

EFL Students' Use of E-Books for E-Learning: Applying Technology Acceptance Model (TAM)

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Abstract—This paper examines trends of using e-books as a learning tool among EFL students of Al-Balqa Applied University (BAU) by applying the Technology Acceptance Model (TAM) and the number of English language courses as an external independent variable. Data is collected by administering a questionnaire to 283 respondents from Humanities and Social Sciences Faculties along with Medical, Engineering, and Science Faculties. Data is analyzed using SPSS and AMOS statistical analysis software. The analysis reveals that perceived ease of use (PEOU) positively affects perceived usefulness (PU) and attitudes towards using e-books, PU has a significant effect on attitudes and intentions to use e-books, and the attitudes have significant intentions to use e-books. On the other hand, attitudes and intentions are not significantly related to the regular use of e-books in comparison to students with limited use of e-books. Finally, the students who studied or are studying three or more English courses have positive attitudes and higher intentions towards using e-books if compared to those who studied less than three. This study is important to get a better understanding of e-book reading intentions among university students. It is believed to be the first study of undergraduates' intention on using e-book during/after the pandemic in Jordan using TAM.

Index Terms—using e-books, TAM, EFL learners, online learning, COVID-19

I. INTRODUCTION

The rapid development of digital content is apparent in 21st century. It necessitates the employment of technology that is one of the robust driving forces of education during / and in the aftermath of Covid-19 pandemic. This pandemic brought about an unexpected and emerging shift in human life and learning styles. It caused and is still causing drastic changes to peoples' lifestyle. Unexpectedly, almost all aspects of living including social, political, administrative, educational, and cultural changed. Teaching and learning at schools and universities received dramatic mutation as well, expressly, the schools and the universities that utilize in-person classes. Although some educational institutions all over the world are offering online degree programs to transcend time, space and cost barriers (Lethumanan & Tarmizi, 2011; Luo et al., 2021), almost all of the educational institutions transformed into online classes because of the partial and total closures and lockdowns (Viner et al., 2020).

Whether they are prepared or not for this transition, Covid-19 pandemic revealed that the “digital poverty or lack of digital capabilities are a broader problem” to education (Barber, 2020). The urgent use of online learning imposed challenges on learners, instructors, educational institutions and even families. Learners and instructors started online classes that involved using e-books. Educational institutions all over the world abruptly approved e-books as a learning and a teaching tool (Pittaway & Malomo, 2021; Luo et al., 2021). Thus, the spread of digital books established its position in almost all classrooms in no time. The e-book could be defined as “[a] book which is composed in or converted to digital format for display on a computer screen or handheld device.” (Shadiev & Yang, 2020, p. 534). The engagement of e-books in most universities has three key strategic priorities: “to enhance the students experience and academic outcomes within an increasingly competitive environment; to drive innovation in learning, teaching and research; and to help to use space and human resources more effectively and efficiently” (Fyfe, 2014, p. 3). Focusing on a textbook as a source of knowledge and a learning tool, this study aims to investigate the trends of utilizing e-books in English language learning and the preferences of Jordanian university English as a foreign language (EFL) students for using them.

A. E-Book Reading

Reading through an e-book introduced changes to reading behaviors. The effective use of e-books for learning purposes rests on the engagement of an educational model that responds to the needs of learners (Lethumanan & Tarmizi, 2011). Some e-books are produced with digital characteristics: search, cross reference functions, multimedia features and hypertext links (Vassiliou & Rowley, 2008). Others have digital applications like dictionaries and audio/visual icons. Still, there are many e-books that are chiefly scanned copies or digital representation of printed books in PDF and HTML formats which will not suit all learners (Lethumanan & Tarmizi, 2011). Digital searching,

types of books searched, allocated time per session, downloading, digital notetaking, and book sharing are all emerging practices for reading habits (Levine-Clark, 2015; Luo et al., 2021).

These practices are linked to physical and psychological health issues like iPad neck, computer vision syndrome and screen-related sleeplessness (Myrberg & Wiberg, 2015; Pittaway & Malomo, 2021). In some cases, the psychological factors are given prominence over the technological ones (Ackerman & Lauterman, 2012). “*Students may have an unconscious bias for the ‘known mode’ of reading*” (Pittaway & Malomo, 2021, p. 5). Namely, screen reading is more psychological rather than technological since turning and touching pages aid the memory and make it easier to remember (Myrberg & Wiberg, 2015) while scrolling on a computer makes it difficult to remember (Mangen et al., 2013).

