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Factors influencing undergraduate use of e-books: A mixed methods study

Abstract

Academic libraries invest millions of dollars to make electronic resources available to students for free. However, free access might not necessarily result in students' sustained interest in and use of e-books. This interdisciplinary, mixed methods research investigates the factors influencing the intention of 279 undergraduate students to use e-books at a land-grant university in the southern US. Structural equation modeling of the survey responses suggests that organizational environment for information technology, external locus of control, subjective norm, perceived enjoyment (i.e., joyfulness), and information technology features play a significant role in influencing the intention of students to use e-books. Based on a combination of quantitative results and qualitative findings, this study identifies eight activities that libraries need to undertake in order to increase the use of e-books by undergraduate students.

1. Introduction

Undergraduate students born between 1982 and 2000, also known as millennials, have grown up in a digital world with easy access to technological advancements such as computers, smartphones, and Internet. There is a growing trend among millennials to interact with and learn from electronic resources such as e-books from anywhere, any time they like (Aharony, 2014a). Academic libraries spend millions of dollars on e-books and supporting information resource

infrastructure for making e-books available to their students for free. But free access might not necessarily lead to generating students' sustained interest in and use of e-books.

2. Problem statement

Existing studies of e-book adoption by students often do not adopt a holistic approach (e.g., Foasberg, 2011; Girard, 2014; Mafunda, Bere, & Swart, 2016; Potnis, Deosthali, & Pino, 2017). For instance, they do not attempt to learn whether students: (1) find the existing collection of e-books in their academic libraries relevant, (2) are involved in the selection of e-books, (3) are influenced by peers about using e-books, (4) can access and try any e-book of their choice before committing to using e-books, (5) desire any specific features in e-books, (6) have enough skills to use advanced features of e-books, and (7) get timely help from librarians for addressing any issue related to accessing and using e-books. Undergraduate students, who represent one of the main target user groups of e-books in academic libraries, rarely have equal or any say in the process of selecting e-books at academic institutions (Ashcroft, 2011; Slater, 2010). But rarely does any study investigate the effect of such factors on their adoption of e-books.

From a practice point of view, academic libraries rarely have specific strategies relevant and applicable to the characteristics and needs of millennial students for creating, sustaining, or growing their interest in electronic resources including e-books (Cassidy, Martinez, & Shen, 2012; Walters, 2013). Several global surveys have reported two findings consistently: academic libraries need to a) raise awareness about the e-books they offer, and b) change how they offer them to students (Ashcroft, 2011). Studies also show that academic libraries need to make students' experience of reading e-books more congruent with that of other electronic resources (Slater, 2010). But there is hardly any focused guidance available for academic libraries to address these specific issues concerned with millennial user population.

This mixed methods research examined the factors influencing the intention of undergraduate students to use e-books. The study adopted a holistic approach by employing theoretical perspectives from psychology, organizational behavior, information systems, library science, and information science to explain the behavioral intention of millennial undergraduate students to use e-books licensed by academic libraries. The results inform librarians, library administrators, e-book publishers, and academic instructors from all disciplines, as well as undergraduate students and their parents. The study also suggests ways in which academic libraries can better position their e-book collections for use by millennial undergraduate students.

3. Literature review

An individual's intention to engage in a particular behavior such as adoption of electronic resources is shaped by personality, technological, environmental, and organizational factors. A majority of empirical studies on the adoption of electronic resources by students are qualitative in nature (e.g., Urquhart and Rowley, 2007). These exploratory studies identify factors that can be broadly categorized into technological (e.g., features of e-books, features of e-readers, cost of accessing and using e-books), personality (e.g., self-efficacy, technology literacy, information literacy, etc.), and environmental (e.g., digital rights management, academic policies, etc.) (Girard, 2014; Potnis et al., 2017). However, several of these exploratory studies report findings based upon relatively small sample sizes and do not conduct any statistical testing or calculate the statistical significance of findings to confirm that findings are not by chance.

