

Chapter 9

Users' Perceptions of Wireless Networks Usage

Arleen Saluja

Illinois State University, USA

Pruthikrai Mahatanankoon

Illinois State University, USA

Tibor Gyires

Illinois State University, USA

ABSTRACT

Wireless networks provide the most convenient way to access the Internet. This paper determines how the preliminary and advanced knowledge of wireless networks affect users' perception and usage. Based on their knowledge, users develop certain emotional responses, which could affect their wireless network usage. This study identifies the effect of these emotional responses on users' degree of use of wireless networks. Using data collected from 143 respondents, regression analyses reveal that wireless network usage is affected less by advanced wireless network knowledge and more by preliminary knowledge. The findings also show that the degree of usage depends on users' ability to understand basic wireless network functionality and security. To motivate wireless usage, developers and designers of future wireless technologies do not need to overwhelm users with technical detail.

INTRODUCTION

As wireless-enabled devices become easily accessible to users, wireless researchers are searching for ways to understand users and their usage. Papers published in the field of wireless networks have pointed to this research direction by examining maintenance issues involved in managing

campus wide wireless networks (Bennington & Bartel, 1997), user mobility in a metropolitan area network (Tang & Baker, 1999), user behavior affecting network performance in a public wireless local area network (Balachandran, Voelker, Bahl, & Rangan, 2002). With such widespread proliferation, Wi-Fi technologies are at the forefront of wireless network research and will continue to supplement traditional wired local area networks for flexibility, convenience, and mobility.

DOI: 10.4018/978-1-4666-0050-8.ch009

One of the fastest growing wireless implementers is among university campuses (Kotz & Essien, 2002). Steen (2001) discovered in a survey that the use of laptops and mobile devices has increased among students, owing to easily available campus-wide wireless networks. As Wi-Fi technology gains acceptance from the majority of college students, observing users' behaviors provided an opportunity to extend the scope of wireless research into social cognitive perspective. Applying Bandura's Social Cognitive Theory (1986), *the objective of this study* is to understand how the technological aspects of wireless networks affect users' emotional reactions which lead to wireless usage. Although earlier research (Compeau & Higgins, 1995b; Compeau, Higgins & Huff, 1999) has applied this psychological model to study how students' knowledge about a computer technology affects their performance, students' emotional reactions (i.e., anxiety and affect) while using wireless networks have not been fully examined. By focusing on Wi-Fi usage among college students, we can identify the emotional reactions of the students while using wireless network and the effect of these emotional responses on their usage.

This study anticipates being helpful to the wireless network training designers by helping them determine how students react while using wireless networks. Hence, this paper seeks to answer two questions:

1. *Does the users' knowledge about wireless networks have an effect on their emotional responses while using wireless networks?*
2. *Do the users' emotional responses while using wireless networks have an effect on their wireless network usage?*

To address the research questions, an empirical study involving qualitative and quantitative methods of data collection was conducted. The statistical software package SPSS 16.0 was used to analyze the data collected from the users.

THEORETICAL BACKGROUND

Social cognitive theory (SCT) integrates an individual's cognitive responses, behaviors, and environment to explain a specific behavioral outcome (Bandura, 1977). Bandura (1986) addresses the principle of triadic reciprocity in which *person*, *environment* and *behaviors* assert an integrated, predictive role in determining the behavioral outcome. In other words, SCT articulates that an individual gets influenced by the environment while monitoring a certain behavior and develops perceptions of their ability to perform that behavior.

Central to the development of the perception to successfully perform an activity is self-efficacy (Bandura, 1986). Bandura (1986) postulates self-efficacy as: "People's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura, 1986, p. 391). Self-efficacy, therefore, refers to "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations" (Bandura, 1995, p. 2). SCT and self-efficacy have been applied to information systems research to investigate computer-related training and adoption (Compeau & Higgins, 1995a; Compeau & Higgins, 1995b; Compeau, Higgins, & Huff, 1999).

The Triadic Reciprocity—person, environment, behavior—can be applied to the context of wireless network usage. *Person* is related to cognitive and learning abilities of a wireless user. *Environment* refers to the social pressure in which a user performs a specific wireless activity. *Behavior* refers to user's reaction while engaging in the activity, or user's emotional responses while using wireless networks. For example, while engaging in wireless network setup, a user can develop a perception (or self-efficacy) of his/her ability to operate a wireless network. This perception can

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