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DETERMINANTS OF TECHNOLOGY-ASSISTED LEARNING METHODS IN HIGHER EDUCATION ESTABLISHMENTS

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The motivation behind this study is the emergence of technological tools that are rapidly transforming teaching and learning from passive knowledge acquisition confined to physical classrooms to active knowledge construction in the increasing virtual spaces. Despite the need to accelerate the digitization of learning, some institutions have demonstrated low uptake of technologically-assisted learning due to various factors, hence prompting a review study on the determinants of Technology-Assisted Learning Methods (TALM). For understanding, a qualitative research methodology has been employed involving the study of previously published research retrieved from Google Scholar, ERIC, and ScienceDirect databases and findings analyzed qualitatively alongside an in-depth exploration of the Unified Theory of Acceptance and Use of Technology (UTAUT). The findings reveal a positive influence of facilitating conditions, hedonic motivation, social influence, habit, performance expectancy and effort expectancy on behavior intention to adopt technology. Similarly, course assessment, course design and instructor characteristics have a strong relationship with actual use. The findings of this study will inform educators, university management boards and policy makers on the considerations before integrating technology types in learning programs. This work suggests further investigation of the determinants based on a country's level of development.

Keywords: *Behavior Intention, Actual Use, Digital Divide, Artificial Intelligence, Technology-Assisted Learning.*

Introduction

The past decade has witnessed a drastic shift in how learning is managed in higher learning institutions. This has been made possible by integrating technology in the various facets of learning management. Technology-assisted learning is regarded

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by Sun et al. (2008) as the "Paradigm of Modern Education". Before, learning predominantly adopted an objectivist model, which assumes the transfer of objective reality; this is the traditional view of education, which promoted the lecture method of teaching. Contrastingly, the constructivist model postulates multi-dimensional sets of reality and assumes that students learn best when they are allowed to fully participate and interact during the learning process and make sense of the information they interact with. Therefore, it is the use of technology in learning that birthed the constructivist model, which involves learning by doing (Allsop, 2016). This model argues that children don't need to be forced to learn because, as they playfully interact with objects and people, they construct new knowledge about physical and social worlds. The advantages listed by Allsop (2016) for using technology in a constructivist classroom include active involvement of the learners, collaboration, development of higher-order learning skills, promoting a learner-centred environment, allowing investigation and instant access and management of information. A couple of limitations were also attributed to this approach, including rigorous and time-consuming training of staff, rapidly evolving technology renders staff and systems redundant, the problem of designing standardized assessment tools and the difficulty of customizing activities to individual students (Allsop, 2016). As education systems worldwide continue to step up their investments in knowledge-based economies, technological tools take a centre stage in upscaling goods and service delivery (Soko et al., 2024).

Despite a seemingly consensus that technology incorporation in learning management is inevitable, there has been hesitance towards full adoption of various technologies due to a number of reasons. Pinzariu (2020, p. 2) opines that robotics, the Internet of Things (IOT), augmented reality (AR), virtual reality (VR), mixed reality (MR), artificial intelligence (AI) are among the educational technologies that have garnered significant attention over the past decade. They are regarded as essential elements for stimulating Information and Communication Technology (ICT) investments and for highlighting how important studies in information technology are in performance and learning enhancement through the effective selection, utilization, and management of suitable technologies in relation to resources and processes. The current interconnectedness in the world, where the traditional concept of formal learning is happening in a typical physical classroom, is gradually losing relevance. There has been a general wave of dissatisfaction with the stand-and-deliver approach to teaching, which dictates the class attendance hours, meeting venues and participation modes. The discovery of sophisticated communication modes and digital or mobile devices has finally led to a new breed

of information consumers who are not confined to learning at stipulated hours and locations (Turnbull et al., 2020).

The surge of COVID-19 as witnessed from 2019 to the better part of 2020 and beyond also intensified technology-based learning in various institutions of learning in several parts of the world. Virtual learning through platforms like Google Meet, Zoom, Microsoft Teams, Canva and Blackboard became increasingly common. Not only were the teaching-learning activities transformed due to the pandemic, but also services like library, admission, counselling and many more evolved. Jagannath (2020) stated that the services that institutions used to provide in traditional teaching must be immediately transformed to online for the educational institution to remain competitive and sustainable in the sector. Statistically, a global digital population of 5.56 billion internet users, accounting for 67.9% of the global population were had active accounts in February 2025 (Statista Search Department, 2025). This is a very high figure that cannot be underestimated when education sector reforms are being implemented.

