Antecedents of Business Students' Acceptance of Digital Learning Platforms Post COVID-19: An empirical study on interactive digital learning systems

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Abstract

As a result of the COVID-19 pandemic, students worldwide are required to interact heavily with different digital learning platforms. In this case, it's important to investigate how the university students perceived and accepted these platforms. This study is guided by the technology model and the service quality model, aimed at investigating the relationship between quality variables, teaching team roles, and perceived usefulness in learners' usage behavior of digital textbook learning systems. The study was conducted on digital learning platforms initiated in 2021 at the British University in Egypt. It employed a survey approach to explore the relationships between perceived usefulness, the role of perceived quality for both rigid and flexible contents, instructor involvement, and business students' continuation of usage of these platforms. The main scales were initially extracted from the literature and modified to fit the educational technological facilities and departmental faculty structures in the university. The questionnaires were distributed

to a sample of 2500 students, and 577 completed questionnaires were collected with a response rate of 23%. The structural equation modeling utilized demonstrated a positive direct association between perceived usefulness and continuous usage, demonstrating that students' opinions of digital content's utility influence continuous utilization. Furthermore, both rigid and flexible content quality have a considerable impact on predicting students' perceptions of usefulness and influencing platform utilization over time. To summarize, digital platform institutions should invest in training and partner with educators to provide digital textbooks or resources that will help teachers achieve their learning objectives.

Keywords: teaching team role, flexible content quality, rigid content quality, perceived usefulness, continuous usage

Introduction

The COVID-19 pandemic is an unbeatable disaster that has caused fundamental changes in countries throughout the world. It poses the most significant danger to the human race in the new millennium. To minimize the impact of the epidemic and the lockdown on higher education, educational institutions have started to depend totally on the digital or electronic learning platforms (Wargadinata et al., 2020). These digital or electronic learning platforms provide infographics and video so students "can engage with such textbooks, respond, create, negotiate, co-

construct and share with other members of the learning community" (Knight, 2015). Furthermore, these platforms can be used inside and outside the classroom setting (Gu et al., 2015). Using these platforms outside the classroom setting may affect negatively the way to monitor the students' performance during and after the lectures. Additionally, we faced other identified obstacles while using these platforms, such as technology and copyright concerns, up-to-date information, and multimedia-based learning. Also, learners need to be trained to learn using such systems, and they need to be motivated for participation in the learning process with digital platforms (Bikowski & Casal, 2018).

In addition to the challenges encountered in the use of digital learning platforms, a recent breakthrough on the origin of the COVID-19 pandemic emphasizes the demand for studies to investigate how university students understood and embraced these platforms during and after the outbreak. In concern, many scholars have focused on exploring many linked antecedents to the perceived value of online learning effectiveness (Baber, 2020; Baber, 2021; Li et al., 2020; Su & Guo, 2021; Saxena el al., 2020: Wargadinata et al., 2020; Yan et al. 2019). However, it is still important to understand to what extent do the students learn from these integrated platforms and the reasons behind their acceptance of the digital learning platform. After all, students' overall acceptance to interact successively with the platforms will

reflect the quality of education and the students' performance as an engaging educator.

To fulfil the lack of evidence and the research gap, the current study proposed a new model to examine the antecedents of students' acceptance of digital learning platforms during, and tested in the Egyptian context with students from the British University in Egypt. To answer the following questions:

- What are the main antecedents behind the Egyptian Universities students' antecedents to accept the digital learning platforms as a learning tool?
- How the identified antecedents predict the students' acceptance rate?

Literature review

The terms "blended learning" and "hybrid learning" are used interchangeably (Ryan et al., 2016), and blended learning is defined as integrating two separate models of learning: traditional face-to-face learning systems and distributed learning systems (Bernard et al., 2004). Other studies have agreed that blended learning is definable according to the relative time spent online and in face-to-face instruction, which constitutes at least 50% of in-class components in blended learning (Bernard et al., 2014). The literature has explored blended learning's effectiveness. Many studies have shown that students adopting blended learning education have shown better outcomes than those in traditional instruction programs. Integration of technology in

blended learning courses seems to achieve very slow, although significant, improvements in students' achievement, especially in technologies that yield cognitive support (ex: simulations) or facilitate students' interaction (Bernard et al., 2014). A study that used the flipped-classroom model of blended learning in a science course showed that blended solutions resulted in higher results than traditional face-to-face classroom settings (Gomez et al., 2016). Other studies, however, have shown the exact opposite (Adams et al., 2015). In a microbiology module, students were less successful than their peers adopting the face-to-face setting. Such students' performance was ascribed to less interaction with materials or a sense of isolation resulting from less class attendance. Similar results were found in a psychology course (Powers et al., 2016). In conclusion, blended-learning opportunities can be successful in contexts that enhance technological advances and multidisciplinary knowledge about academic content (Ryan et al., 2016).

