

The impact of COVID-19 on reading behaviors among high school students through the adoption of mobile learning

Ra'ed Masa'deh^{a*}, Dmaithan Abdelkarim Almajali^{b,f}, Salwa AL Majali^c, Nida AL-Sous^{b,f} and Haya Almajali^d

^aThe University of Jordan, Jordan

^bApplied Science Private University, Jordan

^cAl Ain University, United Arab Emirates

^dJerash Private University, Jordan

^fApplied Science Private University, Research unit, Middle east University, Jordan

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ABSTRACT

In this study, the impact of COVID-19 lockdown on Jordanian high school students' reading habits and attitudes was examined. COVID-19 has indeed affected education systems all over the world; education institutions all over the world were compelled to implement innovative technological approaches so that education could still be delivered to students, fulfilling the academic expectations, while the Sustainable Learning and Education (SLE) ideals are consistently embraced. One of these approaches has been the use of mobile learning applications (MLA). These applications (MLAs) employ some prominent features of mobile apps, to allow students to collaborate and participate in purposeful online learning. Still, the success of any technology is dictated by the acceptance of the user, in this context, the acceptance of students. In other words, student acceptance of MLA will determine the success of MLA. Accordingly, the effect of COVID-19 lockdown on the information behavior of high school students was examined in this study, with MLA being used by these students. Data were gathered from 394 high school students in Jordan. These students were chosen randomly, and they were all mobile phone users. The data covered the 2022–2023 fall term and were analyzed using Structural Equation Modeling (SEM). Based on the analyses results: Self-Efficacy and Perceived Compatibility had significant impact on Perceived Performance Expectancy and Perceived Effort Expectancy; Perceived Convenience and Perceived Effort Expectancy had significant impact on Perceived Performance Expectancy; Perceived Enjoyment had significant impact on the Behavioral Intention to use MLA; COVID-19 had significant impact on the Behavioral Intention to use MLA; Perceived Compatibility showed no significant impact on Perceived Enjoyment; and Perceived Effort Expectancy, Perceived Performance Expectancy and Perceived Compatibility showed no significant impact on the Behavioral Intention to use MLA. The outcomes of this study demonstrate a practical indication in support of digital information behavior among high school students in this era.

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1. Introduction

Learning systems with capability of quick learning adaptation and transfer are vital in today's complex and demanding situations, as such systems would assure sustainable learning and education (Ahmad et al., 2020; Chen & Chen, 2022). In addition, these learning systems offer skills that students need to survive and develop sustainably in the future. With free online

* Corresponding author.

E-mail address: r.masadeh@ju.edu.jo (R. Masa'deh)

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resources available, students could access and keep the information they need. Furthermore, during COVID-19 pandemic, the utilization of mobile learning technologies has had significant impact not only on the process of learning but on the development of teaching techniques as well (Coskun-Setirek & Tanrikulu, 2021; Lee & Hsu, 2021).

By April 2020, COVID-19 had caused about 50% of the world population to be at a forced halt, and such incidents had a dramatic impact on various life aspects of people. Many sectors were deeply affected, including that of education. Schools, universities and other educational bodies were forced to shut down because the traditional face-to-face classroom could not be carried out, to curb the outbreak of the disease, and yet, education needed to resume. Consequently, educational institutions had resorted to employing new technologies so that education could be delivered to students anywhere and anytime (AlMajali & Masa'deh, 2021; Taamneh et al., 2022). With these technologies, education has drastically changed, and this has resulted in the inquiry for new methods of technology. Accordingly, distance learning has been used in replacement of conventional learning, and this has transformed the old-style learning environments (face-to-face learning) into distance learning.

The present day has been marked by various significant inventions of man, including that of mobile technologies (Al-Emran et al., 2020), particularly after the outbreak of a lethal disease caused by coronavirus of COVID-19. Using such technologies, learners could learn anytime and anywhere. Mobile devices that involve the utilization of wireless information and communications technologies allow societies to be connected at all times no matter where they are or the time (Zaidi et al., 2021). Mobile devices also facilitate users in processing and transmitting information (Al-Emran et al., 2020).

This new form of learning, namely mobile learning, blends a universal communication technology and advanced user interfaces (Sharma & Kitchens, 2004; Al-Hamad et al., 2021). This method of learning facilitates learning content access through its advanced method, operated via mobile devices (Naciri et al., 2020). For users, only a smart mobile device with internet connection is required, and they would be able to engage in learning anytime and anywhere. Indeed, mobile learning has caused the conventional face-to-face learning environments to be transformed into remote learning. Learners could learn remotely and privately (AlMajali & Masa'deh, 2021).

COVID-19 outbreak has forced many institutions including educational institutions to shut down as one of the efforts to prevent the virus from spreading through physical contact. Still, education cannot be stopped for too long as this would have a serious adverse impact to the people and the country on the whole. In order to assure continuity of education, educational institutions had to employ different approaches to teaching (Naciri et al., 2020; AlMajali & Masa'deh, 2021). This can be exemplified by technology usage in teaching and learning, for instance, mobile learning which is run via mobile apps. Mobile apps are apps that blend mobile technologies with educational systems (Gao et al., 2014; Al-Hamad et al., 2021). At the same time, it has been acknowledged that acceptance of users would affect technology adoption success (Bao et al., 2014; Nikou, 2019, 2021). In addition, new apps like m-learning apps have not been comprehensively examined, particularly with respect to how these apps impact education (Althunibat, 2015; Nikou, 2021).

Many recent studies have come up with a model to illuminate the acceptance of users of Mobile Learning Apps (MLA), many of these studies employed some commonly used acceptance theories and explored the interrelations between these theories. When different theories are applied into one model, technology acceptance could be understood from a different outlook, and this could result in novel knowledge (Nikou, 2019, 2021; Al-Husamiyah & Al-Bashayreh, 2022). Equally, there has been a literary gap in terms of the models that explore user intention in mobile learning usage (AlMajali & Masa'deh, 2021; Nikou, 2021). Pertinently, in the present study, the researcher sought to establish a model that includes the factors from several established theories for instance, Social Cognitive Theory (SCT) proposed by Bandura (1986), Innovation Diffusion Theory (IDT) proposed by Rogers (2003), in addition to Technology Acceptance Model (TAM) proposed by Davis (1989). Empirical validation works were then performed on the proposed model.

SCT, IDT, and TAM are all highly researched and adopted acceptance theories and models, and these theories and models have been frequently employed as a theoretical base, to allow researchers to dig deeper into the subject of user acceptance. In the model proposed by this study, the factors of Perceived effort expectancy (PF) and Perceived performance expectancy (PE) were based on TAM, the factor of Self-Efficacy (SE) was based on SCT, the factor of Perceived compatibility (PCOM) was based on IDT, the factor of Perceived Enjoyment (PN) was based on Davis et al. (1992), while the factor of Perceived Convenience (PCV) was based on Yoon and Kim (2007).