B. TAM

Technology Acceptance Model is based on the theory of reasoned action (TRA). It is originally developed by Davis (1985) to predict the user acceptance of a new information system before launching that technology. This model proposes that the use is predicted by behavioral intentions. It is based on two main constructs, i.e. PU and PEOU (Alwreikat et al., 2021). Davis (1985) defines PU as the degree to which a person believes that using a particular system would enhance his or her performance, and defines PEOU as the degree to which a person believes that using a particular system would be free of effort. The central notion of the original TAM, which is displayed in Figure 1, is that the possible user’s behavioral intentions (BIs) to use a new information system is regarded as the major element that identifies his/her usage of the system. The BIs to use the system is affected by the user’s attitudes towards using that new technology. These attitudes are affected by two main constructs, namely, PU and PEOU that a user has about the use of that technology. PEOU affects the PU. There are also the external variables (EV) that may directly influence the PU and PEOU. In other words, if the technology is easy to use, then it is usefully perceived, and users’ attitudes and intentions are more positive towards it.

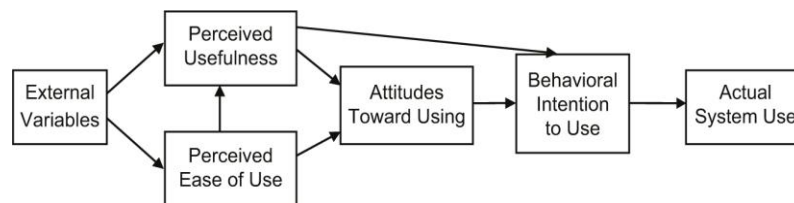


Figure 1. TAM (Davis, 1985)

C. Rationale of the Study

Understanding how students perceive using e-book and their attitudes towards using it for reading fluency and comprehension during and after Covid-19 will help teachers and officials of online learning at universities to improve their services to match students’ optimal use. Accordingly, this research proceeds as follows. In the next section, the researchers review the previous studies related to the features of e-books reading and using e-books for learning, and then it is followed by a clarification of the theoretical model that underlines this research (TAM) with focus on using e-books for EFL learning. Next, the methodology section presents an overview of data collection method and analysis tools. Section four highlights the analysis and findings of the study. Finally, a discussion of the results and their implications and the conclusion are presented.

II. LITERATURE REVIEW

A. E-Book Use for Learning (E-Textbook)

E-books incorporation in educational institutions is inevitable to reach a more innovative and technological educational environment, in addition to the urgent use of e-books as learning technological tools of online learning during Covid-19 pandemic (Pittaway & Malomo, 2021; Luo et al., 2021; Shadiev & Yang, 2020). This novel virus affected both the teachers who are not fully prepared to online teaching (Almekhlafi, 2020; Öztürk, 2021) and students (Luo et al., 2021).

Most of the studies highlighted the preference of in-print books as compared to e-books among university students (Luo et al., 2021; Pittaway & Malomo, 2021; Shadiev & Yang, 2020; Myrberg & Wiberg, 2015). Some of them are collective studies and surveys that range within five to ten years. Lou et al. (2021) investigated the use of e-books as an unavoidable alternative for the advancement of online learning and teaching. Pittaway and Malomo (2021, p. 8) stated, “[o]ur research, like countless other studies, indicates a preference for print books over e-books by students” despite the relatively high score for e-books. Myrberg and Wiberg (2015) investigated several studies conducted to identify factors affecting reading comprehension on e-books as compared to printed books. Most of the examined studies preferred the printed book to the e-book for several reasons. Some reasons are the discomfort with reading e-books on a screen, lack of availability or even existence of e-books, and some applications of e-reading do not have the features needed to display essential reference points.

In contrast, Myrberg and Wiberg (2015) identified one experimental study that conducted on two groups of students: one used in-print books and the other e-books followed by a comprehension test revealed a preference for e-books. A brainstorming session with the students showed that the features of e-books like “*the texts being shorter and including a better overview, and being enhanced with video, sound, interactive tests and games*” (p. 52) helped the students to achieve high marks. E-books features such as accessibility, usability and availability are the best choices for teachers and learners; yet, they are still a debatable concept in academic, social and health contexts (Pittaway & Malomo, 2021; Kamal et al., 2021).

Though, the change towards e-books is rather gradual and rapid at the same time. Zhang et al. (2020) investigated 52 language-based learning studies in the last decade. These studies indicated positive effect of e-books on language learning. Almunawaroh (2020) adopted the same findings. The researcher analyzed the effectiveness of using e-books in English language teaching (ELT) on articles that range from 2015-2019 to find four positive aspects of utilizing an e-book in ELT. These aspects are the development of a good reading habit, improvement in students’ learning motivation, performance in learning English, level of reading comprehension, and reading speed and learning attitude.