In many contexts, the evolution of Internet-based applications has facilitated blended-learning practices like e-learning, a tool adopted in blended learning. E-learning is a method of learning that either fully or partially signifies the education model used by exploiting electronic media and device tools for enhancing the availability of training, communication, and integration, which aids acceptance of new ways of comprehending and establishing learning (Masiello, Ramberg &

Lonka, 2005; Lim & Morris, 2009). Liaw (2008) emphasizes that use of technologies and media is the main enhancement in e-learning, which has many advantages, for example, inducing community spirit among learners while also establishing students' independent learning. However, e-learning is not optimum for student–instructor interactions. Additionally, feedback from peers and collaborative activities assessment are unstructured and less formal, and e-learning provides opportunities for interference from the alumni community.

Then came the latest innovation of digital learning platforms, digital textbooks for which many terms are used, for instance, digital textbook, electronic textbook or e-textbook (Choi et al., 2011; Daniel & Woody, 2013; Kim et al., 2010, 2013; Liu, 2012; Luik & Mikk, 2008; Rockinson-Szpkiw et al., 2013; Weisberg, 2011). E-textbook platforms have evolved due to widespread use of personal devices as learning platforms (Chan, 2010). An e-textbook is considered a platform that combines e-learning and e-publishing technologies, in addition to interactive reading and learning activities among learners and the learning community. Use of e-textbooks has been anticipated because of its flexibility, accessibility, interactivity, and extensibility (Daniel & Woody 2013, 2008 a, b; Woody et al., 2010). Still, the use of e-textbooks has not risen to its anticipated level relative to the use of other technologies. This is ascribed to the lack of standards for learning content, in addition to functions

and barriers in the use of e-textbooks. Last, e-textbooks' effect on the learning process has not yet been clarified.

E-learning and e-textbooks are considered information technologies dedicated to the educational process. Currently, they follow theories related to behavior toward information systems, such as the information system (IS) success model and the technology acceptance model (TAM). The IS model was originally developed in 1992. Due to innovations in Internet-based technologies, Delone and Mclean (2003) proposed an updated IS success model and evaluated its validity for e-commerce applications. This updated model emphasized service quality measures and grouped its impact on others through another measure called net benefits. This model is a composite of several variables: information quality, system quality, service quality, use, user satisfaction, individual impact, and organizational impact. System quality and information quality both directly affect usage and satisfaction.

The technology acceptance model (TAM) was originally proposed in 1989 to explain acceptance or rejection of information technology (Davis et al., 1989). The TAM theorized that the two main reasons for technology acceptance are its perceived usefulness and perceived ease of use. Perceived usefulness is defined as the degree that certain technology enhances performance, and ease of use refers to the effort needed to apply a certain technology. Since 1989, many factors have

been added. In a follow-up study Venkatesh et al. (2003) integrated the TAM with the theory of planned behavior, social cognitive theory, and motivation theory to develop a unified theory of acceptance and use of technology. Many studies have been conducted on new technologies in education, and the literature has investigated both models to interpret each one's usage behavior. Therefore, this study tests variables of the IS model and the TAM as reasons for adoption of e-textbook platforms. IS variables representing information and service quality in addition to perceived usefulness and the teaching team role as determinants of e-textbooks' adoption.