By contrast, some quantitative information science studies (Aharony, 2014b; Deosthali, Potnis, Elliott, & Fesmire, 2015; Johnston, Berg, Pillon, & Williams, 2015; Joo & Choi, 2015; Lai & Chang, 2011; Mafunda et al., 2016; Shin, 2011; Wang & Bai, 2016) propose theoretical models using factors drawn from the information systems literature on information technology adoption to understand student acceptance of e-books. Several of these explanatory studies

employ a combination or a variation of constructs from the decomposed theory of planned behavior (DPTB; Goodhue & Thompson, 1995), the technology acceptance model (Davis, 1989), the diffusion of innovation theory (Rogers, 2003), the unified theory of acceptance and use of technology (Venkatesh, Morris, Davis, & Davis, 2003), and similar theories built on constructs from psychology and communication (Potnis, 2015). Many of these studies find personality factors to be most significant in influencing students' adoption of e-books. Most frequently identified significant personality factors include attitude (Marques de Oliveira, 2012; Wang & Bai, 2016), perceived ease of use (Deosthali et al., 2015; Johnston et al., 2015; Joo & Choi, 2015), perceived usefulness (Johnston et al., 2015; Joo & Choi, 2015; Shin, 2011), personal innovativeness (Aharony 2014b; Mafunda et al., 2016), and awareness of e-books (Wang & Bai, 2016). The present investigation advances this body of knowledge by testing the effects of the following five factors on the intention of millennial students to use e-books: organizational environment for information technology, external locus of control, subjective norm, perceived enjoyment, and information technology features (Table 1).

[Table 1 about here]

Table 1. Classification of factors

3.1 Organizational environment for information technology

In the context of existing research dominated by personality factors, an organizational factor such as organizational environment provides a complementary perspective by presenting possible effects of external conditions on the intention of students to adopt e-books. Nolan's (1973) information systems development stage theory provides the theoretical foundation for evaluating organizational environment for information technology. Based on this theory, some scholars have proposed measurement techniques and parameters. For example, Benbasat, Dexter, Drury, and Goldstein (1984) criticize the stage theory and summarize and propose 19

criteria for measuring readiness and maturity of organizations for offering information technology services and products to patrons. Complexity, instability, and resource availability are the three most common dimensions of measuring organizational environment (Sharfman & Dean, 1991). In the present study, organizational environment refers to the conduciveness of the environment provided by the academic institution to millennial students for using e-books.

A combination of variables from the DTPB (Goodhue & Thompson, 1995), the diffusion of innovation theory (Rogers, 2003), and the stage model (Nolan, 1973; as well its critique by Benbasat et al.,1984), and the subsequent e-commerce adoption model (Liu, 2008) laid the foundation of the scale developed in the present study for measuring organizational environment for information technology. In particular, this research relies on resource facilitating conditions in organizations (from DTPB), trialability of innovation facilitated by organizations to its patrons (from the diffusion of innovation theory), and knowledge of employees to help patrons address issues with information technology adoption (from the stage model).

3.1.1 Resource facilitating conditions in academic libraries

Resource facilitating conditions refer to the resources needed to engage in the behavior of using e-books which are made available by academic institutes. Urquhart and Rowley (2007) propose a model for understanding students' information behavior when using electronic resources. According to this model, availability of electronic resources plays a key role in influencing students' use of electronic resources.

3.1.2 Trialability of innovation: Trying e-books for free

Rogers (2003) describes the innovation-diffusion process as "an uncertainty reduction process" (p. 232), and he proposes five attributes of innovations that help to decrease uncertainty about the innovation. Trialability is one of the characteristics of innovation, and is the degree to which an innovation may be experimented with by potential adopters. This research

study focuses on trialability of e-books because cash-strapped undergraduate students would presumably like to try using e-books before committing to or renting them. If many e-books covering a wide variety of topics of interest are made available for free by their academic institutions, curious students may be more likely to try them before they start using them. The more an innovation is tried, the faster its adoption. After examining the adoption of e-books from the diffusion of innovation perspective Waheed, Kaur, Ain, & Sanni (2015) found that trialability of e-books significantly influenced the adoption of e-books by students. Due to the millennial students' affinity toward mobile devices, they may also be more likely to try e-books on their mobile devices anywhere and anytime they want. Reinvention is also possible while trying e-books for fun, in that students might discover unintended usage of e-books. For instance, Jamali, Nicholas, and Rowlands (2009) found that when students could use e-books for completing assignments, this stimulated their interest in using e-books on a regular basis.

3.1.3 Librarian knowledge

Knowledge of employees could help patrons resolve the problems encountered when using information technology services or products (Benbasat et al., 1984; M. Liu, 2008; Nolan, 1973). M. Liu (2008) found technical knowledge of employees to be an important indicator of organizational capability of offering mobile-based electronic services to patrons. Urquhart and Rowley (2007) suggest support and training as one of the factors that could potentially help undergraduate students use electronic resources. Without knowledgeable librarians, it is not possible to support and train undergraduate students. Urquhart and Rowley (2007) propose organizational environment (culture) as one of the factors influencing information behavior of undergraduate students when using electronic resources like electronic journals but they neither develop measures nor test this variable using any empirical data. This research inquiry advances their work using rigorous statistical techniques.