Chen et al. (2021) reviewed research trends in using e-books in EFL education from 2011-2020. The analysis of 53 articles (Web of Science journals) revealed that reading comprehension, teaching/learning strategies and learning engagement were the most key concepts in the selected studies while e-book features have not received much attention. Another trends review conducted by Toyokawa et al. (2020) also revealed similar results and focused on reading comprehension through the decade (2010 – 2019). Preschoolers and elementary school students are the most studied participants in using e-books in EFL education (Chen et al., 2021; Toyokawa et al., 2020).

Furthermore, there are many studies on the pedagogical benefits of integrating e-books into English language learning to improve students’ proficiency (Chen et al., 2020). Lou et al. (2021) also supported the same findings that students have a higher reception of e-books and “*to have definite reading goals, thereby increasing reading frequency*” (p. 3). It is obvious that with recent studies that students appear to be more engaged in “*digital reading for academic purposes*” (p. 3). Moreover, this adoption of e-textbook “*has the potential to change the way people perceive and adopt e-books*” (Hsiao & Tang, 2014, p. 140).

B. TAM and E-Textbook

Hsiao and Tang (2014) investigated students’ behavioral intentions to use e-textbooks in terms of TAM and other intention-based models. TAM proved to be “*adequate predicative behavioral power*” (p. 139). Most of the studies on e-textbooks utilized TAM since it is used in various types of information systems (Hsiao & Tang, 2014; Lethumanan & Tarmizi, 2011). Other studies highlighted the significant impact of TAM constructs on the use of e-books (Smeda et al., 2018). Smeda et al. (2018, p. 250) pointed out that “*TAM factors appeared to have a significant impact on the acceptance of e-book among MAS students at universities in Libya*”.

Lethumanan and Tarmizi (2011) investigated the intentions to use e-textbooks among undergraduates using TAM. Their results revealed that PEOU of e-textbooks is positively affected by its PU, whereas it has no significant impact on attitudes towards using e-textbooks. In contrast, PU has a significant impact on attitudes and intentions to use e-textbooks. Their study also revealed the significant effect of attitude on the intention to use e-textbooks.

Studies in the Arab world are rather limited regarding technology acceptance models and the use of e-books. Al-Suqri (2014) examined the faculty members in Oman acceptance of e-books using TAM. The findings revealed that the participants who perceived that e-books were easy to use used e-books regularly. The variables in the study are gender, age and social sciences and arts compared to other faculties. Another study was conducted by Smeda et al. (2018). They investigated e-book adoption amongst mathematics and statistics students (MAS) in Libya. Their focus was on the factors that may affect MAS students’ acceptance of e-books. These are intrinsic factors that are related to users themselves such as self-efficacy and resistance to change, extrinsic factors that are related to features of e-books, infrastructure of the university, and TAM constructs. Their results revealed that PU has a major impact on affecting students’ attitudes and BIs towards using e-books. Furthermore, PEOU and attitudes are statistically connected. The students, in their study, believe that PEOU of e-books enhances their learning process by utilizing the most of the e-book features. Finally, the attitudes of the students positively affect their BIs towards e-books.

Considering the above review, it is noticeable that both findings of Lethumanan and Tarmizi (2011) and Smeda et al. (2018) are consistent that PEOU has significant impact on PU of using e-books. While Lethumanan and Tarmizi find that PEOU of e-books doesn’t positively affect students attitudes towards adopting e-books, Smeda et al. found that PEOU and students’ attitudes towards using e-books were statistically significant.

Some studies proved that online English language learning is more effective than traditional in-class learning. Supporting this finding, Kamal et al. (2021) investigated the EFL learners’ productivity during Covid-19 quarantine measures. The effectiveness of online English learning is established by students’ tests. They found out that “*the average value for distance learning during COVID-19 appeared to be somewhat higher than for the classroom one*” (p. 7317). Although this study examined EFL online learning in general, one of their tested parameters is the students’ “[a]bility to absorb information by reading and by ear” (p. 7310) during in-class and online learning. These findings are consistent with Bui and Macalister (2021) who studied the role of online extensive reading (ERO) in enhancing the proficiency of EFL learners. Their study revealed positive impact of online reading on students’ reading fluency in English with 20% increase in reading speed. Their study also revealed positive perceptions of EFL students towards

ERO which enhanced their motivation to read. In addition to enhancing their reading fluency, the students' vocabulary knowledge and reading comprehension were also improved.