Perceived Usefulness

The literature has explored factors affecting users' behavior in applying e-learning technologies (Liaw, 2008; Liaw et al., 2007; Selim, 2003), and many of those factors were extracted from technology acceptance models (Davis, 1989), which, in turn, were developed from the theory of reasoned action (Fishbein, 1980). According to the TAM, acceptance of e-learning could be deduced from perceived usefulness, which Davis (1989) defined as the degree to which individuals believe a system enhances their job performance. Perceived usefulness is a main variable in both the TAM and the continuous use model (ECM). In both these models, perceived usefulness has a direct effect on the outcome (i.e., adoption or continuance use) and an indirect effect via affective components (i.e., attitudes about the

TAM and satisfaction in the ECM). It is, therefore, not surprising that many researchers increasingly reveal perceived usefulness as a key factor in the adoption and continuous usage of information systems (Cheng & Yuen, 2018). While some researchers showed that perceived usefulness was the most crucial of behavioral intentions to adopt e-books and using the online digital platforms (Al-Fraihet et al., 2020), others (e.g., Letchumanan & Muniandy, 2013; Terpend et al., 2014) did not provide support for this association, thus suggesting the possibility of boundary conditions on the influence of perceived usefulness both for information systems in general and for adoption of e-books. As a result, this study considers the following:

H1: Perceived usefulness has a positive direct effect on continuance usage of digital textbook platforms.

Perceived quality of educational outcomes

As mentioned in the IS success model, the three dimensions of quality are system quality, information quality, and service quality. Information quality can be jointly determined by information source and content. Alternatively, information quality is the extent to which users think the information is relevant, timely, and accurate. It simply evaluates features of content involved in the medium. It also refers to users' belief regarding the information provided on e-learning completion and accurateness. Previous research has emphasized the importance of information quality on users' online behavior (Saeed et al.,

2003), also associated with system use (Rai et al., 2007). In a study on acceptance of massive open online courses (MOOC), information quality has been replaced by course quality, which was tested as a composite of the lecturer's knowledge, the course content's authority, and teaching attitudes. Course quality has been shown to have a strong effect on MOOC adoption (Yang et al., 2017). That was expected because perceived course quality increases learners' willingness to perceive the system more useful. Li et al. (2012) found that course quality positively enhances the behavioral intention to reuse e-learning systems. In addition, several studies confirm the significant effect of course quality on e-learning systems' perceived usefulness (Cheng, 2011; Calisir et al., 2014). Furthermore, many studies have confirmed the relationship between information quality and perceived usefulness. A study by Elsabawy et al. (2016), exploring factors affecting perceived usefulness of an e-learning system, tested the IS success model's quality variables. Researchers concluded a direct relationship between system and information quality from the IS success model on perceived usefulness in the absence of a service delivery quality variable. However, in the presence of service delivery quality, no direct relationship was observed between system and information quality, indicating full mediation of service quality for perceived usefulness. In another recent study (Lee et al., 2018), information quality was anticipated in a different context, that is, considering

the course's requirements and planned activities. The instructor in this course, a hospitality course, used a pre-set number of videos that cannot be altered, considering its rigid content and testing its quality through the videos' content length and the instructor-provided materials.

Another form of quality is service quality, defined as the quality of interface between instructor and learner. Tools were designed to facilitate learners' objectives and execution of such objectives as tests, and assignments. Both types of quality impacted learner satisfaction and retention. Consequently, flexible contents are represented with tests, assignments, and discussion that can be easily manipulated by instructors based on student needs or situations, while rigid content is a set of information, including content on e-learning media directed toward specific learning outcomes (Harding et al., 2005). As previous literature illustrates, quality dimensions vary depending on the educational technologies used, and they affect behavioral intentions and perceived usefulness. In the current study, e-textbooks had fixed text material that cannot be altered, in other words, an e-book or e-text with interactive facilities. Furthermore, the instructor is provided with the ability to prepare tests, activities, and assignments similar to the flexible content quality mentioned in Lee et al. (2018). Given this background, researchers conclude the following:

H2: Rigid content quality significantly influences perceived usefulness.

H3: Flexible content quality significantly influences perceived usefulness.

H4: Rigid content quality significantly influences continuous usage.

H5: Flexible content quality significantly influences continuous usage.

