

Chapter 10

Steering Through Digital Transformation: Collective Technology Adoption in Educational Institutional Culture

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ABSTRACT

This chapter investigates technology adoption dynamics within educational institutions, highlighting institutional culture's influence on teachers' adoption behaviors. Employing a non-homogeneous hidden Markov model, it captures evolving individual-institutional interactions, framing the adoption process as transitions influenced by cultural and situational factors. Two case studies illustrate how external pressures shape collective and individual technology adoption. The first examines an e-textbook adoption's cultural dynamics, revealing impact on the underlying adop-

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tion culture. The second dissects pandemic-era teachers' technology use, assessing behavioral controls' effects on adoption intentions and behaviors across groups. Disentangling organizational and individual impacts, this guides effective integration, addresses divides, supports sustainable transformation in evolving settings.

INTRODUCTION

In the rapidly evolving field of educational technology, understanding the dynamics of technology adoption within educational institutions is paramount. This chapter explores the multifaceted influence of institutional culture on teachers' technology adoption, highlighting how both individual characteristics and broader organizational factors shape these dynamics. Recent studies have underscored the complexity of technology adoption, showing it to be influenced by a variety of factors including subjective norms, school resources, professional identity, and teachers' attitudes towards technology (Bin et al., 2020; Islam et al., 2019; Lai & Jin, 2021; Scherer & Teo, 2019). Given the inconsistencies found in previous applications of models like the Technology Acceptance Model across different cultural settings (Huang et al., 2019), this chapter introduces a dynamic modeling approach using the NHMM, which incorporates theories of dynamic behavior to capture the evolving interactions between individual and institutional factors over time. This method allows us to model the technology adoption process not just as a static decision but as a series of transitions influenced by evolving cultural and situational factors. The global COVID-19 pandemic has further complicated the landscape, forcing a shift to online learning and thereby intensifying the need for effective technology adoption. This unprecedented situation has highlighted the digital divide and brought to the fore the critical role of institutional support and culture in facilitating or hindering the adoption of technology in education. By exploring these dynamics, this chapter aims to provide insights into how educational institutions can better support teachers in integrating technology into their teaching practices, ultimately enhancing the learning experience for students. Through a detailed analysis of teachers' interactions with technology over time, this chapter contributes to a deeper understanding of the ongoing digital transformation in education.

The structure of this chapter is organized as follows: Initially, the background section delineates the motivation behind and applications of dynamic models within educational contexts. This is followed by the model development section, which details the model's definition and theoretical underpinnings. The chapter then explores two case studies that illustrate the effectiveness of dynamic modeling in capturing the intricate transformations in education, encompassing both internal factors, such as teacher beliefs, and external influences, including the impacts of the epidemic.

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