On the other hand, Shadiev and Yang (2020) reviewed 398 technology-enhanced language learning articles. They found out that English is the most studied language with 267 articles. They also found that e-books are one of the newly searched technologies. Their survey also revealed that most learners still think that reading through an e-book is "unpleasant" regardless of the purpose of reading. Chou (2016) investigated EFL college perceptions of e-books when they read with a purpose to respond to literature and whether these perceptions change over time. The findings indicated that while students value the "intangible nature of e-books", their e-book reading experience is "unpleasant". However, the researcher considered that this initial negative attitude might change over time if these students are provided with time and opportunities to read using e-books.

Despite of the abundance of studies on e-textbook adoption in terms of TAM, few of them are conducted on Arab students and almost none on Arab EFL learners. Furthermore, several studies are conducted on school EFL learners and not university EFL learners. Most of the conducted studies lacked emphasis on e-books features. This study claims to be the first to be conducted on Arab EFL tertiary students during Covid-19 pandemic. Accordingly, the following hypotheses will be tested:

H1: Perceived ease of use significantly affects perceived usefulness of e-Book.

H2: Perceived ease of use significantly affects attitude towards using e-Book.

H3: Perceived usefulness has a significant effect on attitude towards using e-Book.

H4: Perceived usefulness significantly affects intentions to use e-Book.

H5: Attitude has a significant effect on intentions to use e-Book.

H6: The positive effect of proposed determinants on attitudes and intentions are stronger for students with regular using of e-books in compare to students with limited using of e-books.

H7: The positive effect of proposed determinants on attitudes and intentions are stronger for students who studied 3 or more English courses in university in compare to students studied less than 3 English courses.

H8: The positive effect of proposed determinants on attitudes and intentions are stronger for students who are currently studying 3 or more English courses in university in compare to students who are currently studying less than 3 English courses.

III. METHODOLOGY

The researchers adopted a quantitative methodological approach in order to test the research hypotheses. The researchers designed an online self-completion questionnaire using Microsoft form application, in an attempt to understand EFL learners' acceptance of using e-books for learning purposes. The first draft of the questionnaire was first reviewed by three experts in English language teaching for validity. Suggestions from experts were used to draft the final version of the questionnaire. Using online questionnaire in this setting will help to generate data from a large number of participants to explore the students' acceptance of e-book use for learning purposes and to gather the demographic data. The online questionnaire helped to gather a large number of responses in a timely manner. The data collection took place in November and December 2021. The population of the research encompassed all EFL students (1300) at BAU (Jordan). Only email addresses of EFL students were obtained from the information services department, excluding postgraduate students. Five hundred online questionnaires were distributed online via email to EFL students. The number of retrieved questionnaires was 299, while 283 were suitable for statistical analysis.

TAM constructs were adopted in designing the questionnaire. TAM was chosen as it helps in measuring the acceptance of new technologies, which fits our research aims in accepting the use of e-books for learning purposes. The questionnaire is adapted from the previous literature (see Table 1); it consisted of six sections (demographic data, intention to use, PU, PEOU, attitude toward using, and external variables). In the first section, participants were asked to circle their answers. Section two to six used a five-point Likert scale of strongly disagree, disagree, neutral, agree, and strongly agree. The ethical consideration was met despite the low-risk nature of the research, this is in introducing the questionnaire that covered informed consent, confidentiality, voluntary participation and anonymity.

TABLE 1
SOURCES OF ITEMS USED IN THE QUESTIONNAIRE

Sections of the questionnaire	Source
PU	(Al-Suqri, 2014); (Luo et al., 2021)
PEOU	(Smeda et al., 2018); (Al-Suqri, 2014)
Attitudes	(Chou, 2016); (Al-Suqri, 2014)
Intention to use	(Hsiao & Tang, 2014); (Luo et al., 2021)
External Variable	(Kamal et al., 2021); (Shadiev & Yang, 2020)

IV. DATA ANALYSIS AND FINDINGS

A. Analytical Strategy and Statistical Methods

To complete responses analysis, this study made use of statistical package for social sciences (SPSS) version 26 and

structural equation modelling (SEM) approach through AMOS version 23. SEM approach allows for more flexibility and benefits in analyzing data in compare to first-generation techniques (Martínez-López et al., 2013). SEM-AMOS was applied to test the measurement model and the structural model. The quality of the measurement model was examined by evaluating reliability of scales, this was done by applying confirmatory factor analysis (CFA). Meanwhile, the structural model was examined to assess the effect of each causal path in an effort to provide a decision for each proposed hypothesis.