Hu et al. (2007) describe Technology Assisted Learning as the application of information technology to improve and facilitate individual learning processes (p. 2). They plainly state that in reference to Technology-Supported Learning, Technology-Assisted Learning, Technology Enabled Learning, distance learning and e-learning, rather, all these terminologies are used interchangeably. Nevertheless, the distinction between distance learning and online learning or rather e-learning, is that whereas the latter is conducted via the internet, the former is conducted as a learning mode via e-learning. Similarly, online teaching can be distinguished from emergency remote teaching, though both terminologies are used in reference to the spatial distance between the tutors and their students (Zacharis & Nikolopoulou, 2022). The shift from traditional education to virtual learning has been driven by rapid development in information and communication technology (ICT), hence impacting teaching, learning and knowledge management (Naidoo, 2020). This view further agrees with a report published by UNESCO in 2009, indicating that Higher Education Institutions have been utilizing technology exclusively for instructional purposes in diverse ways.

Remarkable improvement has been noted in higher education academics because of the technologically-backed e-learning systems, which, despite being new, are considered a formidable information communication technology option for the education sector (Al-Mamary, 2022a). Currently, substantial research links education with both the economic and social well-being of countries. A high investment in human capital is a notable commonality in all developed countries. The use of technology to assist learning can easily be derailed, as witnessed in

many developing countries, by factors such as inadequate funding and resources, technical and administrative gaps and inadequate training. Education systems in these countries are therefore unable to effectively utilize and integrate new technologies. On the contrary, this failure to integrate technology is not uniform across all continents. Not only are learning management systems, online learning and e-learning critical in teaching and learning. They are crucial for resource sharing and synchronized communication between teachers and students (Zacharis & Nikolopoulou, 2022).

The rate of internet usage in the world today shows that approximately 64% of the world's population uses the internet regularly. Whereas in countries like the Netherlands, Norway, and Saudi Arabia, 99% of the population used the internet, North Korea, on the contrary, was ranked last worldwide with virtually no usage reported by February 2025. Other continents like Africa had a huge gender disparity in usage of the internet in favour of men by a 10% margin as of 2024, unlike the Commonwealth, the United States and Europe, where the margin is very minimal. 93% of people from high-income countries, as opposed to 27% from low-income countries in Africa, parts of Asia and South America, used the internet in 2024 (Statista Search Department, 2025). The above statistics are crucial in initiating an investigation into the relationship between higher education internet use, access and technology-assisted learning. From previous studies, this paper seeks to establish from the inconsistent statistics whether there is a spatial gap in research that would alter the results by ensuring that studies from marginalized cultures and regions are also explored.

According to Al-Mamary (2022a), the use of technology to assist learning is not new but has existed for a long period. The only difference is that computers have recently become very common in universities, hence the need to keep updating the conventional teaching and learning techniques using the latest innovations. Besides developed countries, developing countries have seen a laxity in adapting e-learning despite significant investments made (Boateng et al.2016, cited in Alhabeeb and Rowley, 2018). Notwithstanding, it is not fully clear whether there are specific factors that inform individual higher education establishments to choose given technology-assisted platforms for teaching and learning. This study is therefore meant to unravel the specific factors that can be put into consideration by the higher learning institutions before they procure or consider the implementation of a Technology-assisted learning method.

The guiding question for this study is to examine the determinants of Technology-Assisted Learning Methods (TALM) in higher education establishments.

Methodology

A qualitative research approach was employed as the dominant methodological strategy, involving literature review and identifying the main themes addressed by published literature. To ensure relevant literature was retrieved from key studies, specific key terms were used, like "technology-assisted learning methods", "determinants of e-learning". Google Scholar and ScienceDirect were the main search databases used. Various exclusion and inclusion mechanisms were used to arrive at a manageable number of documents. 38 articles (mainly full text and a few abstracts) and 1 web page were identified as relevant. The exclusion of the rest of the articles was due to the insufficiency of the data referring directly to the determinants of e-learning in higher education.

From each paper, the findings section was screened to establish and extract meaningful data related to the question. The synthesis and inductive analysis of the retrieved evidence led to the emergence of specific themes from the data. Without the use of any specific software, this data was summarised, analysed and reported based on the themes identified. To ensure proper triangulation of results, the samples were selected from diverse studies conducted across the world. The majority of the papers (15) were from Asian countries, 13 from European countries, 6 from North America, with the remaining 3 from Africa, 1 from Australia & Oceania, and 1 from South America.