Teaching Team Role

Several studies have indicated the importance of educators in addition to course content as a means of successful online student engagement and learning (Moore, 2014; Swan & Shih, 2014). An educator presence can be achieved in multiple ways through regular communication with students, consistent feedback, and critical discourse modeled by the educator and other students (Southward et al., 2015; Rodriguiz, 2015) in an environment in which educators strategically combine audio and video, synchronous and asynchronous discussion, and practical activities (Gray & Diloreto, 2016). In e-learning, an instructor has a major role in the success or failure of achieving its objectives (Khan, 2005). Instructor contribution is emphasized through instructional application of technology that affects the success of the learning process. In a recent study by Lee et al. (2018), the IS success model was tested. Rigid contents, quality represented by system quality, and flexible contents were

investigated to explore effects on learners' satisfaction. The model was further extended through the instructor's involvement as a moderating factor. Instructor involvement was defined as the personal interest and the perceived crucially of the e-learning system to the instructor. The instructor was categorized as high or low involvement. Both flexible and inflexible contents did affect learners' satisfaction without the moderation effect of instructor involvement. However, in including the moderating effect of instructor involvement, the relationship between flexible and rigid content quality was further enhanced by instructor involvement in learners' satisfaction.

Recently, a case study (Lindqvist, 2019) was conducted on the number of secondary school teachers to access their interaction and their role in digital textbooks. First, instructors' capabilities in applying activities in a normal classroom setting affected & supported implementation of a digital textbook platform (Horsley & Martin, 2015; Kim et al., 2012). Students in this study were found to need their teachers when working with e-textbooks. Additionally, in conducting individual or collaborative work, creating teaching-enabled learning is important. Moreover, instructors' time investment in the e-textbook and its resources is crucial in such textbooks' adoption. Along with that, being professional in using such technologies encourages learners' continuous usage. Finally, instructors' motivation to use e-textbooks reduces students' distraction when

they use tablets or laptops for purposes other than education (Håkansson Lindqvist, 2019). From previous literature, clearly, instructors have many roles that affect the teaching outcome through their efforts in the learning process. Thus, the researcher deduced the following:

H6: Teaching team role has a positive effect on rigid content quality.

H7: Teaching team role has a positive effect on flexible content quality.

Research Methodology

Table 1 Descriptive Analysis

Characteristics	Frequency	Percentage
Department		
1- Business	501	88%
2- Economics	23	4%
3- Political science	45	7%%
Academic year		
1- Prep year	358	63%
2- 1st year after Prep	185	32.5%
3- 2nd year after Prep	26	4.5%
grade point average (GPA)		
1- Excellent (A)	192	33.7%
2- Very Good (B)	212	37.3%
3- Good (C)	135	23.7%
4- Fair (D)	30	5.3%
Usage		
1- Once per week	116	20%
2- Twice per week	97	16.8%
3-Three times per week	106	18.4%
4- More than three times per week	247	42.8%
5-None	11	2 %

Survey and data description

Administered online in 2019, through the "Kwik" Survey application, this study's survey was completed by 599 students in the British University in Egypt in the faculty of BAEPS. The survey link was distributed through e-learning pages of various courses using interactive systems by Mcgraw Hill learning systems, Pearson learning systems, and Cengage learning systems; teaching staff urged students to complete the questionnaire. As a result, the survey was distributed equally among all users, thus using random probability sampling, which has advantages in time and cost saving (Kim et al., 2016; Sudman et al., 1996).

The demographics measured for this survey related to usage, grade point average (GPA), and cohort year. As for usage, almost 43% of students used the system more than three times per week. Thus, most users were involved in the system and its activities, and most of those had A or B GPAs (70%). Finally, most users were first- and second-year students, especially since the system is applied in the majority of those years' modules (90%). Moreover, Table 2 shows this study's measurements for all variables: perceived usefulness (PU), teaching team role (TT), rigid content quality (RCQ), flexible content quality (FCQ), and usage intention (UI)