Generally speaking, the impact of PE, PF, PCOM, SE, PCV, and PN on behavior intention to use MLA was examined in this study, in the wake of COVID-19 era. Specifically, factors with potential impact on MLA adoption and acceptance were explored. A model incorporating some constructs from SCT, IDT, and TAM was proposed, and the constructs included in the model were PE, PF, PCOM, SE, PCV, and PN. This study is unique as it is likely the first to examine the impact of a number of factors, namely the factors of Perceived performance expectancy, Perceived effort expectancy, Perceived Compatibility, Perceived Convenience, Perceived Enjoyment, and Self-Efficacy on MLA, particularly on its adoption and acceptance. Additionally, this study examined how the factors from these established theories (SCT, IDT, and TAM), can have an impact on MLA adopted after COVID-19 period. Also, this study explored the mediating impacts of Perceived effort expectancy and Perceived Enjoyment in the connection between Perceived Compatibility and Behavioral Intention to use MLA.

The easy availability of digital resources and lockdown caused by COVID-19 outbreak have tremendously altered the environments of learning of students (Sung & Chiu, 2022; Yu et al., 2022; Meng et al., 2023), and also the behaviors and attitudes of young adults towards information as they have become more reliant on electronic resources, with the easy access of mobile Internet facilitates (Lau et al., 2020; Chen & Chen, 2022; Jiang et al., 2022). Still, there are challenges faced by students, particularly with regards to information literacy. Apart from that, issues associated with hardware infrastructure may impede the access of students to digital resources (Ko et al., 2015; Ezeamuzie et al., 2022). Changes in information behaviors and attitudes of children caused by COVID-19 have been mentioned, but the underlying causes and effects of these changes have not been examined. In addition, COVID-19 has increased the stress associated with parenting (Wang et al., 2022a). Meanwhile, schools are currently recovering from the ill impacts brought by COVID-19 (UNESCO, 2021). Hence, the practical support of the electronic resource services of school libraries in Jordan to students during COVID-19 by way of mobile learning, became the focal point of this study. Specifically, this study attempted to ascertain the effect of COVID-19 of the information behaviour of students.

The existence of some modern devices such as tablets, computers and mobile phones allows children and young people to enter into new digital spaces in which they could communicate, obtain information, and play (Gewerc et al., 2017; Gómez et al., 2020, Valencia et al., 2021). For students, technology allows them to gain access to a vast number of educational resources, such as tutorials, online courses, explanatory videos, and even educational games. Through technology also, young people could become better at resolving problems and they can think more critically as well - all these make them better able to cope with today's challenges. Somehow, it has been reported that one's age and year of birth do not dictate one's acquisition of skills in technology (Kirschner & De Bruyckere, 2017; Chiecher, 2020). Hence, being born after the year 2000 does not mean that the person will be skillful in technology even though the person has been exposed to technology all their life. As such, students may have varied digital skills, and they also may lack in certain areas. Furthermore, students from families that lack digital competences owing to the lack of access to technological resources, can be adversely affected in terms of their learning via technology (Díaz-Arce & Loyola-Illescas, 2021).

Not only individuals, but society was also forced to accept the new normal, because of COVID-19. Analogue and digital classrooms began to be used in the education sector, made possible through information and communication technologies (ICTs) (Cabero & Martínez, 2019). Accordingly, learning would occur via distance education and IT usage, making information technologies an important aspect in new knowledge acquisition. Indeed, students possessing digital competences are likely to perform better academically, and they are also more likely to become better professionals. Unfortunately, many students were demonstrating reluctance towards advanced technologies while also lacking the digital competences, which may lead to problems in the future (Kozlov, 2019). The low-level digital skills demonstrated by students may be linked to several factors which may be tackled through a combination of strategies including technology access, sufficient training and guidance, practice, motivation, and interest, and through tackling the problems of language and cultural hurdles.

2. Literature Review

SCT, IDT, and TAM were the theories and models used in combination, to underpin this study. SCT which was proposed by Bandura (1986) is an expansion of Social Learning Theory (SLT). SCT suggests that people, behaviours and environments are presumably involved in a process that is both dynamic and reciprocally engaging. As a learning model, SCT suggests that people alter their behavior in accordance with many environmental variables. Accordingly, there are 6 factors in SCT as follows (Bandura, 1986): Expectations, Observational Learning, Reciprocal Determinism, Reinforcements, Behavioral Capability, in addition to the factor of Self-efficacy. These factors were also in SLT except for the factor of self-efficacy. Self-efficacy was also included in Compeau and Higgins's (1995) study on technology acceptance, and this factor was also included in the present research.

IDT is a theory that illustrates how the innovation process diffuses, and the process is initiated by the innovation progression and development of user attitudes and user's final view of acceptance or refusal (Rogers, 2003). The IDT factors examined were those associated with technology (Hubert et al., 2019). Accordingly, there are five key factors that are potentially linked to the viewpoint of the user (Rogers, 2003), namely: observability of the innovation, compatibility, relative advantage, trialability, in addition to the factor of complexity. Accordingly, the researcher included the factor of compatibility from IDT in the study model.

TAM is a model resulting from Theory of Reasoned Action (TRA). The model was devised to foresee and justify adoption and refusal of use of a given technology (Davis, 1989). TAM allows the exploration of the impact of external factors on the behavior of users, while the main determinants of technology acceptance are ascertained. In TAM, Technology acceptance behaviors are measured through Perceived usefulness (PU) and Perceived ease of use (PEOU) which are impacted by external factors. TAM suggests that PU and PEOU have an impact on Users' Attitude (ATT). Hence, actual use of a given system is impacted by ATT and PU, that in turn impacts Behavioral Intention (BI) (Davis, 1989). In this study, factors impacting user acceptance of MLA were examined using a theoretical model.

Several MLA studies employed SCT, SCT, and TAM, and the use of these theories and models in studies has allowed researchers to test the vigor of these theories and models. These acceptance theories have in fact been incorporated in various studies with the addition of new aspects relevant to the examined technology (Almaiah & Al Mulhem, 2019; Zhonggen & Xiaozhi, 2019; Al-Emran et al., 2020; Alshurideh et al., 2020; Buabeng-Andoh, 2018, 2021; Kumar et al., 2020; Nabipour Sanjebad et al., 2020; Al-Hamad et al., 2021; Al-Rahmi et al., 2021; Pratama, 2021; Sophea et al., 2022). Accordingly, the factors examined in this study are elaborated in the following sections.