According to Dequanter et al. (2022), the determinants of TALM can either be facilitators if they positively impact the use and adoption possibility or barriers if they obstruct the adoption and continued use and they can further be classified into Individual, Technological or contextual factors. However, insights from the Unified Theory of Acceptance and Use of Technology (UTAUT) crafted by Venkatesh et al. (2003) and modified in 2012 greatly shaped the themes. The factors extracted as determinants (Independent variables) of the user intention in the original UTAUT model include performance expectancy, facilitating conditions, effort expectancy, and social influence (Venkatesh et al., 2003). The expanded model incorporated factors that improved the prediction of behavior use and intention, including hedonic motivation, price value and habit (Venkatesh et al. 2012). The researcher opted to omit price value as a main predictor based on its classification as a moderator (Tarhini et al.,2016) whilst introducing instructor characteristics, course assessment and course design in the new model proposed in later studies (Soko et al.,2024). According to Tarhini et al. (2016), the behavioral intention and actual use of technology are the dependent variables. The moderating variables identified to be discussed in this paper include: age, cost, personal innovativeness, gender, uncertainty avoidance, self-efficacy, and experience. The

UTAUT framework has been widely adopted in research to measure technology adoption because it allows a concurrent description of the motivations for using technology (Utomo et al., 2021).

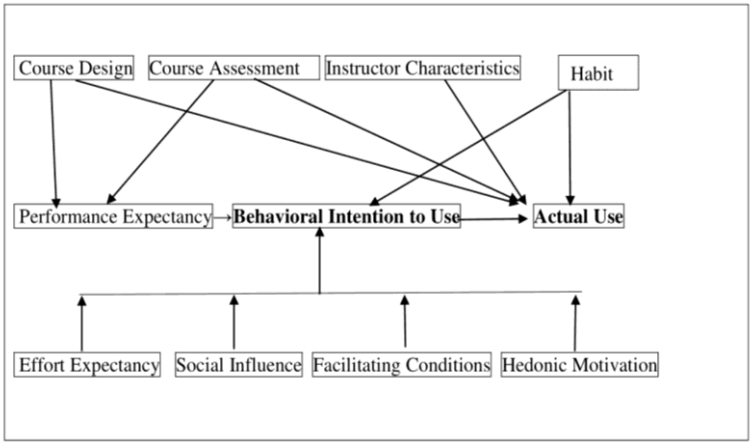

Figure 1. Determinants of technology-assisted learning mthods (Source: author)

Results

An individual's willingness to accomplish a task is referred to as behavioural intention (Chu & Chen, 2016). In reviewing the already published literature on this topic, various determinants contributed to the behavior intention, actual use of technology by students or both (Tarhini et al., 2016, p. 2; Soko et al, 2024, pp. 3-4). Scholarship has adduced evidence that factors influencing behavior intention do not necessarily relate to a homogenous group, for example, students, but can also affect both students and educators. For instance, behavioural intention to use e-learning systems is both influenced by performance expectation and computer self-efficacy (Kim & Park, 2018). These determinants range from instructor-related to student-related or both and are as follows:

Performance expectancy

Performance expectancy, according to Venkatesh et al. (2003), as cited in Zacharis & Nikolopoulou (2022), as the percentage of people who believe that the use of technology rewards work. In recent times, many sectors have adopted technology because of its usefulness in everyday life. Studies indicate that a user's perceived usefulness of technology influences its adoption (Raza et al., 2021; Haron et al., 2021; Abbad, 2021). Nevertheless, a statistically insignificant relationship was recorded among Ethiopian health science students on the use of e-learning.

Similarly, between performance expectancy and students' behavior intention among Saudi Arabian University students, no significant relationship was established (Al-Mamary, 2022b), concurring with another study among university students in Zambia (Hunde et al., 2023; Soko et al., 2024). Almaiah et al. (2019) indicated that whenever there is a perception among students that the use of technology will ultimately result in a benefit, there is a significant increase in the intention to use it.

