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Technology acceptance model (TAM) on the drivers iPad used by university academicians: a conceptual model

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Abstract

This research paper suggests a conceptual model for the academic staff adoption of iPad at university. With the enhancement of technology, knowledge can be developed more efficiently and effectively for the Teaching and Learning (T&L) process. iPad has become an important technology tool in the advancement of education, particularly in classroom instruction. Therefore, the purpose of this study is to investigate the dimensions of the drivers of iPad used by university academicians based on the technology acceptance model (TAM). The methodology used for this study, was to extract the critical factors from TAM. The five critical factors that supported the TAM theory are perceived ease of use (PEOU), perceived usefulness (PU), behavioral intention (BI), attitude (ATT) and frequency of actual use of iPad (AU). All these critical factors determined and validated by supported preceding articles and represent as the proposed dimensions for the conceptual model. Next, the hypotheses developed for each association among the critical factors. The findings drawn from the developed hypotheses generally lead to the development of a conceptual model. The limitation of this study is just to provide the conceptual notion; thus, this model could extend to the empirical analysis in the future.

Keywords:

Technology acceptance model, Academicians, iPad, Conceptual model.

Introduction

Wireless communication network technology and intelligent mobile devices have improved quickly in recent years (Chen and Chen, 2022). The product has evolved from initial personal digital assistants (PDAs) to smartphones. Apple's iPad series has consistently led the personal computer (PC) market. Since its debut, the iPad, a mobile tablet that runs Apple's iOS operating system, has sold over 270 million copies worldwide (Chen and Chen, 2022). Recording, photography, music playback, and Internet-related operations such as online surfing and email are among the basic iPad functionalities. Downloading and installing applications (Apps) can provide access to extra features like games, reference books, Global Positioning System (GPS) navigation, and social networks. Apps for iPad can be downloaded and installed from the Apps store based on their specific functional requirements. The iPad is a light, portable device that incorporates essential computer operations as well as a multi-touch panel to replace traditional keyboard and mouse functions, which prompted the use of iPad among academician.

Moreover, iPad tablets are frequently employed in a wide range of industries. The use of iPad has even enhanced or changed the structure and development of numerous enterprises, such as publishing, software, services, catering, manufacturing, construction, and education. Aside from their widespread use in the industry, the incorporation of iPads into classrooms and learning institutions has recently gained popularity (Zogheib, 2019). The use of iPads by university academicians has continuously expanded since the iPad's release in 2010, with conservative estimates placing total iPad sales based on Apple's quarterly financial report for June 2022 at 7.15 billion worldwide (Laricchia, 2022). Because of the advancement of digital tools such as the iPad, many schools now recognize them as viable options for providing their students with a learning resource that matches today's standards. A tablet is chosen as a substitute device over a laptop Teaching and Learning (T&L) among academicians due to the latest technology developed. The iPad is regarded as the best-suited gadget for education, with over 75 thousand educational apps accessible, not to mention its lightweight and extended battery life (Lestari and Indrasari, 2019). It is also the most secure and simple to manage on a learning institutions-wide scale. The iPad's portability, accessibility, interactivity, and power supply efficiency have been recognized as an effective T&L tool that contributes to having a good impact on education. As a result, due to its comprehensive features that enable academicians to deliver information in such a way that promotes deeper learning to their students, it may benefit students in the knowledge-acquisition process by providing access to the best-suited learning materials (e.g., video, articles, podcast) as well as the knowledge-storage process (e.g., note-taking, highlighting, mind-mapping).

Coronavirus disease (COVID-19) has profoundly changed people's lifestyles all over the world. All learning institutions were required to close and convert physical learning to online learning to improve the safety of students and lecturers. The application of digital technologies has been effective in decreasing illness spread and increasing resistance to the emerging COVID-19 (Brem, Viardot and Nylund, 2021; Kumar, Gupta and Srivastava, 2020; Steen and Brandsen, 2020; Ting et al., 2020).During the pandemic, technology gadgets substantially aided and facilitated our society, such as online shopping, contactless payments, remote work, and online learning. Hence, the internet has been personally vital to an individual. The iPad is viewed as the device to use compared to the iPhone (smartphone), as it meets all those demands even better (Chen, 2020).