Habits of people can be altered by the changes in the environment that they live in (Banshal et al., 2022; Pianzola et al., 2022; Wang et al., 2022b; Yu et al., 2022), and during lockdown owing to COVID-19 outbreak, the reading environment has changed dramatically, leading to a dramatic change to the habits of reading among young people (Sung & Chiu, 2022; Huang et al., 2023).

It has been observed that the regular use of electronic devices has allowed students to read wherever and whenever, with the utilization of their mobile devices, liberating the fairly fixed reading time for students (Kong et al., 2018; Cheung et al., 2022; Ding et al., 2021; Lo et al., 2021). Conversely, studies on network environments that are based fully on click rate have occurred and this has changed the focus of young individuals. Youth should be provided with high-quality reading materials, focusing on the electronically readable materials (Sung & Chiu, 2022). Additionally, precautions must be observed because fake news and information are also being rampantly spread electronically, which could lead to misinformation (Ho et al., 2022; Zhang et al., 2022).

For adolescents, scholars including Reid-Chassiakos et al. (2016) highlighted the need for corresponding media education. In fact, reading skills affect reading habits of adolescents (Yu et al., 2022). Furthermore, the reading process is mainly propelled by reading interest (Anderson et al., 2021). However, the pleasure of reading among youth appears to be dwindling (Clark & Teravainen-Goff, 2020), but the practice of light reading can stimulate people to read more (Le et al., 2019). High school students are consistently pressured to achieve academically, but COVID-19 crisis has significantly affected the reading engagement feeling of students, which has an impact on their intellectual life (Applegate & Applegate, 2004). For this reason, it is crucial that families and schools do not disregard the interest in reading among children.

A study by Thorndike (1976) on the reading activities of middle school students found that students' reading comprehension was mainly improved by several genres including, in no particular order, humor, science fiction, history and biography, myth and legend, as well as adventure and current events. In this regard, it is important to be aware of the passion of today's high school students. To motivate and increase reading among these students, the respective reading materials on their topics of interest should be made available and also promoted (Looi et al., 2023).

2.1 Barriers to e-reading

Many parts of the world still suffer from limited internet usage, implying the still existing digital divide (Chan & Chiu, 2023). In Italy for instance, households with the Internet access made up only 70% of the overall number of households in this country, and the internet was used basically for news reading or socializing (through web 2.0 tools), and over 50% of households in Italy used Wiki for information search (Tammaro, 2020). Indeed, in developed nations including the USA, there are still those who do not own a computer and many people in America have no internet access at home (Mehta & Wang, 2020), and even librarians could not effectively obtain information when at home. The non-existent autonomous workspace and the work-children online learning conflicts have been reported (Mehta & Wang, 2020). Not only that, those majoring in Library and Information Science (LIS) were reporting difficulties in performing academic research because the smartphone screen is too small and the smartphone itself is slow, and these problems were also reported among information literate students (Dukic et al., 2015).

In many countries, absenteeism of high school students from online courses has been reported owing to the lack of the Internet. Additionally, the problem of inaccessible electronic resources was rather serious in developing countries. Also, having no internet at home has hindered children from keeping up with the school curriculum (Asanov et al., 2021). Apparently in Pakistan, the lack of equipment (among others) has prevented many children from participating in online lessons (Adnan & Anwar, 2020). In fact, in developed nations, e-reading is really not that optimistic, and the situation is no better among the developing counterparts. The present study therefore examined the environment of e-reading among Jordanian students, for the purpose of facilitating them through the provision of better support.

3. Hypotheses Development

3.1 Perceived performance expectancy and Perceived effort expectancy

Technology acceptance model has been empirically tested and explored in various studies, and findings have proven the impact of PE on BI (Alshurideh et al., 2020; Kumar et al., 2020; Nabipour Sanjebad et al., 2020; Al-Hamad et al., 2021; Al-Rahmi et al., 2021; Pratama, 2021; Sophea et al., 2022). On the other hand, some reported no substantive link between the

two constructs (PE and BI) (Al-Emran et al., 2020). Other studies that utilized TAM mentioned the effect of PF on PE (see: Alshurideh et al., 2020; Kumar et al., 2020; Nabipour Sanjebad et al., 2020; Buabeng-Andoh, 2021; Sophea et al., 2022). However, there were also studies reporting no observable link between the two constructs (PF and PE) (Kumar et al., 2020). The impacts of PF on BI have been reported as well (see: Al-Emran et al., 2020; Alshurideh et al., 2020; Al-Hamad et al., 2021; Al-Rahmi et al., 2021; Pratama, 2021; Sophea et al., 2022). Nonetheless, the non-significant link between the two constructs (PF and BI) has also been reported (Kumar et al., 2020). As such, the present study proposed testing the following three hypotheses:

H₁: *Perceived performance expectancy affects the intent of Jordanian students towards using mobile learning apps, positively.*

H₂: *Perceived effort expectancy affects Perceived performance expectancy, positively.*

H₃: *Perceived effort expectancy affects the intent of Jordanian students towards using mobile learning apps, positively.*

3.2 Perceived convenience

Perceived convenience or PCV has been applied in many studies on technology acceptance in various domains (e.g., MLA), specifically as a predictor of PU. This construct was introduced by Yoon and Kim (2007). Studies in Taiwan (see: Chang et al., 2012, 2013; Cheng, 2015) reported that when TAM is expanded through the inclusion of other factors, it allows comprehensive evaluation of user acceptance of MLA. Also, the inclusion of PCV into TAM has improved TAM. Furthermore, PCV has been found to be a dependable indicator of PU. The present study hence proposed testing the following hypothesis:

H₄: *Perceived convenience affects performance expectancy both directly and positively.*

3.3 Self-efficacy

The construct of Self-efficacy or SE was first introduced in Social Learning Theory proposed by Bandura (1986), before being included in Compeau and Higgins's (1995) study on technology acceptance. In some studies, SE was used as a predictor of PE and PF. In South Korea, Park et al. (2012) studied the acceptance of university students towards MLA, and results showed no discernible link between SE and PE. In Bangladesh, Fatima et al. (2017) employed TAM with the addition of SE in delving into the acceptance of university students towards MLA and reported SE as a key predictor of both PE and PF. In Malaysia, Kumar et al. (2020) included SE in TAM in studying the acceptance of university students of MLA, and results showed SE a significant predictor of PF. Additionally, the authors reported no significant link between SE and PE. In Malaysia also, Nabipour Sanjebad et al. (2020) employed TAM to examine the factors that impact MLA adoption. SE was included in the model, and results showed SE as a major predictor of PF. In Ghana, Buabeng-Andoh (2021) employed SE to study MLA adoption among university students and concluded SE a significant predictor of PF. In Cambodia, Sophea et al. (2022) examined MLA acceptance among university students, and reported SE as a significant predictor of PF. The authors further mentioned that SE and PE were not significantly linked. As such, the present study proposed testing the two hypotheses below:

H₅: *Self-efficacy affects perceived performance expectancy positively and directly.*

H₆: *Self-efficacy affects perceived effort expectancy positively and directly.*

3.4 Perceived enjoyment

PN was first introduced by Davis et al. (1992), and this construct has been employed as a predictor of BI. In Taiwan, MLA acceptance has been examined by Chang et al. (2013) and Cheng (2015) using PN as one of the variables, and results affirmed PN as a major predictor of BI. In China, Zhonggen and Xiaozhi (2019) added PN into TAM to study MLA adoption among university students and found that PN was a key predictor of BI. In Pakistan, Iqbal and Qureshi (2012) employed TAM with the addition of PN to examine MLA acceptance among university students but saw no discernible link between PN and BI. Meanwhile in Malaysia, TAM was expanded by Al-Rahmi et al. (2021) and Nabipour Sanjebad et al. (2020) in understanding MLA acceptance among university students, and the authors found PN a key predictor of BI. On the other hand, Suki and Suki (2011) reported no significant connection between PN and BI. In Indonesia, Pratama (2021) studied MLA adoption among school students and found PN a significant predictor of BI. Hence, the present study proposed testing the hypothesis as written below:

H₇: *Perceived enjoyment affects the intent of Jordanian students towards using mobile learning apps positively and directly.*

3.5 Perceived compatibility

The present study included the construct of perceived compatibility (PCOM) into its model, and this factor was first used in IDT from Rogers (2003). PCOM has been found to act as a predictor of PF, PE, PN, and BI. In Taiwan, Cheng (2015) examined the acceptance of users of mobile phones of MLA using PCOM and affirmed that this construct was a predictor of the factors of PE, PF, PN, and BI. In Jordan, Almaiah and Al Mulhem (2019) added PCOM into TAM to examine acceptance

of university students of MLA and results showed that BI was mainly predicted by PCOM. The present study therefore proposed these four hypotheses below:

H₈: *Perceived compatibility affects perceived performance expectancy directly and positively.*

H₉: *Perceived compatibility affects perceived effort expectancy directly and positively.*

H₁₀: *Perceived compatibility affects perceived enjoyment directly and positively.*

H₁₁: *Perceived compatibility affects the intention of Jordanian students to use mobile learning apps directly and positively.*

3.6 COVID-19

The outbreak of COVID-19 in December 2019 (Al-Bashayreh et al., 2022, World Health Organization, 2023) has put the entire world to a stop as countries were forced to take some forceful measures as an effort of curbing the spread of the virus to protect the citizens (World Trade Organization, 2023). Most countries imposed lock-downs as a way to halt the virus spread but this also put a stop to economic activities, particularly those involving physical interactions, which also had a bad effect on the lives of the citizens. At the same time, scholars of various domains began to study the impact of this life-threatening disease. COVID-19, in terms of its impact, has been examined, with regards to new technology acceptance and use, such as that on Fintech, involving 71 countries (Fu et al., 2020) and it was concluded that the virus spread and government policies altogether had led to substantial increase in the number of downloads of finance-related applications, by between 33.1% and 36.6%, especially in banking and payments applications. Furthermore, this study showed that apps of government assistance and personal loans in developing countries had somewhat higher download rates. It was then concluded from the results that COVID-19 had a substantial positive impact on the consumer of state-of-the-art technology (e.g., Fintech services). As such, the present study proposed testing the hypothesis below:

H₁₂: *COVID-19 impacts the intention to use mobile learning apps, positively, among Jordanian students.*

3.7 Mediating factors Between PCOM and BI

A construct is classed as a full mediator if its indirect impact exceeds its direct impact (Hair et al., 2016). Perversely, a construct is not classed as a mediator if its indirect impact is less than its direct effect. In the present study, the mediation of PF and PN between PCOM and BI was examined. For this purpose, PCOM was employed to alter PF and PN. For MLA users, the improvement of PF and PN through PCOM could increase their BI. to use MLA. The present study thus proposed testing the two hypotheses below:

H₁₃: *Perceived effort expectancy mediates the relationship between perceived compatibility and intention to use mobile learning apps among Jordanian students in the wake of COVID-19.*

H₁₄: *Perceived enjoyment mediates the relationship between perceived compatibility and intention to use mobile learning apps among Jordanian students in the wake of COVID-19.*

4. Research Methodology

This study involved participation from 394 randomly selected mobile phone users from schools in Jordanian for the 2022–2023 fall term. Data that were acquired from these participants underwent analyses run using SEM while the results were scrutinized to ascertain the impact of the factors under study, on the acceptance level of MLA of the study participants. The demographic information of the participants was obtained as well; most of the participants in this study were male below 18 years old and most were high school students from public secondary schools in Jordan.

The questionnaire was the method used for data gathering, and all items in the questionnaire were from past related works. Except for the demographic items, each item was equipped with a seven-point Likert scale with: 1 to denote most disapproving response, 4 to denote neutral response, and 7 to denote most agreeable response. There were altogether 34 items in the questionnaire covering eight factors. Reliability of the instrument items was tested, and as mentioned by Sekaran and Bougie (2016), values of Cronbach's alpha from 0.77 to 0.94 demonstrate sufficient reliability level and the level is higher than what is usually sufficient for exploratory research. Specifically, the achieved value of Cronbach's alpha was respectively 0.905, 0.915, 0.858, 0.900, 0.873, 0.945, 0.779 and 0.920 for Performance expectancy, Effort expectancy, Perceived convenience, Self-efficacy, Perceived compatibility, Perceived enjoyment, COVID-19, and Behavioral intention to use.

Meanwhile, validity of the instrument was ascertained through the use of expert judgment as proposed by Hair et al. (2016). Specifically, several IT experts, who were PhD holders, were asked to evaluate and refine the study instrument. The questionnaire was then accordingly amended based on the feedback of these experts.