Effort expectancy

Effort expectancy is the supposed ease ascribed to technology utilization (Zacharis & Nikolopoulou, 2022, p. 3). Adoption of technology is largely dependent on the degree of ease of use of the technology in question. When the effort needed when using technology is minimal, there is a sense of relief to adopt it. Not only are the benefits perceived by the user limited to function but also include ease of use (Utomo et al., 2021, p. 5). Whenever users feel that less effort has been applied while using technology, it creates a perception that the technology simplified their routine and thus is rewarding. A study among university students in Zambia indicated that an easy-to-use learning management system has a higher chance of being adopted. Similarly, studies in Jordan and India that applied the UTAUT model between behaviour intention to accept technology and effort expectancy resulted in a positive correlation (Bansal et al., 2022, pp. 7-9; Abbad, 2021), consistent with the findings of Al-Mamary, (2022b, p. 8) that established a constructive and favorable influence of effort expectancy on behavior intention. The study in Zambian Universities proposed simple-to-use learning management systems to attract more students.

Facilitating condition

Facilitating condition entails the conviction that the adoption of a technology is made possible by the supportive infrastructure around it (Venkatesh et al., 2003, as cited in Zacharis & Nikolopoulou, 2022, p. 3). These conditions are either physical or environmental, and they can either promote or hinder access to the utilization of technology by students. Some facilitating conditions include reliable electricity, training on the use of TALM, internet connectivity, affordable computers, expertise and availability of time. The impact of facilitating conditions on behavior intention from the original UTAUT model was found to be inconsequential (Venkatesh et al., 2003; Almaiah & Alyoussef, 2019, p. 14). According to Abbad (2021), the actual use of TALM among university students is most vitally influenced by

facilitating conditions. Research on measures like social distancing and implementation of online learning enforced by the Pakistani government to curb the surge of COVID-19 found no strong link amid enabling conditions and behavior intentions to use TALM. This concurs with a study among Zambian university students, which revealed a negative correlation between the variables. This was attributed to failure by universities and policymakers to technically assist and train students on the use of the learning management system (Al-Mamary, 2022b, pp. 8-9). However, earlier studies conducted separately in India and Jordan on the use of e-learning modes had verified the positive effect of facilitating conditions on behaviour intention (Bansal et al., 2022; Abbad, 2021).

Contrastingly, among university students in Zambia, facilitating conditions influence the use of TALM positively; this aligns with other earlier studies (Al-Mamary, 2022b; Bansal et al., 2022). Actual use and adoption of a learning platform is determined by the presence of resources, the know-how and skills. The sufficiency of an infrastructure that supports the use of a learning management system drives students to use it. (Al-Mamary, 2022b,).

Hedonic motivation

Hedonic motivation relates to the element of pleasure, satisfaction and fun that results from the use of technological devices (Zacharis & Nikolopoulou, 2022, p. 5). It is the extent to which the use of computers is perceived as enjoyable, regardless of the ramifications of their use. Enjoyment has a positive bearing on the students' perception of the necessity of technologically-assisted devices and their user-friendliness (Hanif et al., 2018, p. 7).

The impact that hedonic motivation has on the use of learning management systems (LMSs) is attested to by a study that investigated whether students in Zambian universities derived pleasure from TALM. Findings from that study significantly attributed hedonic motivation to the intention to use a learning management system (Soko et al., 2024, p. 11). This means that the likelihood of acceptability of an e-learning mode is highly dependent on the pleasure and enjoyment derived from its use (Sitar-Tăut, 2021, p. 8). These outcomes agree with findings from other prior investigations, which affirmed that hedonic motivation impacts behavior intention to use TALM (Bansal et al., 2022, p.9; Zacharis & Nikolopoulou, 2022, pp. 13-14).

Habit

This can be defined as the repetitive behavior which is a derivative of a learning process (Venkatesh et al., 2012 as cited in Utomo et al.,2021, p. 6). The recent explosion of information and communication in education has influenced people's attitudes and behavior towards situations. Learning institutions have kept emphasizing behavior and attitude change to promote academic excellence. The success of a learning process creates a notion of user friendliness of technology, a perception that reinforces repetition. As people get accustomed to applying technology when carrying out tasks, they tend to intensify the tendency to continue using it (Utomo et al., 2021). Handoko et al. (2020) state that the students' intention to adopt technology is largely affected by repetitive behavior. Based on a survey done in Greece, when using e-learning platforms, habit is considered the strongest predictor of behavior intention (Zacharis & Nikolopoulou, 2022, pp. 13,15). Previous studies reveal that the probability of university students adopting e-learning platforms increases with frequent use of technological devices like Blackboard and Moodle. (Tarhini et al., 2017).

