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USEFULNESS OF TECHNOLOGY ACCEPTANCE MODEL AND BEHAVIORAL INTENTIONS OF E-LEARNING TECHNOLOGIES FOR TEACHING AND LEARNING OF BUSINESS EDUCATION PROGRAMME IN COLLEGES OF EDUCATION

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Abstract

This study investigates the relevance of the Technology Acceptance Model (TAM) and behavioral intentions in the adoption of e-learning technologies for teaching and learning in Business Education programmes at Colleges of Education. This research explores the existing literature on TAM, highlighting its role in explaining how perceived ease of use and usefulness influence technology adoption. This study also examines the nature and objectives of Business Education, emphasizing how TAM applies to instructional activities by using mobile devices. Findings suggest that the evolving information landscape necessitates the effective integration of modern technology, which enhances access to updated learning resources and promotes educational development. This study concludes that lecturers must acquire the necessary competences to support students in using ICT tools for academic purposes. Regular training sessions, such as workshops and seminars, should be conducted to build lecturers' capacity for integrating pedagogical ICT integration, including raising awareness of its instructional benefits. Moreover, this study underscores that the impact of ICT on student learning is closely tied to lecturers' attitudes and proficiency. Since behavioral intention significantly affects actual ICT usage, fostering positive attitudes and digital literacy among lecturers is essential. These strategies are expected to improve teaching methodologies, promote effective learning, and align with the demands of 21st-century education.

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Introduction

Globally, many educational institutions are transitioning from traditional, face-to-face instruction to online learning formats. Advances in computer technology and internet connectivity have proven effective in motivating, engaging, and shaping students' learning behaviors. E-learning is a powerful communication tool that enhances collaboration between educators and learners (Kumar, Nayak & Bhinder, 2021). With the rapid evolution of education into digital spaces, supported by technological advancements, e-learning has become increasingly prominent (Afolabi, 2015). This transformation is influenced by various disciplines, including artificial intelligence, cognitive psychology, computer science, library and information science, and the broader field of education (Kumar et al., 2021). The COVID-19 pandemic further accelerated the integration of digital technology into education (Teräs, Suoranta, Teräs, & Curcher, 2020).

Over time, research literature has demonstrated that theoretical frameworks and models underpin virtually all academic disciplines and practices. These frameworks are essential tools for validating concepts because, they help evaluate the effectiveness of various phenomena compare to established or hypothesized assumptions (Müller & Urbach, 2017). In academic research, a study lacking theoretical grounding is often perceived as lacking depth and academic rigor. As a result, anchoring research efforts on sound theoretical foundations has become a widely accepted academic norm (Müller & Urbach, 2017).

In the domain of Information and Communication Technology (ICT), several theories and models have emerged to explain technology adoption and use. While some focus on user behavior during the design of ICT systems, others aim to understand and predict technology acceptance. Among these, the Technology Acceptance Model (TAM), developed by Davis in 1986, has become one of the most widely adopted frameworks. TAM seeks to explain the relationship between individuals' acceptance of technology and their actual use of it. However, the degree to which TAM accurately reflects real-world usage patterns remains a point of scholarly inquiry.

Concept of Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Davis (1986), is an information systems theory designed to explain how users accept and use a particular technology. The model centers on two primary constructs, acceptance and usage and it is specifically aims to predict the likelihood that an information system will be accepted and employed by its intended users.

The original goal of TAM was to illuminate the processes influencing technology adoption, offering both theoretical insights and practical recommendations for implementation. To develop this framework, Davis (1989, 1993) examined the mediating mechanisms between the external characteristics of an information system and its actual use. Rooted in the Theory of Reasoned Action, TAM introduced a psychological dimension that was previously absent in the field of Information Systems.

TAM proposes that when individuals are introduced to a new technology, their decision to adopt and use it is largely influenced by two key perceptions:

- **Perceived Usefulness (PU):** The degree to which a person believes that the system will enhance their performance.
- **Perceived Ease of Use (PEU):** The degree to which a person believes that the system will be free of effort.

The model incorporates behavioral elements, positing that once an individual forms an intention to act, they typically follow through, assuming no external constraints. However, the adoption of complex technologies, such

as computers, often introduces uncertainty, causing individuals to develop attitudes and intentions toward usage even before trying the technology.