Table 2 Measurements

Variables	Measurement	Scale	Source
Perceived usefulness (PU)	PU1: By using the interactive system, it is easier to accomplish the assignments.	Likert, 5-point scale	(Davis, 1989; Lee, Cheung, & Chen, 2005; Ngai et al., 2007; Ong et al., 2004; Saadé & Bahli, 2005; Selim, 2003)
	PU2: I am able to learn how to make good use of the interactive system.		
	PU3: By using the interactive system, I can improve my learning in the subject.		
	PU4: By using the interactive system, I can upgrade the efficiency of my study.		
	PU5: The interactive system provides some good functions to help me complete my learning tasks.		
	PU6: By using the function of the interactive system, I can concentrate more on my other studies.		
Teaching team role (TT)	TT1: The teaching team reminds students to use the interactive system during the whole semester.	Likert, 5-point scale	(Delone & Mclean, 2003)
	TT2: The teaching team notify students with assignments or activities dates and deadlines on the interactive system.		
	TT3: The teaching team assists students in any problem they face on the interactive system.		
	TT4 The teaching team motivate students to use the interactive system.		
Rigid Content quality (RCQ)	RCQ1: The E-Book or Smart book was easy to use.	Likert, 5-point scale	(Delone & Mclean, 2003)
	RCQ2: The E-Book or Smart book provided many examples and insights that helped in understanding the topics.		
	RCQ3: The E-Book or Smart book used were interesting to read and apply		
Flexible content Quality (FCQ)	FCQ1: The assignment was suitable for evaluating my understanding in the subject.	Likert, 5-point scale	(Delone & Mclean, 2003)
	FCQ2: I have enough time to finish the assignments.		
	FCQ3: The assignments or activities were helpful in understanding the lectures.		
	TFCQ4: The assignments or activities were manageable in difficulty.		
Continuous usage	UI1: I intend to use the interactive system in the next semester if available.	Likert, 5-point scale	(Davis, 1989; Lee, Cheung, & Chen, 2005; Ngai et al., 2007; Ong et al., 2004; Saadé & Bahli, 2005; Selim, 2003)
	UI2: I will use the interactive system on a regular basis in the future.		
	UI3: I plan to use the interactive system during the next semester, if available.		

Data Analysis

Reliability and validity of the model

The statistical Excel micro enabled package and Amos 19 software were used to analyze measurement items' reliability and validity (Tables 3, 4). The Cronbach's alpha was more than 0.7 for all constructs, which is the minimum acceptable reliability measure (Hair et al., 2012). Exploratory factor analysis was first determined and then used to develop confirmatory factor analysis (CFA). CFA values were exploited to extract C.R. and AVE values to test their convergent validity. In CFA analysis, all factor loadings exceeded the minimum requirement of 0.6, confirming convergent validity (Anderson & Gerbing, 1988). For each construct, the C.R. was more than 0.7, which is valid (Sharma, 1995; Hairetal, 2012). Finally, the AVE for each construct was greater than or equal to 0.5, further confirming satisfactory convergent validity (Fornell & Larcker, 1981).

Table 3 Validity and Reliability

Construct	Item	Standardized loading	AVE	C.R.	Alpha
	PU2	.799			
	PU3	.866			
	PU4	.939			
	PU5	.702			
PU	PU6	.742	.629	.910	0.907
	TT1	.864			
	TT2	.877			
	TT3	.675			
	TT4	.768			
TT	TT5	.745	.575	.844	0.886
	RCQ1	.836			
	RCQ	.714			
RCQ	RCQ2	.785	.667	.857	0.872
	FCQ1	.598			
	FCQ2	.702			
	FCQ3	.594			
FCQ	FCQ4	.848	.5	.731	0.801
	UI1	.878			
	UI2	.858			
UI	UI3	.730	.825	.934	0.71

As shown in Table 3, this study model has acceptable discriminant validity. As for model fit statistics, the measurement model fit was revised based on general guidelines suggested by Segars (1997) and Byrne (1998). The model then showed acceptable fit. Table (4) displays model fit indices and their recommended values.

Table 4 Model fit for Initial Model and Result Model

Model goodness—fit index	Recommended value	Initial model	Result model
Chi-square/df	≤5.0	2.435	2.856
Goodness of Fit Index (GFI)	≥0.8	0.939	0.926
Adjusted goodness of Fit index (AGFI)	≥0.8	0.918	0.904
Root mean square error of Approximation (RMSEA)	≤0.06	0.05	0.057
Normalized fit index (NFI)	≥0.9	0.95	0.94
Non-normalized fit index (TLI)	≥0.9	0.964	0.953
Comparative fit index (CFI)	≥0.9	0.97	0.96
Incremental fit index (IFI)	≥0.9	0.97	0.96

Structural Equation Modeling

Fig. 1 illustrates results of structural model analysis including standardized path coefficients and each path's statistical significance. In this study, the research model's fit was tested, and nine indices were measured: $\chi 2/df$, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index

(NFI), non-normed fit index (NNFI), comparative fit index (CFI), incremental fit index (IFI), RMSEA (root mean square error of approximation), and SRMR (standardized root mean square residual). As shown in Table 5, the $\chi 2/df.$ was 2.434 and 2.856, satisfying the fit threshold of 5.0 or less, and the CFI, NNFI, and IFI were higher than the recommended minimum value of 0.9. The GFI and AGFI were also higher than the recommended minimum of 0.80. In contrast, the RMSEA and SRMR were lower than the recommended maximum values of 0.06 and 0.09, respectively. Therefore, the research model's overall fit was excellent.