Social influence

Social influence encompasses social compulsion exerted on a person because of the ideas of third parties or organizations (Al-Mamary, 2022b, p. 3). It is also known as social norm (Tarhini et al., 2016, p. 4). It is estimated that by the year 2012, the global human population had been outnumbered by mobile telephone devices; most of these devices were possessed by youths aged 18-29, the college-going age (Statista Search Department, 2025). Because these phones are affordable, light and provide multiple applications that connect students socially, their adoption has been on the rise. In Greece, a study among university student teachers showed that these students are more influenced to use mobile devices due to the pressure that those in their social circles are also using them (Zacharis, 2020, pp. 1,17). The findings confirmed university students' perception of their lecturers, fellow students and peers' ability to influence them in using e-learning platforms. This aligns with research from the USA and Pakistan (Tarhini et al., 2017, p. 1; Raza et al., 2021, pp. 11,15,17).

Similarly, the UTAUT model showed a considerable impact of social influence in promoting the use of TALMs (Venkatesh et al., 2012). The intention of Zambian university students to use learning management systems was positively correlated with their social influence. By raising awareness through the social

media, university websites and mass media these students can be persuaded to embrace TALM more (Al-Mamary, 2022b, p. 8).

Course design

Ensuring the simplicity of an e-learning course design to students mitigates against demotivation and distraction. To tell whether a TALM is poorly designed or not, the following features are considered: the learning goals and mode of evaluation, organization and presentation, technology use and interpersonal interactions (Zilinskiene, 2022, p. 10). Debattista (2018, pp.7-8) argues that a good instructional design analyses learning needs and utilizes appropriate techniques to meet them. These designs should ensure that technologies and resources support learning. According to Soko et al. (2024, p. 11-12), the course design - use of TALM relationship is negative among university students in Zambia. The possible cause of this was cited to be complexity of course designs or lack of key design features that improve tutor-student interactions. Educators must develop the requisite competencies and abilities needed to create e-learning resources. A study in Malaysia, however, established a contrastingly favorable connection between course design and actual use of technology (Haron et al., 2021, p. 8) similar to another in Saudi Arabian university students that showed a positively significant connection between course design and performance expectancy of e-learning systems (Almaiah & Alyoussef, 2019, p. 12).

Course assessment

A course assessment should have the capacity to create and administer assignments, quizzes, tests and also give feedback using the same learning management system. Beside course assessment and TALM use among Zambian university students being found to be positively correlated, getting immediate feedback, which is a key achievement of technology, enables learners to make the necessary corrections and allows the teacher quality time to focus on helping students (Soko et al., 2024, p. 12). Research revealed that Saudi Arabian university students' performance expectations and actual e-learning usage were positively impacted by course assessment. (Almaiah & Alyoussef, 2019, pp. 12-13).

Instructor characteristics

Contextually, the instructor characteristics that influence e-learning adoption are attitude towards e-learning, computer proficiency, anxiety levels and computer self-efficacy. The behavior of the instructor can potentially promote the adoption

and diffusion of technology and instructor-student interaction can reduce dissatisfaction levels. Empirically, online learning is facilitated by instructor characteristics like the urge to teach, the ability to motivate students, the instructor's ability to use the system and the instructor's teaching style (Alhabeeb & Rowley, 2018, p. 1). The instructor's behavior can also demotivate students if he discourages them from using the TALM. Among university students in Zambia, there was a negative correlation between instructor characteristics and actual use of technology meaning that the instructors have contributed to the uptake of online learning among the students (Soko et al., 2024, p. 13). This view is supported by other findings from a study on Saudi Arabian university students which revealed that the positive impact of instructor characteristics is indicative of the ability of instructor self-efficacy and positivity towards e-learning to serve as motivation to students (Almaiah & Alyoussef, 2019, p. 13).

Discussion

The results of this review demonstrate that the determinants of technology-assisted learning methods are categorized into two, that is, with regard to how they impact the behavior intention to use the technology or the actual use. Students should expect meaningful benefits when using technology to perform tasks. Studies among university students in Ethiopia and Zambia established a statistically insignificant connection between user intention of technology for educational reasons and performance expectancy (Hunde et al., 2023, p.7), contrary to findings from other studies in Malaysia and Hong Kong (Al-Mamary, 2022b, p.7). In Zambia and Indonesia, an easy-to-use learning management system has been recommended for university students informed by studies that revealed a positive affiliation existing between the ease and the adoption of technology, similar to results from studies in India (Bansal et al., 2022, p. 9; Handoko et al., 2020).