Abels, Liebscher, & Denman (1996) found that perceived utility of, and hence, use of electronic resources in academic libraries by patrons correlated significantly with the organizational environment and number of services offered by the libraries. They did not compute the statistical significance of this finding. Students are likely to develop a negative attitude toward using electronic resources if their academic libraries do not introduce electronic resources in a positive spirit. For instance, a negative work environment at their academic library might create a low perceived utility of electronic resources made available by the academic library, which discourages students from relying on electronic resources (Lee, 2015). Uncertainty associated with accessing electronic resources (e.g., number of licenses, subscription availability, Internet connectivity and speed, etc.), which are made available by academic libraries, affects students' intention to use electronic resources (Mishra, Allen, & Pearman, 2015). Therefore, it is important that academic libraries and librarians provide a conducive and supportive environment for reducing uncertainty of using e-books. Hence, the first hypothesis was:

H1: Conducive and supportive organizational environment created by academic libraries for e-books positively affects the intention of students to use e-books.

3.2 External locus of control

People who have high external locus of control believe that external events have more influence over a situation than they personally do (Blanchard & Henle, 2008), thereby undermining the effect of their personality factors on their behavior. Hence, this study tests the effect of external locus of control on students' adoption of e-books. Locus of control is a personality dimension representing people's belief that their decisions and life are controlled by environmental factors that they cannot influence, or by chance or fate (Chak & Leung, 2004; Rotter, 1966). Although external locus of control can be considered as one construct, Levenson

(1974) demonstrates that external locus of control has two components: the belief in powerful others and the belief in chance. Morgan, Tyler and Fogel (2008) found external locus of control to be a useful factor in explaining fatalism among people, and linked external locus of control to environmental factors such as power dynamics and identity. For instance, students who believe in fate or feel that they are not in charge of what is happening in their lives are likely to think that their opinion does not matter to the administrators at their academic institutes.

Individuals with external locus of control and high anxiety negatively affect information technology adoption (Marakas, Johnson, & Palmaer, 2000). Kay (1990) found that external locus of control was strongly associated with users' basic skills in operating information technology artifacts. Individuals who had a higher external locus of control were more likely to engage in organizationally focused counterproductive behavior (Blanchard & Henle, 2008; Fox & Spector, 1999). In the context of the present study, students are less likely to use e-books if they think that they are not part of university administrators' decisions related to e-books, including the process of selecting e-books. The second hypothesis was:

H2: Students' external locus of control (i.e., belief in powerful others making all the decisions about e-books at their academic institution) negatively affects their intention to use e-books.

3.3 Subjective norm

Since subjective norm is the most commonly reported significant environmental factor, which is also a non-personality factor, this research examines its effect on the adoption of e-books by millennial students. Subjective norm (i.e., social influence) can be explained as the social pressure an individual perceives regarding whether the behavior should be performed (Ajzen, 1991). An individual's perceptions about a behavior influenced by the judgment of one's significant others such as parents, spouse, teachers, friends, and coworkers can be termed as

normative beliefs. Typically, subjective norm captures an individual's assessment of the extent to which others desire the performance or nonperformance of the individual's specific behavior (Srite & Karahanna, 2006). If the user has no knowledge of the system, then they may seek the opinion of others who do have this knowledge (Goodhue & Thompson, 1995).

Rowley (2016) found that willingness to abide by tutors' instructions for using electronic resources positively influenced the intention of students to use e-books. Encouragement given by a virtual community and the ability of its members to use information shape students' ongoing use of electronic resources (Noh, 2016). Training and support by library staff can change students' negative perceptions towards e-books. A mixed methods study surveying undergraduate students in three rounds (pre-course, post-course, and follow-up) highlights the significance of training students for using electronic resources in academic libraries; the user training positively influences students' use of electronic resources including e-books (Chen, 2015). Taking these findings into account, a third hypothesis was developed:

H3: Subjective norm is positively related to the intention of students to use e-books.