TAM further accounts for both social influences (such as subjective norms, perceived voluntariness, and social image) and cognitive factors (like job relevance, output quality, and demonstrability of results). The model emphasizes that behavioral intention, which is shaped by attitude and perceived utility, ultimately determines actual system use. According to Davis (1993), although attitude plays a significant role, performance expectations also influence system use, suggesting that even reluctant users may adopt a system if it enhances work efficiency. Additionally, perceived ease of use affects attitudes through two key pathways: self-efficacy and instrumentality. Bandura (1997) argued that simpler systems boost users' confidence, while Lepper (1985) observed that user-friendly tools promote a sense of control, thereby enhancing intrinsic motivation. A system that requires minimal effort allows users to reallocate their energy to other tasks, to further improve performance. Empirical research has shown that perceived usefulness often has a stronger impact on the intention to use than perceived ease of use. The diagram below (Figure 1) illustrates the core components and relationships in the TAM:

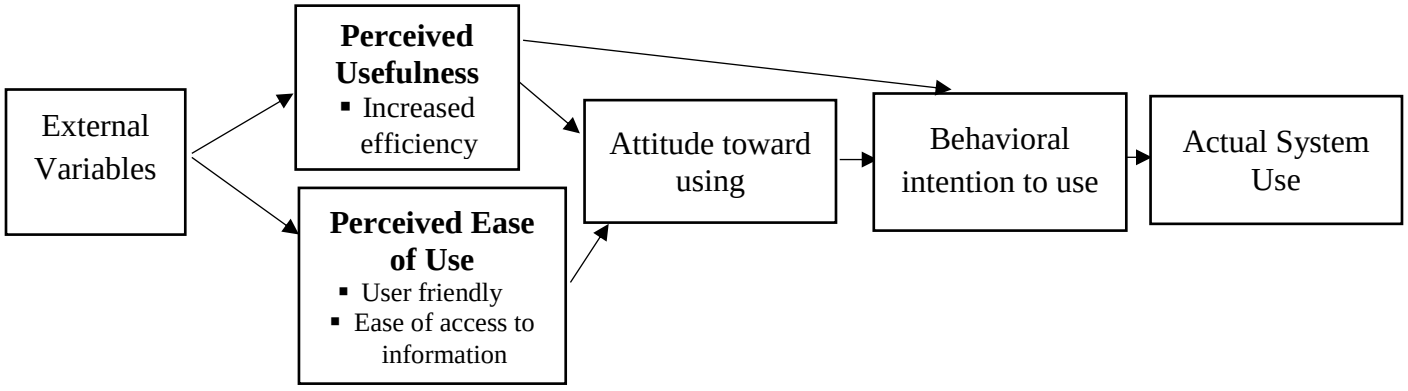

Figure 1: Technology acceptance model
Source: Fred Davis (1989)

External Variables

In the context of the Technology Acceptance Model (TAM), external variables refer to various external factors that can shape user beliefs about a system's usefulness and ease of use. These may include the design and characteristics of the system, the surrounding environment, user habits, and convenience, as well as other contextual influences (Kuo, Huang & Hsu, 2020). These factors serve as antecedents that indirectly or directly shape cognitive evaluations of technology.

Research has identified numerous elements that influence how individuals embrace technology. For example, in e-learning environments, self-efficacy is a user's belief in their ability to perform a task and has been shown to be a significant determinant of knowledge sharing (Hosseini, Bathaei & Mohammadzadeh, 2014). In TAM, these external influences significantly contribute to how technology is perceived and adopted.

According to Hong and Yu (2018), TAM presents a dynamic framework that illustrates the interaction between external variables and cognitive constructs like Perceived Usefulness (PU) and Perceived Ease of Use (PEU). These variables jointly influence an individual's attitude toward using technology and their behavioral intention to adopt it, which eventually leads to actual usage. Thus, the model captures the comprehensive process through which environmental and system-related factors shape user behavior in technology adoption.

Perceived Usefulness (PU)

Perceived Usefulness (PU) is defined as an individual's belief that using a specific technology will enhance their job performance in an organizational setting (Davis, Bagozzi & Warshaw, 1989). This perception is a critical

driver of whether a person chooses to adopt or use a technology. If users believe that a system can help them complete tasks more efficiently, accurately, or quickly, they are more inclined to adopt it.

In educational contexts, perceived usefulness is linked to both teaching and learning outcomes. Masango (2019) emphasized that educators and students tend to adopt ICT tools more readily when they believe these technologies will enhance their classroom experiences and instructional effectiveness.

In addition, PU encompasses improvements in work productivity, time management, and overall effectiveness. The extent to which users associate a tool with positive outcomes in their professional or academic responsibilities. As such, it plays a vital role in shaping users' behavioral intentions and eventual system use.