(a). *Responses Gathering and Screening*

Online self-completion questionnaire was used to gather responses from targeted respondents. Data collection was completed in November and December (2021). The researchers received (299) useable responses in total. Data screening was established and patterns in assessments were captured by gathering standard deviation for Likert based responses. It indicated that (16) responses scored std. values equal to zero showing patterns in assessments. Therefore, they were dropped from the sample, meanwhile remaining responses scored high std. values showing that data was free of major patterns. Data was visualized using simple-scatter dot diagram, and no major outliers were seen in the data. The final valid sample consisted of (283) valid responses. Sample size was seen eligible to the requirement of CFA, and the statement ratio suggests that the ratio 10:1 is required for adequate CFA. The instrument has 18 statements, and when considering 10:1 ratio, the required minimum sample size is (180). Hence the sample was satisfying the requirements of CFA.

(b). *Statistical Assumptions*

Before proceeding with analysis; prerequisites were satisfied in dataset. Concerning normal distribution, Sposito et al. (1983) proposed the range ± 2.2 for a normal distribution free of skewness and kurtosis. Referring to results displayed in Table 2, all skewness values fall within the suggested range and approximately were seen close to zero. Kurtosis values were seen also fall within the suggested range, hence, it can be stated that dataset was free of extreme skewness and kurtosis entailing that the use of SEM-AMOS is suitable for dataset.

TABLE 2
DATA NORMALITY USING SKEWNESS AND KURTOSIS (N=283)

Factor	Skewness	Kurtosis
PU	-0.671	0.195
PEOU	-0.472	1.016
Attitude	-0.282	-0.040
Intention	-0.058	-0.748

To assess multi-collinearity problem; suggestions of Pallant (2020) were adopted, and VIF and tolerance values were examined. Referring to results displayed in Table 3, VIF's values were seen fall within [1.081 - 2.096] range below the threshold of (10), further. Tolerances were seen fall within [0.477 - 0.925] range above threshold of (0.10) showing that the issue of multi-collinearity doesn't exist in dataset. Pearson correlations also supported that the dataset is free of multi-collinearity. All factors correlated to each other were significant at (0.01) level, and all correlations were moderate below threshold of ($r= 0.90$).

TABLE 3
RESULTS OF MULTI-COLLINEARITY TESTS (N=283)

Factor	Tolerance	VIF	Pearson correlation		
			1	2	3
PU	0.477	2.096	1		
PEOU	0.925	1.081	0.723	1	
Attitude	0.880	1.136	0.346	0.274	1

** Correlation is significant at (0.01) level

(c). *Sample Demographics*

Counts and percentages were gathered for our sample and displayed in Table 4. Out of 283 respondents 23.3% were males, and 76.7% were females. In terms of education: 80.2% of the sample were studying for their bachelor degrees, 19.4% of the sample for their diploma degrees, and 0.4% for their master degrees. As for studying year, more than half of respondents 62.5% were at their first year, 23.3% were at their second year, 8.5% were at their third year, 5.3% were at their fourth year, and 0.4% were at their sixth year. Respondents were from both scientific and humanities colleges; however, the majority of the sample were from Humanities colleges entailing a possible limitation for our sample: 14.8% of respondents were from scientific colleges, and 85.2% of respondents were from humanities colleges.

Concerning the extent of reading e-books: 38.9% of respondents rarely read e-books, 25.4% of respondents frequently read e-books, and 35.7% regularly read e-books. Regarding the number of finished English courses at university: 37.1% of respondents finished 1 course, 27.2% of respondents finished 2 courses, and 35.7% finished 3 courses or more. Finally, for the number of current English courses at university: 38.2% of respondents have 1 course, 17% of respondents have 2 courses, and 44.9% of respondents have 3 courses or more.