3.4 Perceived enjoyment (i.e., joyfulness)

Rarely have any information science research studies examined the effect of perceived enjoyment on students' intention to adopt e-books. Self-determination theory (Deci & Ryan, 1985) shows that individuals have natural, innate, and constructive tendencies to develop an elaborate and unified sense of self. It focuses on how individuals develop a coherent sense of self through regulation of their actions that may be self-determined, controlled, or motivated (Hwang, 2005). Thus, self-determination theory explains motivation and its role in shaping personality in a social context. Perceived enjoyment refers to the extent to which the activity of using information technology artifacts is perceived to be personally enjoyable aside from the instrumental value of the artifacts (Davis, Bagozzi, & Warshaw, 1992). Intrinsic motivation refers

to “the performance of an activity for no apparent reinforcement other than the process of performing the activity per se” (Davis et al., 1992, p. 1112). Perceived enjoyment also indicates the performance of an activity for no apparent reason other than the process of performance itself (van der Heijden, 2003). This intrinsic motivation represents the extent to which enticing individuals’ enjoyment is perceived through the activity of using a specific product or service, rather than derived from any of its own performance consequences. Perceived enjoyment is a type of intrinsic motivation of users (Hwang & Kim, 2007; Vallerand, 1997; Venkatesh & Speier, 2000) for adopting electronic resources such as e-books. Past research has demonstrated that perceived enjoyment influences both attitude and consumers’ behavioral intention toward using a specified information source (Moon & Kim, 2001). An individual can experience immediate enjoyment or fun from using a specific system and can perceive any active involvement in using new technology to be enjoyable (Igbaria, Schiffman, & Wieckowski, 1994). Venkatesh and Speier (2000; Venkatesh, 1999) found that a game-based training method aiming at enhancing intrinsic motivation resulted in higher enjoyment than a traditional training method.

Prior studies of the World Wide Web use often focused on perceived enjoyment to gain an accurate prediction of user acceptance toward a specific source, primarily because a product or service used and associated with enjoyment contributes to a causal relationship (Bruner & Kumar, 2005; Moon & Kim, 2001; van der Heijden, 2003). Students exhibit low levels of commitment to using electronic resources if they do not enjoy their interaction with such resources (Rowley, 2016). Several studies on flow theory show a positive relationship between perceived enjoyment and the extent to which users feel in charge of their interaction with information technology artifacts (Chung & Tan, 2004; Ghani & Deshpande, 1994; Webster & Ho, 1997). Flow includes intense concentration, a sense of being in control, a loss of self-consciousness, and a transformation of time (Agarwal & Karahanna, 2000). Millennial students

in the present study are likely to feel in charge of their interactions with e-books if they enjoy reading e-books, leading to the fourth hypothesis:

H4: Perceived enjoyment (i.e. joyfulness) from using e-books would positively affect the intention of students to use e-books.

3.5 Information technology features (i.e., features of e-books)

Most studies on e-book adoption treat e-books as black boxes (except for few, such as Mafunda et al., 2016). Social construction of technology suggests that users at different points in time could interpret features of information technology artifacts differently (DeSanctis & Poole, 1994; Orlikowski, 2008). Jasperson, Carter, and Zmud (2005) argue that various features of information technology artifacts are "…resisted, treated with indifference, used in a limited fashion, routinized within ongoing work activities, championed, or extended" (p. 527). After reviewing the literature on information technology adoption, Jasperson et al. (2005) concluded that past studies had ignored the role of distinct features of information technology in influencing the intention of users to use information technology. Hence, they strongly advocate for studying the role of information technology operations, core and ancillary features, and other characteristics in shaping the intention of users to use information technology. Kim, Mannino, and Nieschwietz (2009) operationalized and tested features and complexity of an information system in an organization against its usage, and found that basic features of the information system were more readily accepted by employees as opposed to advanced features of the system. Urquhart & Rowley, 2007) identify information resource design as one of the factors influencing information behavior of undergraduate students when using electronic resources but they neither develop measures nor test this variable using any empirical data. Depending on publishers (e.g., Access Medicine, eBrary, EBSCO, and Gale), e-books typically allow users to carry out advanced operations such as viewing high-resolution images, enabling a read-aloud option, translating text, downloading chapters separately, or browsing tables of content (Table

2). E-book publishers typically display a list of features associated with e-books even before users could start using them, which is likely to formulate and influence expectations. Users might adopt features, resist but adapt, or avoid some features. The present study assesses the influence of characteristic features of e-books on the intention of students to adopt e-books.