Perceived Ease of Use (PEU)

Perceived Ease of Use (PEU) refers to the degree to which an individual believes that using a particular technology will require minimal effort (Davis et al., 1989). In simpler terms, it reflects the user expectation that the system will be intuitive and uncomplicated to operate.

PEU is closely linked to perceive usefulness because, research has shown that ease of use often enhances users' perception of a system's overall value. In fact, PEU indirectly influences users' attitudes toward the technology by positively impacting their perceived usefulness (Teo, Lee & Chai, 2008). While PU has a direct effect on user attitude, PEU operates more subtly, shaping attitude through its contribution to how beneficial the system is perceived.

When a system is easy to navigate and requires little learning curve, users are more likely to develop favorable attitudes and intentions toward adopting it. Therefore, PEU not only plays a significant role in early acceptance but also in sustained usage by reducing the resistance and frustration associated with learning new tools.

Attitude toward Use (AU)

Attitude toward Use (AU) refers to an individual's overall evaluative judgment, whether positive or negative, about using a specific technology. This represents the user's predisposition to respond favorably or unfavorably to the system (Ajzen & Fishbein, 2005). This attitude is a critical determinant of the decision-making process surrounding technology adoption.

In educational settings, teachers' attitudes are especially pivotal in determining whether new technologies can be successfully integrated into teaching and learning practices. Kisanga (2016) observed that, positive attitudes toward ICT use significantly enhance the likelihood of effective implementation in classrooms.

Liaw, Huang, and Chen (2007) emphasized that regardless of how advanced or capable a technology may be, its adoption and effective use largely depend on users' willingness to engage with it. Therefore, fostering a positive attitude toward technology through awareness, exposure, and training is essential for promoting widespread and meaningful usage.

Behavioral Intention to Use (BIU)

Behavioral Intention to Use (BIU) refers to the strength of an individual's intention to perform a specific behavior, in this case, adopting and using a particular technology (Bundot, Yunos & Mohammed, 2017). Within the framework of the Technology Acceptance Model (TAM), BIU is primarily influenced by two factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEU).

While PU relates to the expected performance outcomes and PEU to the effort required, both jointly shape a person's willingness to engage with the system. Behavioral intention serves as a reliable predictor of actual technology usage, effectively bridging the gap between cognitive evaluations and user actions.

Liaw (2002) differentiated constructs by associating PU with outcome expectancy and PEU with process expectancy. Teo and Ursavaş (2012) further confirmed that these relationships are consistently observed in a wide range of educational and technological contexts.

Essentially, a user who perceives a system as beneficial and easy to use is more likely to form a strong intention to adopt it, and such intention is a key step toward actual implementation.

Actual System Use (ASU)

Actual System Use (ASU) represents the extent to which a technology is actively utilized by its intended users. The tangible outcome of the behavioral intention to use is often measured by how frequently or consistently users interact with a system (Khairani, Daud & Adnan, 2020).

In the context of the Technology Acceptance Model, behavioral intention is a strong predictor of actual use. However, this relationship is also shaped by earlier perceptions such as, perceived ease of use and usefulness. When users believe a technology is beneficial and easy to operate, they are more inclined to act on their intentions and incorporate it into their daily routines.

Nugroho, Notobroto, and Rosyanti (2021) emphasized that the degree of actual system use reflects the real impact of users' beliefs and intentions. In practical terms, frequent and purposeful use of technology validates the earlier stages of TAM and confirms successful adoption.

Concept of Business Education

According to the National Universities Commission (NUC) in its Core Curriculum and Minimum Academic Standards (CCMAS), Business Education is a professional discipline designed to equip students with the knowledge, skills, and competences necessary for employability, entrepreneurship, and teaching business-related subjects across various educational levels. It prepares learners for meaningful participation in office occupations and offers pedagogical training for business instruction, fostering both self-employment and job creation.

Business Education bridges theoretical knowledge and practical applications, encompassing areas such as accounting, office management, entrepreneurship, and marketing (NUC, 2022). The programme is tailored to meet the dynamic needs of the business world, ensuring that graduates are ready for the evolving demands of the labor market (Ezeani & Ogundola, 2016).

The key objectives outlined in the CCMAS for Business Education include the following:

- Providing hands-on training for effective performance in the office, distributive, and service sectors.
- Guiding students toward business careers that align with their interests and aptitudes.
- Enhance personal development and attitudes essential for the workplace.
- Support career placement in business and administrative environments.
- Promoting awareness of the free enterprise system and nurturing economic understanding (NUC, 2022).