TAM is used in this study to determine the variables influencing university academicians' acceptance of technological items. The TAM comprises perceived usefulness, perceived ease of use, attitude, behavioral intention, and frequency of actual usage. Perceived usefulness and perceived ease of use are the two core components to explain the users' perceived acceptance of technology (Hussein and Hilmi, 2022). This study is to examine the technological item used, particularly emphasis on the iPad as a new electronic technology product by academicians in university, underpinned by the TAM perspective. As a result, this study aims to explore the dimensions of iPad drivers utilized by university academics based on the TAM. The use of a mobile computing (iPad) in education has an impact on the effectiveness and efficiency of T&L. Although Apple is not thefirst company to suggest the idea of a mobile computer, it has been a great success in bringingit to market, boosting its global popularity and transforming the information technology (IT) industry, setting an unprecedented sales record, and offering users an alternative to traditionaldesktop PCs and notebooks in terms of application methods and user experience. The questionsraised in this study are (1) What are the factors influence university academicians to use iPad mobile devices as a teaching tool? and (2) What are the associations among the TAM elementstowards the use of iPad mobile devices as a teaching tool?

Research underpinning theory

The technology acceptance model (TAM) is a trustworthy and valuable paradigm for understanding the factors that affect users' desire to utilize technology in the context of education (Teo, 2012). TAM relates to the belief that consumers' attitude toward technology significantly impacts its acceptance (Davis, Bagozzi and Warshaw, 1989). Consumers would only utilize the technologyif it met their needs. The TAM model is popular due to its simplicity and clarity (King and He, 2006). TAM's goal is to investigate why users' attitudes and beliefs influence their adoption orrejection of information technology (IT) and explain the factors that influence IT adoption andutilization.

TAM was developed by Davis (1986). It was taken from the study of social psychology's theory of reasoned action (TRA), which defines behavior in the context of intention. Attitude and subjective standards are two elements that influence behavioral intention. However, a third factor, perceived behavioral control, also plays a role. TRA was designed to describe generic human behavior. On the other hand, TAM explicitly illustrates the critical definitions of technology acceptance that are common and capable of describing the population among users and user behavior across a wide range of end-user computing technologies (Davis, Bagozzi and Warshaw, 1989).

According to TAM, adopting new technology will advance if people have favorable opinions regarding the perceived usefulness (PU) and perceived ease of use (PEOU) measures. PEOU and PU are the two essential determinants in determining how well users adopt technology as they affect academicians' attitudes, intentions, and frequency of use towards an iPad. TAM has been widely applied to analyze user acceptance in various studies, including Internet banking (Vukovic, Pivac and Kundid, 2019), electronic commerce (Fedorko, Bacik and Gavurova, 2018), digital bagtag (Apinantasap and Gerdsri, 2022), online learning (Lazim, Ismail and Tazilah, 2021) along with others.

Although TAM only contains two primary variables, several authors have expanded and tested the model with additional variables to gain a correct solution to what motivates university academicians to use an iPad. According to (Davis, Bagozzi and Warshaw, 1989). PU and PEOU are essential dimensions.However, for example, Lestari and Indrasari(2019) analyzed the iPad used by teachers in theclassroom in Indonesia by employing a multiple linear regression method. From the result, theydid not agree that PU and PEOU play a significant influence in predicting technology adoption.It may be caused by the concept used in Lestari and Indrasari's study does not correspond toDavis' perceived usefulness. The majority of teachers agreed that using iPads in the classroomwill benefit both students and teachers, but this belief should be backed up by regular iPad use. Besides, they have included efficacy as a variable in the model and discovered that it significantly affects the use of iPad as teaching tools.

Jo Ann and Md Noor (2022) have studied the adoption of one-stop e-commerce platforms for baby product purchases. They have included dimensions such as trust, perceived benefits, and perceived risk. According to the research, trust and perceived benefits positively influence online purchasing decisions for baby products. Thus, other variables should be considered in TAM as there are many restrictions to the intention to act. Furthermore, this study found that the PU of technology plays a more substantial impact and is the most predictive factor in purchasing infant products on a one-stop e-commerce platform. According to Hanjaya Kenny and Gunawan (2019), the simplicity of use of technology provides the finest online shoppingexperience and substantially influences purchase intention.