Table 1
Measurements and sources of research constructs

Factor	Measurement items
Perceived Convenience (Yoon & Kim, 2007)	MLA is convenient because it allows me to use it at any time.
	MLA is convenient because it is portable.
	MLAs are convenient because they are simple to use.
Self-Efficacy (Compeau & Higgins, 1995)	My task could be completed with MLA without help from others.
	My task could be completed with MLA even with my first MLA use.
	My task could be completed with MLA even with only the application manuals to refer.
	My task could be completed with MLA even by only observing someone else using it at first.
	My task could be completed with MLA if I there was someone to call when I am stuck.
	My task could be completed with MLA if there was someone to help me to begin the use process.
	My task could be completed with MLA with adequate time.
	My task could be completed with MLA with built-in help facility to help me.
Perceived Compatibility (Moore & Benbasat, 1991)	MLA usage is compatible with nearly all my learning aspects.
	MLA usage matches my style of learning.
	MLA usage fits well with my best way of learning.
Perceived Enjoyment (Davis et al., 1992)	I think MLA usage is enjoyable.
	The actual MLA usage seemed pleasant to me.
	MLA usage is fun for me.
Perceived Performance Expectancy (Davis, 1989)	I finish my tasks in my studies more quickly when I use MLA.
	I learn better when I use MLA.
	I am more productive in my studies when I use MLA.
	I learn more effectively when I use MLA.
	Doing my learning tasks is easier when I use MLA.
Perceived Effort Expectancy (Davis, 1989)	MLA would be useful in my learning.
	It would be easy for me to run MLA.
	The use of MLA would be easy for my purposes.
	I would have clear and understandable interaction with MLA.
	MLA would offer me flexible interactions.
Behavioral Intention to Use (Davis, 1989)	Being an expert MLA user would be easy for me.
	I think MLA use would be easy for me.
	I have intention to use MLA for my study.
	I expect the use of MLA for my study.
	I plan to utilize MLA for my study.

4.1 Common method bias

In this study, single component tests developed by Harman (1976) were used to determine whether "common method variance," or CMV for short, poses an empirical risk. According to Harman's single-factor test, CMV becomes difficult if the first element causes the most variance. After conducting an unrotated exploratory factor analysis on all the questions, the researchers discovered that the first factor only explains 36.2% of the variance, indicating that CMV is not significantly flawed. The results of this test allow the researchers to state that CMV has not had an impact on the results of this investigation.

5. Results

5.1 Confirmatory Factor Analysis

Confirmatory factor analysis or CFA is an appropriate method in the verification of the factor structure or the factor loadings of the variables under observation. Additionally, evaluations were made in this study, on composite reliability (CR), convergence validity, and convergent validity, and the achieved results can be viewed in the following Table 2, while results on discriminant validity can be viewed in the ensuing Table 2.

As displayed in Table 2, the loadings of all items were within the range of 0.591 to 0.912. According to Bollen (2019), factor loading of items should be 0.50 or higher, while factor leading of 0.70, or higher, is perceived as ideal. Hence, based on Bollen (1990), factor loadings attained in this study are perceived as acceptable. Using factor loadings, convergent validity can be evaluated, by way of composite reliability (CR) and average variance extracted (AVE). In this study, the obtained values of composite reliability were between 0.804 and 0.928, which were larger than 0.7, implying good internal consistency. Additionally, the obtained values of average variance extracted (AVE) were between 0.553 and 0.798; these values were larger than the proposed cut-off value of 0.50. Based on Hair et al. (2016), it can be said that all latent variables in this study demonstrated convergent validity. In addition, AVE analysis results shown in Table 3 show that all values were greater than 0.5 and greater than all correlation coefficients between constructs. Thus, discriminant validity was achieved.

Table 2
Confirmatory factor analysis results (Factor loading)

Latent Variable	Indicator	FL	FLS	AVE (> 0.50)	CR (> 0.70)
Performance Expectancy	PE1	0.72	0.518	0.553	0.880
	PE2	0.783	0.613		
	PE3	0.84	0.706		
	PE4	0.756	0.572		
	PE5	0.658	0.433		
	PE6	0.689	0.475		
Effort Expectancy	PF1	0.794	0.630	0.557	0.883
	PF2	0.768	0.590		
	PF3	0.725	0.526		
	PF4	0.686	0.471		
	PF5	0.703	0.494		
	PF6	0.795	0.632		
Perceived Convenience	PCV1	0.857	0.734	0.702	0.876
	PCV2	0.829	0.687		
	PCV3	0.828	0.686		
Self-Efficacy	SE1	0.774	0.599	0.564	0.928
	SE2	0.767	0.588		
	SE3	0.591	0.349		
	SE4	0.803	0.645		
	SE5	0.734	0.539		
	SE6	0.782	0.612		
	SE7	0.701	0.491		
	SE8	0.745	0.555		
	SE9	0.854	0.729		
	SE10	0.733	0.537		
Perceived Compatibility	PCOM1	0.774	0.599	0.581	0.804
	PCOM2	0.646	0.417		
	PCOM3	0.852	0.726		
Perceived Enjoyment	PN1	0.867	0.752	0.798	0.922
	PN2	0.901	0.812		
	PN3	0.912	0.832		
COVID-19	CO1	0.784	0.615	0.553	0.830
	CO2	0.767	0.588		
	CO3	0.591	0.349		
	CO4	0.812	0.659		
Behavioral Intention to Use	BI1	0.887	0.787	0.751	0.901
	BI2	0.866	0.750		
	BI3	0.847	0.717		

Note: FL = Factor Loading, FLS = Factor Loading Squared, AVE= Average Variance Extracted, CR= Composite Reliability

Table 3
Discriminant validity

	1	2	3	4	5	6	7	8
1. Performance Expectancy	.553							
2. Effort Expectancy	.532	.557						
3. Perceived Convenience	.417	.451	.702					
4. Self-Efficacy	.516	.518	.521	.564				
5. Perceived Compatibility	.336	.446	.578	.482	.581			
6. Perceived Enjoyment	.051	.054	.011	.048	.026	.768		
7. COVID-19	.503	.343	.540	.372	.554	.047	.553	
8. Behavioral Intention to Use	.068	.108	.069	.081	.086	.548	.121	.751

Accordingly, the final best-fitting model, as shown in Fig. 1, was produced using the results from Table 2 and Table 3.

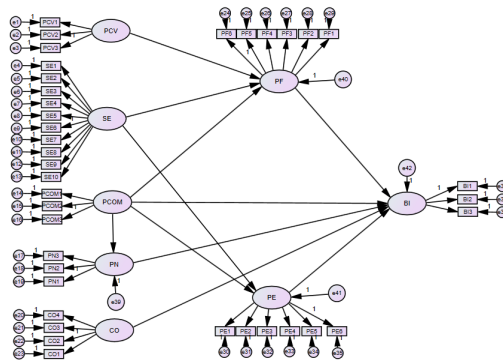


Fig. 1. Final best fitting CFA model

5.2 Goodness of fit

The model's goodness of fit can be evaluated using indicators such as Standardized Root Mean Squared Residual (SRMR), comparative fit index (CFI) with proposed cut-off value of ≥ 0.90 , Tucker and Lewis's index of fit (TLI) with proposed cut-off value of ≥ 0.90 , normed fit index (NFI) with proposed cut-off value of ≥ 0.90 , in addition to the root mean square error of approximation (RMSEA) with proposed cut-off value of ≤ 0.10 . Other recommended cut-off values are: Chi-square $\chi^2(P > 0.05)$, $\chi^2/df \leq 3$ and IFI ≥ 0.90 . The details are provided in the following Table 4.