TABLE 4
SAMPLE DEMOGRAPHICS (N=283)

Demographic	Subset	Count	%
Gender	Male	66	23.3%
	Female	217	76.7%
	Total	283	100%
Education	Diploma	55	19.4%
	Bachelor	227	80.2%
	Master	1	0.4%
	Total	283	100%
Studying year	First year	177	62.5%
	Second year	66	23.3%
	Third year	24	8.5%
	Fourth year	15	5.3%
	Fifth year	--	--
	Sixth year	1	0.4%
Reading e-books frequency	Total	283	100%
	Rarely	110	38.9%
	Frequently	72	25.4%
	Regular	101	35.7%
College	Total	283	100%
	Scientific colleges	42	14.8%
	Humanities colleges	241	85.2%
Finished English courses at university	Total	283	100%
	1 course	105	37.1%
	2 courses	77	27.2%
	3 courses or more	101	35.7%
Current English courses at university	Total	283	100%
	1 course	108	38.2%
	2 courses	48	17%
	3 courses or more	127	44.9%
Total	283	100%	

B. Descriptive Analysis

Results displayed in Table 5 showed that mean values for all factors were above 2.34 suggesting a moderate level of agreement proposed by respondents toward all factors, and entailing that those respondents gave positive assessment to all measured items. In fact, despite the positive agreement proposed by respondents, it is vital to note that the respondents perceived that e-books provide a moderate level of usefulness and ease of use in relation to academic proposes. This entails the necessity of establishing sophisticated online libraries that provide students with useful text books along with online reading systems that are easy to navigate and use.

Further, respondents have moderate level of attitudes toward using e-books and have also moderate level of intentions to continue using e-books. The findings evenly demonstrate that the surveyed students were still not that into orienting toward using e-books despite the forced transformation imposed by the pandemic; this demonstrates the necessity for future studies to investigate factors that still hinder students' orientation toward e-books. Standard deviations were below (1) for all factors suggesting that the assessments were spread around the mean except for intention factor that scored a std. value above (1) showing that assessments were spreading away from the mean. This entailed that the disagreement among respondents was seen in relation to students' intentions.

TABLE 5
DESCRIPTIVE STATISTICS (N=283)

Factor	Mean	Level	Std.	Minimum	Maximum
PU	3.49	Moderate	0.77	1.00	5.00
PEOU	3.47	Moderate	0.73	1.00	5.00
Attitude	3.36	Moderate	0.92	1.00	5.00
Intentions	2.94	Moderate	1.07	1.00	5.00

C. SEM Analysis

SEM analysis was conducted to assess the measurement model and evaluate the structural model. Measurement model was evaluated by employing CFA that involved examining reliability and validity of the proposed model. Meanwhile the structural model was evaluated to test the hypotheses.

Step 1: Analysis of Measurement Model

Analysis of the measurement model was conducted using CFA based on AMOS. Maximum-likelihood estimation approach was used to estimate model's parameters (Hair et al., 2018). In assessing goodness-of-fit, the following fit indices were considered: CMIN/ DF [χ^2] < 3 good, Comparative Fit Index (CFI) > 0.95, Goodness of Fit (GFI) > 0.95, Standardized Root Mean Residual (SRMR) < 0.09, Root Mean Square Error of Approximation (RMSEA) < 0.05 good, < 0.10 moderate, and PClose > 0.05, suggestions of (Hair et al., 2018; Rex-Kline, 2015) were adopted.

Table 6 gathered model fit for original and revised measurement model. The initial examining for measurement

model showed poor fit; therefore, many revises were conducted to improve fit level. We adopted minimum level for factor loading (FL= 0.50). Modification indices and standardized residual co-variances were also examined to revise the model. Revising the model dropped 5 items: (Usefulness_5, Ease_6, Ease_2, Usefulness_4 and Usefulness_6) and two modification indices were correlated, the revised model revealed a better fit with data.

Psychometric properties of the model were evaluated through Cronbach alpha and composite reliability [CR] values. Hair et al. (2018) suggest that Cronbach alpha and CR should be above 0.7 to establish good reliability. All factors except Attitude scored Cronbach alpha and CR above 0.7 suggesting that factors had adequate reliability and validity except for Attitude factor as Cronbach alpha and CR were below 0.7 showing a limitation for this factor. However, no revise can be conducted as the factor has two items only; therefore, future studies should consider revising the scale. Cronbach alpha and CR values were as follows: PU [0.866/ 0.866], PEOU [0.816/ 0.826], Attitude [0.544/ 0.549] and Intention [0.886/ 0.857]. See Table 7 for Cronbach alpha and CR values.