Hypothesis results are displayed in Table 5, and all relationships are statistically significant. Specifically, Hypothesis 6 and 7 showing the relationship between *attitudes of TT* and *RCQ* (β = .625 C.R. = 10.78, $p \leq 0.05$) was supported as it is statistically significant, Similarly, *attitudes of TT's* effect on *FCQ* (β = .681, C.R. = 12.46, $p \leq 0.05$) was supported as it is statistically significant. *RCQ* was an important factor affecting *PU*, supporting Hypothesis 2 (β = 0.489, C.R. = 12.02,$p < 0.05$) and *UI* supporting Hypothesis 4 (β = 0.286, C.R. = 8.64, $p < 0.05$). *FCQ* was an important factor affecting *PU*, supporting Hypothesis 3 (β = 0.379, C.R. = 4.775, $p < 0.05$) and *UI* supporting Hypothesis 5 (β = 0.216, C.R. = 4.423, $p < 0.05$). Finally, Hypothesis 1 (β = 0.216, C.R. = 4.423, $p < 0.05$) is supported, indicating a positive relationship between *PU* and *UI*.

Figure 1 Path Analysis

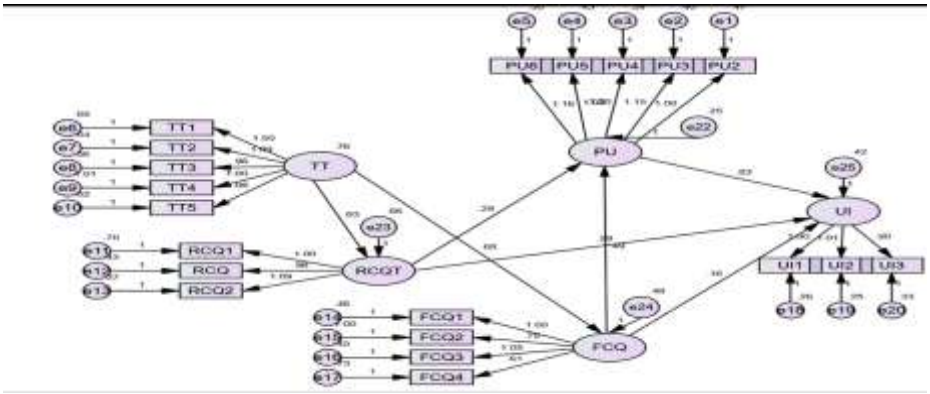

Table 5 Results of hypothesis

Hypothesis	Path	Coefficient	C.R.	P Value	Support
H6	**TT→RCQ**	**0.625**	**10.78**	*******	**Yes**
H7	**TT →FCQ**	**0.681**	**12.468**	*******	**Yes**
H2	**RCQ →PU**	**0.489**	**12.02**	*******	**Yes**
H3	**FCQ→PU**	**0.29**	**8.643**	*******	**Yes**
H1	**PU→UI**	**0.835**	**9.927**	*******	**Yes**
H4	**RCQ→UI**	**0.286**	**6.236**	*******	**Yes**
H5	**FCQ→UI**	**0.164**	**2.753**	**0.006**	**Yes**

As shown in Fig 1, attitudes of TT, RCQ, and FCQ had direct effect in this model, constituting 60% of the variance in PU. Attitudes of TT, RCQ, FCQ, and PU accounted for 67.8% of the variance in usage intentions. This indicates that the model's variables have significant effect on usage behavior and students' perceptions of learning systems' usefulness.

Finally, direct, indirect, and total eff ect analyses are shown in Table 7. Attitude of TT or staff is fully mediated by the

content quality two components on its effect on PU. As a result, attitudes of teaching staff have indirect effect on PU through students' perception of content quality. As for direct and indirect effects of FCQ on usage behavior, we can hypothesize that PU partially mediates the relationship between FCQ and usage behavior. However, the indirect effect of FCQ on usage intentions is higher. Concurrently, we can hypothesize that PU partially mediates the relationship between RCQ and UI. The effects, both direct and indirect, are nearly equal.