Table 4
Final measurement model fit

X ²	X ² /DF	SRMR	CFI	TLI	NFI	IFI	RMSEA
49.994	4.99	0.034	0.977	0.936	0.972	0.978	0.10

As can be viewed in Table 4, SRMR value obtained was lower than 0.08 and based on Hu and Bentler (1999), it can be perceived as an excellent model fit. Excellent fit of the model was also proven through its CFI value which was higher than 0.95 as proposed by Kline (2005), its obtained TLI value which was larger than 0.90 as proposed by Sharma et al. (2005), its NFI and IFI values which were both larger than 0.90 as proposed by Hu and Bentler (1999). Additionally, the attained RMSEA value of less than or equal to 0.1 denotes a good fit to the model (Brown, 2015). Based on the results of the indexes, the proposed model can be perceived as fit.

5.3 Testing the hypotheses

The present study tested its proposed hypotheses using variance-based Structural Equation Model (SEM). Such a method was appropriate for the study context because it could simultaneously model relationships between multiple dependent and independent variables. Details are provided in the ensuing sub-sections.

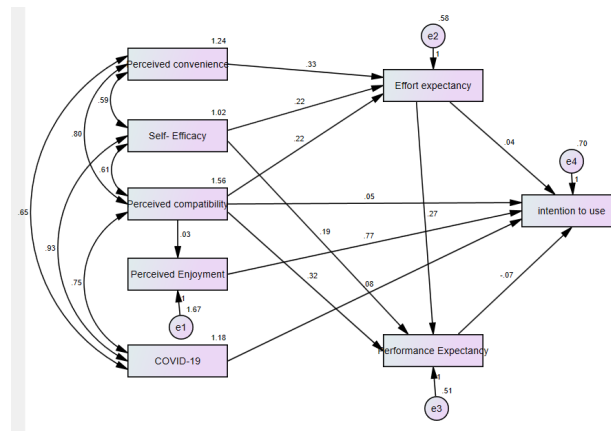


Figure 2. The SEM model for the hypotheses

SEM test results of the first 12 hypotheses can be viewed in Table 5, while results for hypotheses 13 and 14 can be viewed in Table 6 below.

Table 5
Structural equation modelling regression weights

			Estimate	S.E.	C.R.	P	Result
PF	→	BI	0.042	0.054	0.776	0.438	Not Supported
PF	→	PE	0.268	0.044	6.085	***	Supported
PE	→	BI	-0.067	0.058	-1.154	0.248	Not Supported
PCV	→	PF	0.332	0.045	7.382	***	Supported
SE	→	PF	0.216	0.046	4.672	***	Supported
SE	→	PE	0.186	0.043	4.312	***	Supported
PN	→	BI	0.766	0.033	23.519	***	Supported
PCOM	→	PF	0.223	0.039	5.698	***	Supported
PCOM	→	PE	0.318	0.036	8.75	***	Supported
PCOM	→	PN	0.027	0.052	0.515	0.606	Not Supported
PCOM	→	BI	0.046	0.048	0.954	0.34	Not Supported
CO	→	BI	0.081	0.049	1.639	0.001	Supported

Note: S.E. = Standard errors of the regression weights, C.R. = Critical Ratio, P = p-value (* <0.05 , ** <0.01 , *** <0.001)

Results in Table 5 can be elaborated as follows:

Regression weights results showed insignificant effect of the factor of Perceived Effort Expectancy on Intention to Use of Jordanian students of e-learning. The obtained critical ratio value was lower than 2 while the achieved p-value was higher than 0.05, specifically at 0.438. Based on Byrne (2013), the path can be construed as insignificant. As such, the first hypothesis was rejected. Regression weights results showed a positive direct effect of Perceived Effort Expectancy on Perceived Performance Expectancy. Here, the obtained critical ratio value was higher than 2 while the p-value (***) was lower than 0.001. According to Byrne (2013), the path can be perceived as significant. As such, the second alternative hypothesis was accepted.

Regression weights results showed insignificant impact of Perceived Performance Expectancy the Intent of Jordanian students towards usage of E-learning. Here, the obtained critical ratio value was lower than 2 while the obtained p-value was higher than 0.05, specifically, 0.248. Based on Byrne (2013), the path can be perceived as insignificant, and so, the third hypothesis was rejected. Regression weights results showed positive direct effect of the factor of Perceived Convenience on Perceived Effort Expectancy, proven by the obtained critical ratio value of more than 2 while the obtained p-value (***) was lower than 0.001, denoting significance of path as recommended by Byrne (2013). Hence, the fourth alternative hypothesis was accepted. Regression weights results showed a positive direct effect of the factor of Self-efficacy on Perceived Effort Expectancy. The obtained critical ratio value was larger than 2 while the achieved p-value (***) was smaller than 0.001. According to Byrne (2013), the path can be construed as significant. As such, the fifth alternative hypothesis was accepted.

Regression weights results showed a positive direct effect of the factor of Self-efficacy on Perceived Performance Expectancy. The obtained critical ratio value was higher than 2 while the achieved p-value (***) was lower than 0.001, which means that the path demonstrates significance as proposed by Byrne (2013). Based on these outcomes, the sixth alternative hypothesis of this study was accepted. Regression weights results showed positive direct impact of Perceived Enjoyment on the Intent of Jordanian students towards the Use of E-learning. Results showed a critical ratio value of larger than 2 while the obtained p-value (***) was lower than 0.001, which, according to Byrne (2013), denotes the significance of the path. The seventh alternative hypothesis was hence accepted.

Regression weights results showed a positive direct effect of Perceived Compatibility on Perceived Effort Expectancy, with critical ratio value higher than 2 and p-value (***) lower than 0.001. Based on Byrne (2013), the path is significant, and so, this study's eighth alternative hypothesis was accepted. Regression weights results demonstrated positive direct impact of Perceived Compatibility on Perceived Performance Expectancy, as the critical ratio value obtained in this study was higher than 2 while the achieved p-value (***) was lower than 0.001. The results denote path significance according to Byrne (2013), and acceptance of the study's ninth alternative hypothesis.

Regression weights results showed insignificant impact of Perceived Compatibility on Perceived Enjoyment. The achieved critical ratio value was lower than 2 while the p-value attained was 0.606 which was larger than the value of 0.05. Based on Byrne (2013), the path was insignificant, and therefore, this study rejected the tenth hypothesis. Regression weights results showed an insignificant effect of the factor of Perceived Compatibility on the Intention of Jordanian students to use E-learning. The critical ratio value obtained was larger than 2 while the obtained p-value was greater than 0.05, specifically, 0.34. Based on Byrne (2013), the path was insignificant, and therefore, the study's eleventh hypothesis was rejected. Regression weights results showed significant effect of COVID-19 on the Intention of Jordanian students to use E-learning, and for this hypothesis (twelfth hypothesis), the achieved critical ratio value was larger than 2 while the p-value was higher than 0.05, namely 0.101. According to Byrne (2013), the path is insignificant, and so, the hypothesis was accepted.