As a component of vocational education in Nigerian tertiary institutions, Business Education aims to reduce unemployment by empowering individuals with practical competences. The curriculum includes subject areas such as marketing, commerce, accounting, stenography, cooperative studies, office administration, and information technology.

Offered across different educational tiers, including the three-year Nigeria Certificate in Education (NCE), Ordinary National Diploma (OND), Higher National Diploma (HND), and four-year university degrees, Business Education seeks to:

1. Introduce students to business principles early on.
2. Foster vocational interests and skills.
3. Develop interpersonal and human relation capabilities.

4. Prepare students with foundational skills for entry into the workforce.
5. Impart theoretical and practical knowledge of core business disciplines (Ezeani & Ogundola, 2016).

Furthermore, Nedum-Ogbede (2013) highlighted the role of Business Education in addressing youth unemployment by equipping graduates with relevant competences for self-sufficiency and productive engagement. Educators in this field are expected to uphold professionalism, maintain ethical standards, continuously improve their teaching practices, and remain committed to lifelong learning (Cox, 2017). A committed business educator not only embraces teaching as a career but also views it as a platform for societal transformation and personal fulfillment.

Application of a Technology Acceptance Model in the Teaching and Learning of Business Education Programme Using Mobile Devices

In recent years, both individuals and institutions have increasingly recognized the transformative power of Information and Communication Technologies (ICT) in enhancing functionality and productivity (Kandiri, 2014). As users seek more flexibility and convenience, there has been a significant shift from fixed computing technologies to mobile alternatives. This shift has led to the widespread acceptance and adoption of mobile technologies across numerous sectors, including education (Mberia, Ofafa, Muathe & Muli, 2013).

In the educational landscape, mobile technologies are now commonly used and expected by learners. Research shows that students, especially those in rural or underserved areas, are eager to leverage mobile devices for more than just communication or entertainment (Kim, Rueckert, Dong-Joong & Daeryong, 2013). These devices offer convenience and portability, allowing learners to study at their own pace and take ownership of their educational journey, often resulting in improved learning experiences.

Given this trend, researchers in business education are exploring how mobile learning (m-learning) aligns with established technology adoption theories, particularly the Technology Acceptance Model (TAM). As TAM has been successfully applied in many technological domains, scholars are investigating its relevance to mobile learning environments. In doing so, mobile technology adoption is typically examined through three primary TAM constructs: Perceived Usefulness (PU)**,** Perceived Ease of Use (PEU), and Attitude toward Use (ATU).

Perceived Usefulness

Perceived usefulness in the context of mobile devices refers to their capacity to improve both teaching and learning experiences. For instructors, mobile devices facilitate quick access to online study communities and instructional resources. Students can instantly access academic content, such as videos, graphics, and educational simulations.

These tools not only enhance accessibility but also support individualized, anytime-anywhere learning. John-Harmen, Ahmed, and Laurent (2010) noted that mobile devices extend beyond access by reshaping learning modalities, resulting in better educational outcomes. Instructors and students can use “dead time” such as during commutes or between classes to engage in academic engagement. In addition, the motivational appeal of mobile learning often surpasses that of traditional classroom methods.

Moreover, mobile devices tend to be more affordable and energy-efficient than traditional computers, making them accessible to users in low-resource settings. In particular, Android devices, come equipped with functional apps like calculators, email, video players, and educational tools that support curricular goals. They also allow the installation of specialized educational applications developed by institutions and third-party developers.

Perceived Ease of Use

Mobile devices are widely regarded as user-friendly due to their intuitive operating systems, such as Android, iOS, and Windows Mobile, which are designed for experiential learning. Users typically do not require formal training; most can navigate a device’s interface within a short period.

These devices offer customizable home screens, allowing users to organize apps and widgets according to their needs and preferences. Modern mobile devices also include large internal memory and expandable storage options, making it easy to store and retrieve academic materials. Their built-in internet connectivity via Wi-Fi, Bluetooth, or mobile data provide seamless access to learning resources.

Attitude toward Use

A user's attitude toward technology significantly influences its adoption. It is a common misconception among technology providers that simply supplying devices will lead to their effective use. Without adequate training, users may experience anxiety, resulting in negative perceptions and eventual rejection of the proposed technology. Research indicates that a well-designed mobile learning environment, supported by training and user engagement, can transform these attitudes and encourage adoption (Kim et al., 2013). Mugo, Njagi, Chemwei, and Motanya (2017) observed that some educators perceive mobile technologies as disruptive to the learning process, leading many institutions to ban their use altogether, primarily due to concerns about academic dishonesty.