Elsewhere in Pakistan, research showed no significant statistics associating enabling conditions with behavior intention to use technology among university students during the COVID-19 period. Although similar results were recorded among students in Zambia, there was a positive relationship between enabling conditions and actual use among Zambian students (Al-Mamary, 2022b, p. 8). Nevertheless, earlier findings from India and Jordan established a positive relationship between enabling conditions and behavioral intention to use technology (Abbad, 2021; Bansal et al., 2022, p. 9). Deriving pleasure from the use of technology has not only been found to impact actual use but also influences the behavioral intention. Hedonic motivation is attested to positively impact the intention to use a learning management system (Soko et al., 2024, p. 11; Zacharis

& Nikolopoulou, 2022, pp. 13-14). The probability of adopting the use of e-learning was primarily found to be dependent on the pleasure derived from using it (Sitar-Tăut, 2021, pp. 7-9).

The more accustomed people become to using technology the higher the chance of intention to adopt it (Handoko et al., 2020, p.4). This view concurs with Tarhini et al. (2017) who opine that the probability of university students adopting e-learning heightens with the frequency of using technological devices. Zacharis & Nikolopoulou (2022, pp. 13,15) cited habit as the strongest predictor of use of technology among university students in Greece. Social influence positively influenced the intention to use mobile devices for learning and other e-learning platforms among university students in Greece, Zambia, USA and Pakistan (Raza et al., 2021, pp. 11,17; Al-Lozi, 2016 cited by Tarhini et al., 2016, p. 4). Because of the social influence that university students generate among themselves and their lecturers, sensitizing them on various forms of technology through social media, mass media and the university website can increase the chances of use and adoption (Al-Mamary, 2022b, p. 8). Almaiah & Alyoussef (2019, p. 14) explain that whereas some studies influence the use of e-learning positively, others showed no significant influence and hence the likelihood that social influence is dependent on a person's culture and varies from country to country.

Among Zambian university students, Soko et al. (2024, pp. 11-12) reported a negative relationship existing between course design and the use of TALM, citing a possible cause to be the complexity of course designs or lack of design features that would enhance tutor-student interaction. This can be remedied by ensuring the requisite competencies are acquired by the educators and skills to design resources for e-learning are developed. However, these findings contradict other studies from Malaysia and Saudi Arabia that revealed positivity in the connection between course design and the actual use of technology (Haron et al., 2021, p. 8). The inclusion of important information, for instance, the course layout, objectives and outcomes in a course design can therefore catalyse the students' use of TALMs. Considering the reviewed literature, what prohibits many universities from the integration of technology is the compromised curriculum design quality for e-learning implementation.

According to Soko et al. (2024, p. 12), a positive connection exists between course assessment and technology use because utilising technology for assessment provides the learner with immediate feedback, hence motivating them. Additionally, course assessment was found to positively influence performance expectancy, as observed among Saudi Arabian university students (Almaiah & Alyoussef, 2019, pp. 12-13), which suggests that providing online self-assessment

test programs contributes to the use and acceptance of virtual or electronic learning methods.

The instructor's characteristics can potentially motivate or demotivate students to use technology. Among university students in Saudi Arabia and Zambia, the instructor characteristics were found to negatively influence the actual use of technology, implying that the instructors have contributed to the uptake of online learning among the students possibly due to characteristics such as anxiety and lack of computer efficacy (Soko et al., 2024, p. 13; Almaiah & Alyoussef, 2019, p. 13). Furthermore, these findings indicated that the instructor's experience preparing assignments, virtual classes and uploading courses serve as motivation to the learners to apply e-learning in subscribing for courses, submission of assignments and downloading learning resources. Therefore, universities should conduct regular professional development trainings so that the lecturers are adequately skilled to manage technological advancements.