Table 6 Table of Indirect Effects

TT effect on perceived usefulness through RCQ and FCQ			
	Total effect	**Direct effect**	**Indirect effect**
RCQ	**.555**	**.555**	**0**
FCQ	**.649**	**.649**	**0**
PU	**.569**	**0**	**.569**
FCQ effect on UI through PU			
PU	**.567**	**.567**	**0**
UI	**.454**	**.130**	**.323**
RCQ effect on UI through PU			
PU	**.362**	**.362**	**0**
UI	**.450**	**.243**	**.206**

Discussion

This study was intended to anticipate the antecedents of using digital learning platforms, especially because digital platforms are accompanying other digital technologies in higher education. A digital platform is mainly a part of digital innovation technologies, and it is considered a convenient solution for many educational institutions in developed economies, in addition to other digital resources. In this study,

variables included the information success model, and the technology acceptance and continuance of use models, both tested to hypothesize their effect on use of digital platforms.

The first hypothesis between PU and continuous usage revealed a positive direct relationship, indicating the influence of students' perception of digital contents' usefulness on continuous usage. This conforms with the literature, which has hesitated to consider its effect on adoption of e-books and their platforms (Cheng & Yuen, 2018; Letchumanan & Muniandy, 2013; Terpend et al., 2014). Then, other variables tested the effect of the quality of content provided by instructors and the TT. Materials provided by instructors involved rigid content, including textbooks' pre-set content, and flexible content, for example, tests, exercises, and activities customized by instructors to fit learning objectives. Both rigid and FCQ has significant effect on predicting students' perception of usefulness and in affecting continuous usage of platforms. As a result, investment in such systems and collaboration to expand choices enhance students' perception of the educational content's usefulness and better engage them in achieving educational objectives. Such results conform with the literature, the IS success model, and the effect of information systems' quality indicators on students' satisfaction and learners' retention. However, most students who responded to this questionnaire have high GPAs, so the role of

such platforms in assisting those with poor GPAs or students with disabilities is not apparent.

Finally, the TT role has been indirectly affecting continuous usage of the system through selection of content and continuing support and motivation for usage of such systems. This follows the literature that confirms instructors' effect in supporting and motivating students to use e-textbooks (Håkansson Lindqvist, 2019; Gu et al., 2015; Joo et al., 2017; Millar & Schrier, 2015; Weisberg, 2011). All the variables are crucial in their effect on continuous usage of the system, as they predicted more than 67% of the variation occurring in the continuous usage variable. As a result, investment in digital content and in training instructors to have the most relevant digital materials in such systems would pay off by more deeply engaging students in such digital platforms.

Limitations and Further Suggestions

This research focused on a specific sample of students in one faculty in the British University. For more generalized results, the study needs to be conducted on more than one faculty and in more than one of the private universities. Moreover, the study was conducted with students and faculty who are relatively new at using publishers' learning systems, so future results might differ with increased usage experience of both faculty and students. Finally, more publisher learning systems need to be

investigated because this study focuses mainly on one publisher learning system.

Conclusion and Implications

Because no previous research has investigated Egyptian undergraduate students, this empirical study has contributed to the literature in regard to understanding factors that determine Egyptian undergraduate students' usage behavior of digital textbook platforms.

Research results showed that all relationships are statistically significant, and the study characterized relationships between TT role, rigid and FCQ, PU, and usage intentions for digital textbooks; rigid and flexible content was an important factor affecting PU. In addition, most variables (rigid and flexible contents, PU, and TT role) affected usage behavior, either directly or indirectly. To conclude, digital platform companies need to invest in training and collaborating with educators to design digital textbooks or resources to assist educators in achieving their learning objectives. Additionally, educational institutions should provide educators with more time and incentives to help develop more relevant content.

The current research can expand to include other variables related to theories of information technology acceptance models and current modified theories that interpret usage behavior for innovative educational information technology. Furthermore, research can expand to include other specializations, for instance,

medical and engineering faculties, and to compare various types of educational activities conducted on such platforms.

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