TABLE 6
MODEL FIT FOR ORIGINAL AND REVISED MEASUREMENT MODELS

Model	CMIN/ DF	CFI	GFI	SRMR	RMSEA	PClose
Original	3.311	0.887	0.847	0.887	0.091	0.000
Revised	1.173	0.995	0.963	0.033	0.025	0.977

TABLE 7
CRONBACH ALPHA AND CR VALUES (N=283)

Factor	Cronbach alpha	CR
PU	0.866	0.866
PEOU	0.816	0.826
Attitude	0.544	0.549
Intentions	0.886	0.857

Step 2: Analysis of Structural Model

Path analysis was employed to test the structural model. Testing structural model allows for examining relationships between exogenous and endogenous variables. Path coefficients (β) were gathered to determine the amount of change in Attitude and Intention along with *P* values. The path coefficient (β) of TAM has a highly statistical significant level in the studies related to “the domain of students’ behavioral intention to use e-textbooks” (Hsiao & Tang, 2014, p. 156). Prediction level of the model was assessed through coefficient of determination R^2 . For PU ($R^2= 39\%$), Attitude ($R^2= 12\%$) and for Intentions ($R^2= 49\%$) showing a good prediction level by the proposed factors. Figure 2 displayed structural model testing to test proposed hypotheses.

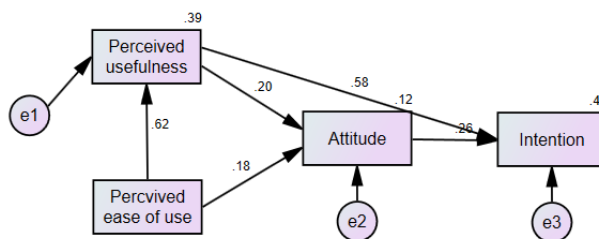


Figure 2: Path Analysis for Structural Model

H1: Perceived ease of use significantly affects perceived usefulness of e-Book. PEOU scored a significant positive influence on PU [$\beta= 0.62, P= 0.000$], indicating that for each one unit increases in PEOU, PU increases by 62%. Findings support H1.

H2: Perceived ease of use significantly affects attitude towards using e-Book. PEOU scored a significant positive influence on Attitude [$\beta= 0.18, P= 0.012$], indicating that for each one unit increases in PEOU, Attitude increases by 18%. Findings support H2.

H3: Perceived usefulness has a significant effect on attitude towards using e-Book. PU scored a significant positive influence on Attitude [$\beta= 0.20, P= 0.005$], indicating that for each one unit increases in PU, Attitude increases by 20%. Findings support H3.

H4: Perceived usefulness significantly affects intention to use e-Book. PU scored a significant positive influence on Intention [$\beta= 0.58, P= 0.000$], indicating that for each one unit increases in PU, Intention increases by 58%. Findings support H4.

H5: Attitude has a significant effect on intention to use e-Book. Attitude scored a significant positive influence on Intention [$\beta= 0.26, P= 0.000$], indicating that for each one unit increases in Attitude, Intention increases by 26%. Findings support H5.

TABLE 8
SUMMARY OF PATH ESTIMATES (N=283)

H	Path	β	Decision
H1	PEOU \rightarrow PU	0.62*	Supported
H2	PEOU \rightarrow attitude	0.18*	Supported
H3	PU \rightarrow attitude	0.20*	Supported
H4	PU \rightarrow intention	0.58*	Supported
H5	Attitude \rightarrow intention	0.26*	Supported

* Significant at level ($\alpha \leq 0.05$)

D. Testing MGA

This study provides an attempt to extend TAM by incorporating demographics as moderators into the model. To test the moderation effect, multi-group analysis (MGA) was established. This analysis establishes an influence based on two groups. Therefore, demographics were categorized into two groups and the results were as follows:

H6: The positive effects of proposed determinants on attitudes and intentions are stronger for students with regular use of e-books compared to the students with limited use of e-books. MGA was employed, and the two models for regular vs. limited (Rarely + Frequently) users reported nearly the same results. Only marginal changes in path coefficients were seen donating no significant differences. This result was supported by Chi-Square test that compared the two models as reported $X^2 = 2.812$ with a significance value ($P = 0.590$) exceeding threshold (0.05), indicating that the two models are not significantly different at the model level. Previous results render no support for H6.

H7: The positive effects of proposed determinants on attitudes and intentions are stronger for students who studied 3 or more English courses in university compared to students who studied less than 3 English courses. MGA was employed, and the two models for less than 3 courses vs. more than 3 reported slight changes in path coefficients. Result by Chi-Square test that compared the two models reported $X^2 = 10.910$ with a significance value ($P = 0.028$) not exceeding threshold (0.05), indicating that the two models are significantly different at the model level. Previous results support H7.

H8: The positive effects of proposed determinants on attitudes and intentions are stronger for students who are currently studying 3 or more English courses in university compared to students who are currently studying less than 3 English courses. MGA was employed, and the two models for less than 3 current courses vs. more than 3 current courses reported slight changes in path coefficients. Result by Chi-Square test that compared the two models reported $X^2 = 11.026$ with a significance value ($P = 0.026$) not exceeding threshold (0.05), indicating that the two models are significantly different at the model level. Previous results support H8.

