneering books addressing human-computer interaction in the Information Systems (IS) realm, Te'eni, Zhang, and Carey (2007) underscored the significance of user proficiency. They emphasized that a harmonious relationship between users and technology relies not only on superior design but also on effective user training, explicitly stating, "Training is part of creating effective HCI" (Te'eni et al., 2007, p. 9). From an organizational standpoint, this underscores the necessity for employees to acquire proficiency in utilizing information technologies (IT) to seamlessly interact with technology and realize its potential benefits fully.

Organizations consistently invest substantial resources in in-house training programs and external certifications to enhance their employees' IT skills, as revealed by surveys on organizational practices (Allen, 2008; Dolezalek, 2005). According to a recent training industry report (Miller, 2012), U.S. organizations allocated approximately $156 billion to employee learning and development in 2011, with a notable shift towards technology-based training, constituting nearly a third of all training deliveries.

Recent reports indicate a rising trend in investments in training, driven by the emergence of new technologies and delivery methods such as e-learning platforms (Allen and Seaman, 2011; Green and McGill, 2011). Businesses find it increasingly challenging to train and update their employees' skills due to the rapid introduction of new technologies and the widespread availability of new training conduits such as e-learning and social media. The decentralization of the workforce across the globe adds an additional layer of complexity to providing structured IT skill development for employees (Santhanam et al., 2010).

Recognizing the pivotal role of training in facilitating technology interactions, the Information Systems (IS) community has devoted significant research efforts to explore and provide recommendations for the design of IT training programs over the last two decades (e.g., Compeau et al., 1995; Santhanam et al., 2010). However, a comprehensive overview of accumulated research findings on IT training is lacking due to the

absence of efforts to synthesize disparate findings. This gap hampers the ability to reflect on past findings and chart future research courses that can effectively address evolving challenges in the IT training landscape (Webster and Watson, 2002).

While there is an existing study consolidating some IT training research, it primarily focuses on training methods (Gupta et al., 2010) and is limited to synthesizing concepts rather than providing a detailed, in-depth literature survey of research findings and patterns. Moreover, it does not encompass research in the human-computer interaction domain, where numerous studies on computer training have been conducted (e.g., Grudin, 2006; Olfman et al., 2006; Zhang and Dhillon, 2003; Zhang et al., 2004). Prominent journals dedicated to advancing HCI research, such as the International Journal of Human-Computer Studies, feature numerous research studies on IT training, further emphasizing the need for a comprehensive review encompassing both IS and HCI domains (Zhang and Li, 2005).

This study aims to bridge this gap by offering a comprehensive review of literature published in major IS and HCI journals over the past three decades. The focus is on developing an integrative understanding of the findings, thereby addressing the current dearth of a collective overview. The subsequent sections detail the framework employed for categorizing and synthesizing research articles, the research methods used for article selection, a discussion of findings from the literature survey, exploration of future research directions, and concluding remarks.

II. ANALYSIS OF IT TRAINING RESEARCH OVER THREE DECADES

Over the course of three decades, the Information Systems (IS) community, along with Human-Computer Interaction (HCI) researchers, has exhibited a shared concern for ensuring users possess proficient Information Technologies (IT) skills. The effectiveness of human-computer interaction (HCI) relies heavily on users' adeptness in utilizing IT. Despite commendable efforts by IS researchers in the past thirty years to optimize methods for cultivating IT skills, the evolving IT landscape poses challenges for organizations in maintaining employee training and adapting to skill updates.

This comprehensive review delves into training research published in major IS and HCI journals over the past three decades. The objective is to consolidate findings, provide an integrative understanding of IT training research, and propose directions for future exploration.

The analysis uncovers that while IS research on training has made consistent strides in advancing knowledge about various IT training methods and cognitive learning processes, significant gaps persist. The predominant focus on the training program itself has resulted in insufficient attention to pre and post-program activities. The use of a limited set of theoretical foundations and a concentration on specific topics and single-user systems, rather than holistic enterprise systems, represent further shortcomings. Critical aspects such as enhancing user motivation before training, ensuring the transfer of training skills to the workplace, evaluating training effectiveness, and supporting continued user learning post-training have been inadequately addressed.

III. IDENTIFICATION OF RESEARCH OPPORTUNITIES

Addressing the identified gaps, this study sheds light on various research opportunities by exploring less-explored theories. Researchers are encouraged to delve into these opportunities and develop innovative methods to facilitate employee learning through emerging channels such as e-learning and social media. The evolving nature of technology and the increasing complexity of organizational structures necessitate a proactive approach to IT training research.

IV. CONCLUSION

In conclusion, this exhaustive review underscores the critical role of IT training in enhancing human-computer interaction and ensuring the effective utilization of Information Technologies. While IS research has made significant progress, there exist notable gaps that require immediate attention. The study provides a comprehensive overview of IT training research, aiming to bridge the existing gap in synthesizing disparate findings.

Moving forward, researchers are urged to explore the identified research opportunities, delving into less-explored theories to address the evolving challenges in the IT training landscape. The integration of HCI perspectives and a holistic approach to IT training, encompassing pre and post-program activities, are essential for creating effective strategies in an ever-changing technological environment.

This review serves as a foundational resource for future research endeavors, emphasizing the need for a collaborative effort between IS and HCI researchers to develop robust frameworks for IT training programs. As organizations continue to invest in technology-based training, the findings of this review provide valuable insights for shaping the future of IT training research and practice.

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