The following Table 6 presents the conjectured mediating effects of two variables in this study namely Perceived Effort Expectancy (PE) and Perceived Enjoyment (PN). Notably, mediating effect occurs when the indirect effect is greater than the direct effect but not vice versa (Hair et al., 2016). The obtained results showed that PE does not mediate the relationship between perceived compatibility and the intention of Jordanian students to use mobile learning. In addition, PN does not mediate the relationship between perceived compatibility and the intention of Jordanian students towards mobile learning usage.

Table 6
Mediating effects

Hypothesis	from	Mediation	To	Direct effect	Indirect effect	Mediation
H13	PCOM	PE	BI	0.322	0.032	No mediation
H14	PCOM	PN	BI	0.410	0.028	No mediation

6. Discussion and Conclusion

COVID-19 affected high school students and their parents. For students, COVID-19 has prompted them to passively embrace the online model during school teaching and during tutoring sessions as well, causing them to utilize the electronic devices more frequently. In this regard, it is crucial that these students have good self-control to assure desirable learning outcomes

(Sung & Chiu, 2022). Notably, the model of online courses was not the same when compared to that of the conventional face-to-face (F2F) classroom. Accordingly, the outbreak of COVID-19 has caused the lessons of English, physical education (PE) and liberal arts to be delivered using electronic devices (Yao et al., 2023). Notably, for high school students, some subjects could be more effectively taught with the availability of online platforms that promote discussions, and submissions of WeChat group learning progress reports and homework. In addition, online learning does not allow face-to-face communication. As such, students could not receive timely guidance and supervision. Contrariwise, the situation differs for postgraduate students, as these students frequently communicate with their peers and lecturers using electronic devices. Meanwhile, as reported by Wong et al. (2023), within the high school, the increase in social media usage has increased the student-parent communications, while diminishing the student-student communications.

It was reported that during online classes, news and message reminders that pop up on social media could impair the focus of high school students. Additionally, students were reported to purchase learning materials from online dealers rather than from bookstores. Relevantly, as reported in studies (Chan et al., 2020; Sung & Chiu, 2022; Yu et al., 2022; Li et al., 2023), the subjective attitudes of high school students towards COVID-19 would affect their visits to public libraries, and the pandemic has generally caused reduction of visits of these students to the library. Furthermore, lockdown has provided high school students with more free time to engage in reading activities. In fact, studies (see: Kong et al., 2018; Sung & Chiu, 2022) found that more expansive and deeper reading had long-term positive effect on high school students, but, Wong et al. (2023) found that those students that suffer from poor self-control may suffer from internet addiction, and this can affect them negatively.

The change of sports behaviour of youths caused by COVID-19 has also been observed. As mentioned by Luo & He (2021), youths found using sports apps at home very efficient in maintaining their exercise regime. Additionally, sports education may be facilitated by social media. Lockdown also causes people to spend more on network-related devices and services, like cameras, computers, tablets, network bandwidth, app membership fees, and so forth. On the other hand, students spent less on tuition expenditures because online tutoring classes were usually cheaper in comparison to face-to-face instruction (Yao et al., 2023). Also, there was no travelling cost as the classes were carried out online, which means that students could attend their classes from their home. Owing to this situation, the accountability of parents to supervise their children's learning was increased. Timely supervision of parents is crucial because children with poor self-control may end up misusing the electronic equipment - which was initially meant for learning - and they may even be addicted to the internet (Sung & Chiu, 2022; Wong et al., 2023). This state-of-the-art teaching model which was used during the COVID-19 pandemic required parents to seek guidance from the school and library in addition to cooperation from both the school and the library.

The present study proposed a theoretical model in investigating the factors that could impact the acceptance of users of MLA. The model was based on SCT, IDT, and TAM, the tried-and-true acceptance theories and models. Based on the literature review, there were seven (7) factors with potential impact on the acceptance of MLA as follows: Perceived Performance Expectancy (PE), Perceived Effort Expectancy (PF), Perceived Compatibility (PCOM), Self-Efficacy (SE), Perceived Convenience (PCV), Perceived Enjoyment (PN), and COVID-19 (CO). Based on the extant literature, it was clear that PCV, SE, PCOM, PF, PE, CO and PN were yet to be used together in examining MLA. Meanwhile, PCOM, SE, PCV, and PN were found to have an impact on PF, PE, and BI of MLA. Al-Husamiyah and Al-Bashayreh (2022) reported that combining different acceptance theories may increase understanding and explanation of user acceptance. An acceptance model was accordingly constructed in this study and a total of fourteen hypotheses were proposed, conjecturing relationships between the factors in the model. The strength of each conjectured relationship was evaluated via a survey carried out on randomly chosen students from selected schools in Jordan for the 2022-2023 fall semester.

From the results, it was clear that both PF (H1) and PE (H3) did not have a significant direct impact on BI to use MLA. Contrariwise, significant impact of PE on BI has been reported in a number of studies (see: Alshurideh et al., 2020; Kumar et al., 2020; Nabipour Sanjebad et al., 2020; Al-Hamad et al., 2021; Al-Rahmi et al., 2021; Buabeng-Andoh, 2021; Pratama, 2021; Sophea et al., 2022), and PF (Al-Emran et al., 2020; Alshurideh et al., 2020; Al-Hamad et al., 2021; Al-Rahmi et al., 2021; Pratama, 2021; Sophea et al., 2022). These two factors were affirmed as non-predictors of BI in this study, and the results are justifiable by the fact that all participants in the present study were forced to use MLA because during the pandemic, MLA was the only available learning resource. Furthermore, Jordanian students showed good performance with mobile devices and they also used the Internet substantially in obtaining the information needed. Such result however, was unexpected, and so, more investigation is needed on this matter. Apart from that, the different findings in this study could be linked to the differences in student preferences and culture, between industrialized and developing countries.

Results demonstrated significant positive impact imparted by PF on PE (H2). A strong correlation between these two factors was also reported in other extant studies (see: Al-Emran et al., 2020; Alshurideh et al., 2020; Kumar et al., 2020; Nabipour Sanjebad et al., 2020; Al-Hamad et al., 2021; Buabeng-Andoh, 2021; Sophea et al., 2022). This finding demonstrates that a productive MLA does not necessarily catch the interest of the user if its user finds its usage difficult. Furthermore, the adoption of new technology can be justified through the two highly correlating factors, namely PF and PE.