V. DISCUSSION, IMPLICATIONS AND CONCLUSION

This study employed TAM to investigate determinate factors for e-book use by EFL students during COVID-19 pandemic. Online survey was used, and 283 valid responses were gathered from students. SEM-AMOS was applied to complete the analysis, and gathered findings provided contribution to the robustness of TAM in exploring determinate factors. Based on the findings, seven hypotheses (PEOU \rightarrow PU, PEOU \rightarrow Attitudes, PU \rightarrow Intentions, PU \rightarrow Attitudes, Attitudes \rightarrow on Intentions, Intentions and Attitudes \rightarrow 3 or more English studied courses, Intentions and Attitudes \rightarrow 3 or more English currently studying courses) were supported. While H6 (Intentions and Attitudes \rightarrow regular use of e-textbooks) was not supported.

From the results of descriptive analysis, one can conclude that students perceived that e-book using allowed for moderate level of usefulness. Moreover, ease of use was also to moderate level for e-book use. These result were in agreement with Davis (1989) and Lethumanan and Tarmizi (2011) who stated that “perceive[d] ease of use play important role in making the e-book to be perceived as useful” (p. 523). EFL learners’ attitudes and intentions also perceived e-books as useful. This result was in consistent with Semda et al. (2018, p. 250) who stated that PU played an important role in affecting attitude towards adoption of e-book and students’ BIs to use e-book.

The findings of our study that were related to the significant effect of PEOU on PU towards adoption of e-textbooks were supported by Lethumanan and Tarmizi (2011) and Smedi et al. (2018). While the positive effect of PEOU on attitudes towards using e-textbook was supported by Smedi et al., it was opposed by Lethumanan and Tarmizi. Still, EFL learners who regularly use e-books did not have positive attitudes and intentions towards using e-books which meant that they did not find them useful or easy to use. This result was inconsistent with Al-Suqri’s (2014) result that participants who used e-books regularly perceived that e-books were easy to use.

H7 and H8 were also supported by the findings. They indicated that students who studied or were studying three or more English courses had positive attitudes and higher intentions towards using e-books if compared to those who studied less than three. This pointed out the significant role of English language courses that were offered for students at the university. These findings were inconsistent with Chou (2016) and Shadieff and Yang (2020) whose participants perceived reading e-books as an “unpleasant” experience despite the value of the “intangible nature of e-books.” However, the same findings were in agreement with Bui and Macalister (2021) and Kamal et al. (2021). We could conclude that as long as EFL learners’ attitudes had positive effect on their intentions to use e-books, they perceived e-books use as useful and easy to use. Students appeared to respond positively to the features of e-books. This could be

attributed to the English e-books characteristics that students studied online during the lockdown preventive measures of Covid-19 pandemic. The general English courses at BAU were introduced through Cambridge Learning Management Systems (CLMS). Some of these e-books features were the assigned audio-visual icons and the interactive activities (online workbook).

This evidently required the attentions of e-books providers who ought to focus on the features of e-textbooks like notetaking, highlighting and dictionary check. Moreover, universities' libraries and instructors should provide and refer to the sophisticated easy navigate e-textbooks applications and the digital references databases. In an era of pandemic, partial/full closures imposed social distance and online learning /teaching. As a result, it was vital to provide students with all required materials online and to revise academic plans to include more English courses.

Moreover, the attitudes of the students towards using e-books had significant positive influence on their intentions to use e-books. The same finding was supported by Bui and Macalister (2021) . In fact online learning is not about just using internet mechanisms to communicate, it's about moving knowledge transformation to digital space, so that students can take the same benefits compared to the traditional learning. Therefore, online libraries should be able to provide students with required books that contribute to their education. Moreover, the technical aspect should also be considered. Web and app developers should consider designing sophisticated interfaces that allow students to customize and navigate through text books easily.

This study brings new knowledge to the literature related to English teaching by the embodiment of the TAM with e-books use and reading habits. Also, technology, as electronic books, should be used in all classrooms to support literacy learning as the result of the study showed high intentions by students to use e-books. Our study was limited in its geographical context because the sample was taken from one university in Jordan, and it was targeting EFL students. Future studies should consider EFL students in all Jordanian universities to have more generalizable results. In addition, future studies should also consider exploring other factors that can extend TAM to provide more comprehensive addressing for factors that determine students' acceptance of e-books.

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