Another attitudinal challenge involves the logistics of implementation. Instructors may resist mobile technology if they anticipate difficulties in integration or perceive it as requiring excessive effort (Park, 2009). In addition, limitations in device functionality can further discourage use. For example, small keyboards or screen sizes can complicate educational engagement cumbersome. However, researchers argue that resolving such technical limitations like enabling wireless external keyboards, can improve usability and promote widespread adoption (Kim et al., 2013).

Technology Acceptance Model Vis-à-vis Use of ICT in Business Education

In practical educational environments, there is often a significant gap between the claimed acceptance of a technology and its actual usage. This disconnect is especially evident in technology adoption, where theoretical acceptance measured by agreement or expressed intent does not always translate into real-world applications (Owie, 2023).

The Technology Acceptance Model (TAM) suggests a direct link between perceived usefulness, ease of use, and subsequent usage. However, empirical evidence indicates that many educators who express positive attitudes toward technology do not consistently incorporate it into their teaching. Acceptance, in this context, may be more symbolic than operational.

Unlike acceptance, which is difficult to objectively verify, actual usage serves as the most concrete indicator that a technology has been integrated into teaching and learning. The inconsistency between acceptance and application raises questions about the sincerity or feasibility of technology integration in educational settings (Skoumpopoulou, 2018).

Within Business Education, it is common for educators to affirm their acceptance of ICT tools in surveys or interviews, yet show minimal engagement with these tools in classroom practice. Studies by Owie and Igbinedion (2022), as well as Owie and Eshemogie (2023), confirmed that despite widespread verbal support for technology use in Business Education, actual implementation remains limited.

This mismatch challenges the core assumption of TAM that acceptance equates to usage and highlights the need to consider additional factors, such as institutional support, technical infrastructure, motivation, and training. Consequently, acceptance and usage should be examined as distinct but related constructs. As Das (2021) noted, not all reported acceptance results in meaningful application, particularly when barriers to use are unaddressed.

Conclusion

The rapidly evolving information landscape requires the strategic adoption and integration of modern technologies, particularly in education. Information and Communication Technology (ICT) has become an

indispensable tool for accessing up-to-date resources and fostering innovation, productivity, and development. In today's digital era, effective utilization of information resources depends largely on one's ability to leverage technology.

However, a lack of digital competence often leads to resistance, which remains a significant barrier to technology adoption. This disconnect can result in underutilization, even when institutions invest heavily in digital infrastructure. Therefore, understanding and applying the Technology Acceptance Model (TAM) is critical for predicting and enhancing the successful integration of new technologies.

Based on the literature reviewed and the context of Business Education in Colleges of Education, it is evident that the theoretical acceptance of technology does not automatically lead to actual usage. Many educators express a willingness to adopt ICT, but this intent is not always reflected in their classroom practices. As such, true acceptance must go beyond verbal affirmation to observable, consistent use.

To ensure that Business Education programmes achieve their intended goals and contribute meaningfully to national development, educators must embrace the realities of technological change. This involves not only accepting ICT tools in theory but also integrating them effectively into teaching and learning processes for more dynamic, engaging, and results-oriented outcomes.

Recommendations

Based on the findings and conclusions of this study, the following recommendations are proposed to enhance the effective adoption and integration of ICT in Business Education:

1. **Capacity Building for Lecturers:** Lecturers should receive comprehensive training to equip them with the digital skills and knowledge required to effectively support students in the use of ICT tools for learning. This training should be continuous and tailored to meet both general and pedagogical technology needs.
2. **Organize workshops and seminars:** Lecturers should hold regular workshops and seminars on the practical use of common instructional technologies. These sessions should not only provide hands-on training and highlight the instructional advantages of ICT integration. Awareness of these benefits can significantly influence their adoption and application in the classroom.
3. **Enhance Student Digital Literacy:** Lecturers should actively support students in developing their ICT competences, particularly in using the internet and digital tools for academic purposes. Orientation programs should be provided to help students distinguish between academic and non-academic use of digital technologies and foster meaningful engagement with online resources.
4. **Promote Positive Attitudes Toward ICT:** The success of ICT integration depends heavily on lecturers' attitudes. Since behavioral intention strongly influences actual use, it is essential to foster a positive mindset toward technology. This can be achieved through targeted training that builds digital confidence and demonstrates the relevance of ICT in achieving instructional goals.

By implementing these recommendations, lecturers will be better equipped to modernize their teaching methods, promote active learning and effectively, meet the demands of 21st-century education.

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