

## ORIGINAL ARTICLE

# Application of the Unified Theory of Acceptance and Use of Technology in Predicting the Acceptance and Use of Medical Technologies Among Medical Students

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## ABSTRACT

This study purposed to investigate the application of the unified theory of acceptance and use of technology in predicting of the acceptance and use of technology of medical technologies among medical students at the Islamic Azad University of Kerman. The research method was descriptive-correlational. The statistical population was all medical school students, 206 of whom were selected through two-stage cluster sampling by field and responded to the questions of the unified Theory of Acceptance and Use of Technology questionnaire used in the study by Hsu et al. (2021) and Chang et al. (2021). The data were analyzed using path analysis. The results showed that the direct effect of facilitating conditions and behavioral intention to use medical technologies on the actual usage of medical technologies is positive and significant. The direct effect of performance expectancy, effort expectancy, and social influence of using medical technologies on behavioral intention to use medical technologies is positive and significant, but the direct effect of facilitating conditions on behavioral intention to use medical technologies was not significant. Mediation results showed that behavioral intention to use medical technologies has a positive and significant mediating role in the relationship between performance expectations and actual use and in the relationship between effort expectations and actual use of medical technologies, But, it does not play a significant mediating role in the relationship between social impact and actual use, and in the relationship between facilitating conditions and actual use of medical technologies. Therefore, it can be said that among medical students, performance expectations and effort expectations regarding the use of medical technologies are more important factors in the acceptance and use of medical technologies than social influence and facilitating conditions.

## KEY WORDS

The Unified Theory of Acceptance and Use of Technology, Behavioral Intention to Use Technology, Actual Usage of Technology.



## Introduction

The unified theory of acceptance and use of technology (UTAUT) framework assumes that performance expectancy, effort expectancy, social influence, and facilitating conditions influence individuals' behavioral intentions to use a technology (Venkatesh et al., 2003). According to Venkatesh et al. (2003), behavioral intention is described as an individual's likelihood to engage in a particular behavior. In other words, it is an individual's subjective probability that he or she will perform the intended behavior. In educational settings, behavioral intention is conceptualized as the subjective probability that students will use e-learning as part of their learning. Yakubu and Dasuki (2019) argue that behavioral intention measures the strength of an individual's commitment to perform a particular behavior. Erasmus et al. (2015) stated in the integrated theory of technology acceptance and use and the technology acceptance model that behavioral intention ensures the use of various technologies by the application, because the user's behavioral intention predicts the performance of an intentional action such as deciding to accept and use an information system. It has also been found that the behavioral intention of the application accurately predicts the actual use of a computer information system or technology.

## Method

The present study was a descriptive correlational study. In this correlational study, the aim was to investigate the structural relationships between the constructs of the unified theory of acceptance and use of technology (UTAUT) of Venkatesh et al. (2003) among medical students. The statistical population of the study included 347 students in nursing, midwifery, and doctoral programs at the Faculty of Medical Sciences, Islamic Azad University, Kerman Branch, of whom 206 were selected using a two-stage cluster sampling method based on their field of study. To select the sample, first two entries were randomly selected from different medical fields, and then 9 classes were selected from the selected entries, and then the questionnaire was distributed among the students of the selected classes. Of the 206 selected, 166 (80.6%) were female students and 40 (19.4%) were male students. Also, 98 (47.57%) were studying in nursing, 73 (35.43%) in midwifery, and 35 (17%) in doctoral programs.

A 25-item questionnaire was used to collect data on the constructs of the unified theory of acceptance and use of technology (UTAUT) in the medical field, the questions of which were adapted from the study of Hsu et al. (2021) and the study of Li et al. (2023). The constructs examined included performance expectancy (6 items), effort expectancy (4 items), social influence (4 items), facilitating conditions (5 items), behavioral intention (4 items), and actual use (2 items), which were measured on a 5-point Likert scale from "never = 1" to "definitely = 5". To examine the construct validity, exploratory factor analysis using principal components and varimax rotation was used. The results showed the existence of 6 components that explained a total of 63.25% of the variance. The reliability results showed that the reliability of performance expectancy (0.86), effort expectancy (0.78), social influence (0.73), facilitating conditions (0.72), behavioral intention (0.75), and actual use (0.85) was estimated, all of which are desirable. Path analysis method with AMOS software was used to analyze the relationships between variables.

## Results

The results showed that a very good fit of the model in the population. The results showed that the direct effect of facilitating conditions on medical technologies, and the direct effect of behavioral intention to use medical technologies on the actual use of medical technologies was positive and significant. The results showed that the direct effect of performance expectancy regarding medical technologies, effort expectancy regarding medical technologies, and social

influence regarding medical technologies on behavioral intention to use medical technologies was positive and significant, but the direct effect of facilitating conditions regarding medical technologies on behavioral intention to use medical technologies was not significant.

The results showed that the behavioral intention to use medical technologies had a positive and significant mediating role in the relationship between performance expectancy about medical technologies and the actual use of medical technologies by medical students. The results showed that the behavioral intention to use medical technologies had a positive and significant mediating role in the relationship between effort expectancy about medical technologies and the actual use of medical technologies by medical students. The results showed that the behavioral intention to use medical technologies did not play a significant mediating role in the relationship between the effort expectancy about medical technologies and the actual use of medical technologies by medical students. The results showed that the behavioral intention to use medical technologies did not play a significant mediating role in the relationship between the effort expectancy about medical technologies and the actual use of medical technologies by medical students.

## **Discussion and conclusion**

The results showed that positive perceptions of medical technology achievements ultimately lead to an intention to accept it, while negative perceptions of medical technology achievements will lead to an intention not to accept it as part of their learning activities. The results also showed that the more students perceive that the medical technology system is easy and requires minimal effort to work with, the more inclined they will be to accept medical technology as part of their learning tools. Other results showed that social influence is a determining factor for behavioral intention to use medical technologies. Some students with high acceptance of new things often have higher expectations for the application of emerging technologies and pay more attention to innovation and technological development. They are usually eager to be ahead of others and be the first adopters of new products with higher behavioral intention to use medical technologies. However, in the process of popularization and use of technology, the leadership role of professors should be fully considered, which can further strengthen the impact of social influences and facilitating conditions. Facilitating conditions were considered as access to an appropriate learning environment and infrastructure at the university that could enhance the use of the desired technology. These conditions included access to the knowledge and skills needed to work with technology as well as an environment that stimulated and supported students' willingness to use technology (i.e., medical technologies). Hence, the results indicate that facilitating conditions are a determinant of behavioral intention to use technologies. Unlike previous studies, facilitating conditions in this study did not affect actual usage.

Generally, based on the UTAUT model, this study investigated the factors affecting the acceptance of medical technologies among students through a questionnaire, but there are still some limitations. First, this study only examined the relationships between constructs without considering possible moderating variables such as gender, age, and experience. Second, the study used a cross-sectional study to identify factors that influence the acceptance and use of technology among medical students, and future studies can use longitudinal studies to examine the acceptance and use of technology among medical students over time.

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## **Authors' Contribution**

The sole author was responsible for the study's conceptualization, methodology, data collection, analysis, writing, and final approval of the manuscript.

### **Conflict of Interest**

The author declares no conflict of interest regarding the publication of this article.

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