Adopting any technology by its users is critical to its successful implementation. Interestingly, the features of technology (iPad features) play a significant effect in predicting whether individuals in an activity would use it, as well as the frequency with which the technology is used. As a result, understanding the user's impression of iPad adoption could support the continued growth of the iPad's implementation. In truth, the iPad development effort will only succeed if people participate and use it. As a result, user acceptance towards iPad is a fundamental component of the iPad's implementation and evolution. Recognizing the elements that can influence user acceptance would be beneficial in determining the path of future development for academicians.

iPad Application for Teaching and Learning (T&L)

In the field of education, the iPad is the most popular device for T&L especially in higher education institutions. Various advantages explain why the iPad is chosen over other devices compared to PCs, such as desktops, laptops, and smartphones. The critical difference between the iPad and other smartphones is the greater screen size, longer battery life, and superior performance. Furthermore, the iPad outperforms smartphones in terms of quality, memory capacity, and instructional value. The iPad is then pitted against PCs and laptops. iPads are preferred by educators because they are more secure, adaptable, and simple to use than PCs or laptops.

The iPad is used in the classroom because it is interactive, adaptable, cost-effective, and a terrific communication tool. Educators believe that the iPad can help increase students' academic engagement, motivation, and achievement inside and outside the classroom. The iPad can conduct various activities, such as writing and reading, which might help compete with school-related activities. Also, this technology is preferred by lecturers because it allows them to involve students in their learning in a variety of creative ways, including video and audio functionalities. Teachers stated that the iPads aided them in promoting independent learning, more readily differentiating learning for unique student needs, and easily sharing resources with students and one another. Students can practice activities at various levels independently using various iPad apps. According to new research published in 2016, iPads enable teachers to "personalize instruction for each child" (Tynan-Wood, 2016). If a student ishaving trouble, educators can use the iPad to reinforce concepts (via games, focused reading,or applications), and if another student needs to proceed more quickly, the student can look for pre-list assignments or notes prepared by the lectures, or can get extra practice from the teachers with just one touch of a button without photocopying. Furthermore, iPads can augment teacher instruction by allowing students to learn from the programs on their iPad rather than listening to their teacher for the whole session, and pupils will not become bored or drowsy as readily.

Development of the Conceptual Model

Proposed Conceptual Model

This conceptual model suggests few associations between variables derived from TAM. Based on the conceptual framework in Figure 1, the following six hypotheses have been developed according to the literature review and justifications. In this study, the null hypotheses were defined as having no significant impact or influence among five dimensions (perceived usefulness, perceived ease of use, attitude, behavioral intention, and frequency of actual use of an iPad).

a) Perceived Usefulness (PU) has significantly impact on Attitude (ATT) and Behavioral Intention (BI)

The term "perceived usefulness" describes how people think using the new technology would help them perform better at work (Davis, Bagozzi and Warshaw, 1989). Many researchers believe that PU is theprimary enabler of using technology (Ozkale and Koc, 2020; Zheng and Li, 2020). In other terms, perceived usefulness expresses users' expectations for the system as a tool for work or study. Potential users, for instance, claim that the iPad can improveproductivity and effectiveness in the classroom or at work while reducing work time and assisting with the study. Thus, potential users will have a more favorable attitude toward theiPad if they view it as more useful (Liu et al.,2022a,b,2020,2021). Besides, using the iPad is efficient if it directly impacts the user's behavior (Diop, Zhao and Duy, 2019). It can help them to solvethe primary purpose of using the iPad. Therefore, perceived usefulness will have a favorableeffect on the intention to utilize an iPad.

As a result, the following alternative hypothesis statements were created.
H1 : Perceived Usefulness has a positive effect on attitude towards using iPad

H2 : Perceived Usefulness has a positive effect on behavioral intention towards using iPad

b) Perceived Ease of Use (PEOU) has significantly impact on Perceived Usefulness(PU) and Attitude (ATT)

The degree to which a person expects finding a specific technology easy to use is referred to as the system's perceived ease of use (PEOU), according to (Davis, Bagozzi and Warshaw, 1989). It expresses howmuch a consumer believes using an iPad will be effortless. For example, when the system or technology is simple to operate and understand, users will be more confident in their capability of mastering the system or technology and willing to accept using it (Chen and Chen, 2022). However, if it is too challenging or necessitates extensive mental learning, itwill cause the rejection of users. Users' attitudes towards the system are better when they think the innovative technology is easier to understand. Hence, it can conclude that perceivedease of use affects perceived usefulness positively (Dhingra and Mudgal,2019; Lestari and Indrasari,2019). Therefore, the attitude toward utilizing the iPad increases as the perceived system ease of use increases. It is easier to learn, and the most recent products with up to-date technology typically provides users with a high level of ease of use because of the accessibility of critical functions with only a few taps away (Jan et al., 2019).