Results showed a positive impact of PCV on PF (H4). Similarly, Chang et al. (2013), Cheng (2015) and Chang et al. (2012) who examined user acceptance of MLA reported that users viewed MLA as convenient because the app was simple and usable

regardless of time and location. Hence, MLA perceived as useful will also be perceived as convenient. SE was affirmed to have positive impact on PF (H5) based on the study results, and also as reported by Fatima et al. (2017). SE was also affirmed to have positive impact on PE (H6) based on the study results and also as reported by Buabeng-Andoh (2021), Kumar et al. (2020), Nabipour Sanjebad et al. (2020) and Sophea et al. (2022). Both outcomes showed that SE improves the capability of students in learning while also providing them the required confidence towards acceptance of new technology.

Results affirmed the significance of PN in affecting BI for MLA usage (H7), and this finding was in agreement with that of Al-Rahmi et al. (2021), Nabipour Sanjebad et al. (2020) and Pratama (2021). Additionally, PN was affirmed as an excellent predictor of BI in the present study. This shows that students in Jordan perceived MLA as enjoyable. As such, it is necessary to consider PN during the content and applications designing stage for mobile learning. A pleasant, fun, and enjoyable MLA is more likely to be used by students. Results also proved a positive direct impact of PCOM on PF (H8) and PE (H9). Cheng (2015) also reported a similar finding. Learners can evaluate MLA according to how well the app matches their PCOM of MLA. Providers of MLA should thus come up with MLA that is compatible with previous experiences, needs, present values, and the embraced styles of learning of learners.

The achieved results showed that PCOM did not impact both PN (H10) and BI (H11). Contrariwise, Almaiah and Al Mulhem (2019) found significant impact of PCOM on both PN and BI. It can be said that the finding of this study was unexpected and rare, and so further studies into the matter should be carried out, within the context of Jordan particularly. Additionally, Results also proved a positive direct impact of COVID-19 on MLA usage intention (H12). In an extant study by Fu and Mishra (2020) on the effect of COVID-19 on the adoption and use of new technologies, such as Fintech, is a positive correlation between COVID-19 and the use of new technologies like Fintech, was concluded. Lastly, results showed that PF did not mediate the connection between PCOM and BI (H13). On the other hand, Cheng (2015) found not mediation of PN in the link between PCOM and BI (H14).

7. Suggestions on emergency online classes

The imposition of lockdown because of the outbreak of COVID-19 had a great impact on high school students. Schools and parents both had to equip themselves for emergency online classes. High school students in Jordan for instance, were pressured to prepare for their college entrance examination, and on average, they had to study for nearly 12 hours each day. Also, students had to study on their own most of the time, in addition to having to attend school classes online. It is thus important that schools provide students with efficient course arrangement while also taking into account how students study at home on their own. It was recommended that the school guide the parents in forming a learning space with minimal interference of electronic devices, considering that the students involved in this study were from middle to upper-class boarding schools.

Simplicity is important, and so, electronic equipment would be easy to use. Computer should be chosen, as opposed to a mobile device (McGovern-Trone & Turner, 2013; Al-Shammari, 2020). Meanwhile, irrelevant apps like social media need to be removed from the electronic device that is used for learning to assure focus, and in order to prevent distractions, software message reminders need to be disabled. The online learning system should be used in communicating the formal learning (Li et al., 2023; Yao et al., 2023). During online class, cameras should be turned on both sides (students and teachers) (Wang et al., 2020), and in order to stimulate discussions and inquiries, students should make sure that their microphone is on. Owing to the importance of cameras and microphone, parents should always assure that both devices are working well.

As for mobile devices, they are only appropriate in the preparation and uploads of homework photos. In fact, mobile devices should be placed outside the learning space after usage. Some studies (e.g., Deng et al., 2019; Chan et al., 2020; Yip et al., 2021; Leung et al., 2022; Zhou et al., 2022) proposed prohibiting mobile devices within the learning space, for schools that is, but for university settings, mobile devices usage among students was not perceived as problematic. In a number of courses like art (Wang, 2018), English (Wang et al., 2015), physical education (Franklin & Smith, 2015), current affairs and politics (Chou et al., 2012), and STEM (Amer & Ibrahim, 2014; Xie et al., 2023), scientific set up and electronic device like iPads would be appropriate. However, students should be mindful and impose control in their use of electronic devices so that they would not end up being distracted by entertainment, social media and games on their devices (Chan et al., 2020; Cheng et al., 2023; Wong et al., 2023).

8. Research implications

The present study imparted some theoretical implications through its exhaustive model built upon factors from well-established acceptance theories and models (SCT, IDT, and TAM) namely PE, PF, PCOM, SE, PCV, CO and PN. The impact of these factors on MLA acceptance was examined. Results showed the impact of PE, PF, PCOM, SE, PCV, CO and PN on MLA adoption after the pandemic of COVID-19. The aforementioned factors were selected in this study to combine the social, technical and psychographic outlook within a comprehensive model. Notably, review of literature showed positive link between the factors of PE, PF and PCOM, and MLA adoption. However, it should be noted that these findings were obtained during normal settings, not during crises like after a pandemic like that of COVID-19. In fact, these relationships appeared to

be less critical from the viewpoint of users, after the pandemic. Additionally, Perceived Enjoyment had a direct and significant impact on BI of MLA usage, based on the obtained results.

Aside from the theoretical implications, this literary work also has practical implications, especially for educational institutions. In order to stimulate students' use of MLA, software creators should take into account the factor of Perceived Enjoyment during the designing of MLA. In doing so, students would experience personalized or distant learning through their mobile devices.

9. Limitations and future work

Several major limitations emerged while conducting this study. The first limitation concerns the fast advancement of technology and information, and this means that students may change their opinions as time passes. For this reason, further study may improve the current methodology so that the obtained results would have better accuracy. Another major limitation concerned the study context, which was merely Jordan, that is, the present study only covered one country, which means that results may have limited generalizability. Hence, future study should cover other countries in order that the results would be more applicable to other nations or countries, while also allowing comparison. The third major limitation was the study model which was limited to only the theoretically proven factors of behavioral intention for MLA usage.

Equally, the researcher had several recommendations for future works. Firstly, the next study on mobile learning acceptance should examine the different mechanisms existing between voluntary and forced usage settings. Not only that, future studies should take into account the impact of geography and culture considering that user acceptance of novel and modern technology has been found to have direct linkage to certain characteristics, as can be observed being discussed by Staddon and Chow (2008). Furthermore, the model proposed in this study should be validated again by considering other factors with potential impact on MLA acceptance among users. Also, future studies should verify the present study's theoretical model by evaluating the acceptance of users of different IT applications, such as the extended reality in MLA.

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