Research has consistently considered demographic variables like age, education level, gender, self-efficacy, and cost as moderators of behaviour intention and real use of technology in the context of education (Tripathi (2018, pp. 12-13; Tarhini et al.,2016, p. 2). Tripathi (2018, p. 26) posits that perceived cost is not a factor of concern for technology adoption and that the relationship between cost and actual usage is insignificant. His study further agreed with Venkatesh (2003) by finding age as a moderating variable where the youth are more likely to embrace technology with ease compared to the old, concordant to those of Tarhini et al. (2016, p. 8). Additionally, experience and self-efficacy among Azerbaijani university students revealed significant impact on the perceived ease of use of e-learning (Chang et al., 2017, p. 12), findings that comply with those of Abdullah et al. (2016, p.13) but contradicts Tripathi (2018, pp. 26-27) who found stronger effects on actual usage realised from more experienced users. However, Lai et al. (2021, p.9) found no significant relationship between self-efficacy and behavior intention. Technological innovations have a significant moderating effect between subjective norm, perceived usefulness and the behavior intention to use TALM (Chang et al., 2017, p. 11-12) who further pointed out that among Azerbaijani university students, computer anxiety negatively influenced perceived usefulness of e-learning's while experience and enjoyment had a positive influence. All socio-cultural norms like risk aversion, hierarchical distance, masculinity, individualism and femininity have a strong moderating impact on behavioral intention (Tarhini et al., 2016, p. 10).

Conclusion and recommendations

Over the years, several theoretical standpoints have attempted to explain the determinants of Technology Assisted Learning Methods (TALM) in education. Though the literature in this study has significantly explored the UTUAT theory, other models like the Technology Acceptance Model (TAM) as well as the theories of Reasoned Action (TRA), and that of Planned Behaviour (TPB) have also contributed largely to the understanding of the determinants of Technology-Assisted Learning (e-learning adoption). Despite the extensive previous research on the significance of ICT on developing technological infrastructure, educators need to understand students' perceptions to improve remote learning (Mugruza-Vassallo & Suárez, 2016, p. 3). Universities and e-learning designers also need to enhance e-learning interfaces to be more appealing and enjoyable for learning. Further research will be useful in the differentiation of user behavior to determine whether technology is purchased impulsively or compulsively (Iyer et al., 2020, p. 2).

The subject of TALM cannot be fully brought to a closure unless the question of the rate of internet use, speed and access is put into consideration. Statista Search Department (2025) exposed a concerning gap in internet use, speed and access worldwide, citing European Countries with the Highest Internet Speed while Africa lagging behind. Northern Europe has 97.9% internet penetration, while Sub-Saharan Africa is still under-connected, with a global average of 67.9% (Statista Search Department, 2025). Future studies need to investigate the determinants against such statistical divides to promote the generalizability of the findings. Finally, since most studies on the determinants of TALM have been conducted in economically advantaged regions, this review recommends that more studies should be contextualised to developing nations.

Conflict of Interests
The author declares no ethical issues or conflict of interests in this research.

Ethical standards
The author affirms this research did not involve human subjects.

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ՏԵԽՆՈԼՈԳԻԱՊԵՍ ՀԱԳԵՑԱԾ ՈՒՍՈՒՑՄԱՆ ՄԵԹՈԴՆԵՐԸ ԲԱՐՁՐԱԳՈՒՅՆ ԿՐԹԱԿԱՆ ՀԱՍՏԱՏՈՒԹՅՈՒՆՆԵՐՈՒՄ

Անյինյո Նորման Օյուգա

Այսօր տեխնոլոգիան արագորեն վերափոխում է ուսուցումը՝ պասսիվից դեպի ակտիվ գիտելիքներ վիրտուալ տարածքներում: Այդուհանդերձ, որոշ հաստատություններում ուսուցման մակարդակը դեռևս տեխնոլոգիապես ցածր է: Տեխնոլոգիապես հագեցած ուսուցման մեթոդների քննությանը (TALM) վերաբերող սույն ուսումնասիրությունը հիմնված է զուգորդված տեխնոլոգիաների ներդրման և օգտագործման միասնական տեսության (UTAUT) վրա: Արդյունքները բացահայտում են նպաստող պայմանների, հեդոնիկ նպատակաուղղվածության, սոցիալական ազդեցության, սովորույթի, սպասելիքի և ջանքերի դերը տեխնոլոգիան ընդունելու և կիրառելու վարքագծի տարբեր դրսևորումներում: Դասընթացի գնահատումը, դասընթացի դիզայնը և դասախոսի կերպարը նույնպես մեծապես կարևոր են տեխնոլոգիայի կիրառման հաճախականության հարցում:

Բանալի բառեր՝ *վարքային մտադրություն, իրական կիրառում, թվային բաժանում, արհեստական բանականություն, տեխնոլոգիաների ներդրմամբ ուսուցում:*