As a result, the following alternative hypothesis statements were created.
H3 : Perceived ease of use has a positive effect on perceived usefulness of iPad
H4 : Perceived ease of use has a positive effect on attitude towards using iPad

c) Attitude (ATT) has significantly impact on Behavioral Intention (BI)

People's intentions to use a specific item are influenced by their attitude (Jan et al., 2019). A consumer with a positive attitude towards using iPad tends to accept the iPad technology positively. Bhattacherjee and Sanford (2009) show that attitude results in an excellent intention to accept a new environment. According to Muhaimin et al. (2019), the intention to use technology increased with the amount of a particular behavior related to its use.

As a result, the following alternative hypothesis statement was created.
H5 : Attitude towards using has a positive effect on behavioral intention to use iPad

d) Behavioral Intention (BI) has significantly impact on Frequency of actual use an iPad (AU)

Behavioral intention is the motivational factor influencing whether a person wants to execute the behavior in the future. From an individual's intention, it will be possible to predict how they will utilize technology (To and Tang, 2018). If users believe that using all of the functions and real-worth services offered by this cutting-edge technology will increase the efficacy of their study or work, they are more inclined to do so. As a result, users will use the device more frequently and accept it as a technical advancement (Chen and Chen, 2022). In other words, behavioral intention to adopt a technology (such as the iPad) will result in frequent usage.

As a result, the following alternative hypothesis statement was created.

H6 : Behavioral intention to use iPad has a positive effect on frequency of actual use an iPad

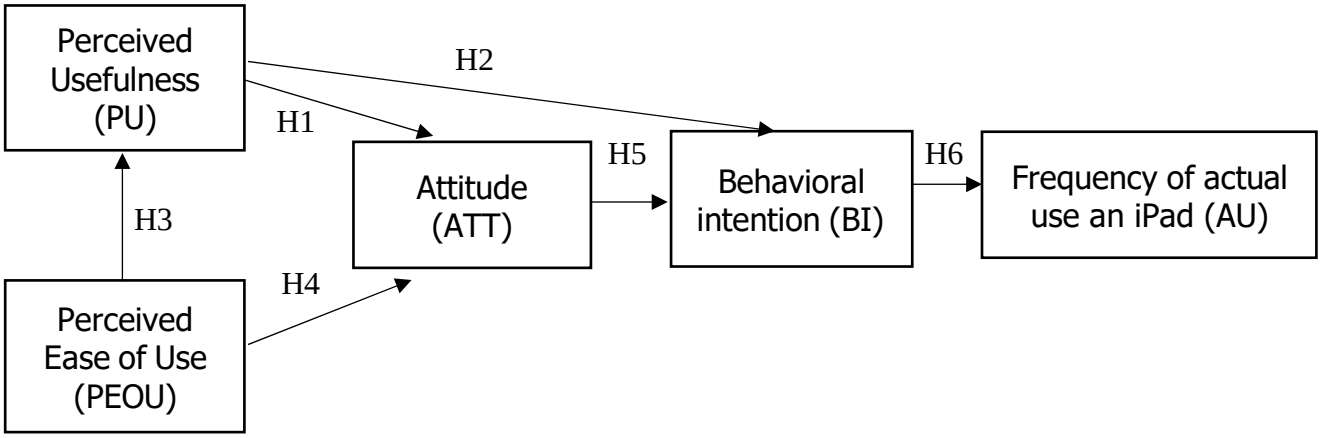

Figure 1: Proposed Conceptual Model based on TAM

Discussion and Concluding Remarks

The iPad's interactive features and visual appeal, together with those of other tablet computers, may offer students a variety of chances to learn about various knowledge. When used as part of an active learning environment in the classroom, iPads may serve as a medium by which university academicians might use. Academicians should look into how applications can be used and assessed both within and outside the classroom to improve student involvement in the classroom as mobile technologies are increasingly frequently accepted by students. Finally, methods for knowledge or skill assessments should be considered by application developers in case they are included in future recommendations for effective iPad integration in the classroom. The association integrated between the TAM's elements, described the direction of relationship between variables involved. However, there is no solid evidence if not being tested empirically. Hence, future research using partial least square based structural equation modeling (PLS-SEM) or covariance based structural equation modeling (CB-SEM) could be applied for an empirical study in order to validate this proposed conceptual model.

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