[Table 2 about here]

Table 2. Features of e-books offered by leading publishers

Researchers have found edutainment (i.e., mixing education with multimedia entertainment) to be an effective technique for developing new skills and knowledge among millennials (Okan, 2003). This is a hybrid genre of teaching that relies on visuals, games, and informal didactic styles of address, with the purpose of seeking and retaining attention of learners by engaging their emotions through interactive electronic resources. Hence, e-books equipped with multimedia features are likely to be more appealing to millennial students than e-books with basic editing capabilities. Tenopir (2003) provided a comprehensive overview and analysis of over 100 user studies focusing on the adoption of electronic resources in libraries. One of her principle conclusions is that students do not adopt electronic resources if they are not convenient, relevant, or time saving in their natural workflow. The search feature of electronic resources significantly enhances the perceived convenience and use of electronic resources among students, since it saves their time when searching for specific information (Rowley, 2016).

A study with 221 undergraduate students found that features of electronic resources that help students search and edit information play a key role in influencing their use of these resources (Noh, 2016). Millennial students take basic features such as copying and pasting text for granted (Abdullah & Gibb, 2009). Advanced features of e-books (e.g., bookmarking pages, multimedia, ability to download e-book chapters separately, sharing a selected section via social

media) can generate a higher perceived usefulness of e-books among millennial students, encouraging them to use more of such e-books (Joo & Choi, 2015). The more useful advanced features e-books have, the more likely millennial students are to use them, leading to the fifth hypothesis:

H5: A combination of basic and advanced features of e-books encourages students to use e-books.

3.6 Proposed model

The literature review led to the development of a research model to guide the study (Figure 1).

[Figure 1 about here]

4. Methodology

The university in the southern US where this study was conducted introduces incoming classes of undergraduate students to academic libraries on campus through tours, website, pamphlets, social media, and brochures. For instance, in 2016, the university licensed close to 800,000 e-books on the common website for its four libraries. Students could search for them in two clicks using OneSearch, a Google-like interface enabled by the Discovery integrated library system. In fiscal year 2016, the total budget for all of the academic libraries was over $20 million.

4.1 Procedures

4.1.1 Quantitative data collection

In the spring semester of 2016, 500 undergraduate students enrolled in a general education course in the College of Communication and Information were invited to participate in this study. The research used a self-reporting questionnaire hosted online by Qualtrics. Each

participant completed a survey, the purpose of which was described as follows: “This project studies the factors affecting one’s intention to adopt e-books. You are invited to participate in this research project… Participation in this project is voluntary.” The survey was designed for undergraduate students who had never used e-books. Although there was no criterion that participants had to have never used e-books. Respondents were informed that their responses would be anonymous and that information from the questionnaire would be used for research purposes only. In accordance with standard Institution Review Board (IRB) policies, the questionnaire presented information about who was directing the research, how the researchers could be contacted in case there were any questions, and the phone number and e-mail address of the university IRB to report any concerns about the research. No concerns were reported.

Students received one credit for attempting the survey. There was no penalty for not participating. Students who did not participate had other opportunities to earn the research participation credit throughout the semester. The response rate was 59.6% (298 students). There were 16 incomplete responses. Three respondents were not millennials and their responses were not considered. Thus, the total sample for this study consisted of 279 undergraduate students.

Most commonly cited rules-of-thumb for determining a sample size for structural equation modeling (SEM) state that studies need to satisfy at least one of the following: (a) a sample size between at least 100 to 200 (Boomsma, 1985), (b) 5 or 10 observations for every variable (Bollen, 1989), or (c) 10 cases per variable (Nunnally, 1967). The sample of 279 students exceeds minimum sample size widely accepted for carrying out SEM.

All of the 259 members of the sample were in the age range of 18 and 22, which meets the definition of millennial. The survey had 16 questions, of which two were demographic, eight were rating scales, three multiple choice, and the remainder questions with six sub-questions

were open-ended questions. On average, it took 11 minutes to complete the survey. Male students made up 59.4%of the sample, and females 40.6%.

4.1.2 Quantitative data analysis

Prior to any analysis, the data were evaluated for duplicate participants and missing data. The data were tested for multicollinearity. Tolerance was greater than .10 (.73) and the variance inflation factor was less than 10 (1.55) thus demonstrating that multicollinearity was not an issue. SEM was used to analyze data quantitatively with AMOS, a module of SPSS software.

4.1.3 Qualitative data for holistic portrayal of students' e-book usage

The qualitative research focused mainly on the use by respondents of library services and facilities (i.e., use of space, checking out books, use of electronic resources, and help sought from librarians). This offers a holistic portrait of e-book usage by millennial students. The survey contained the following open-ended questions.

1. What do you think of libraries at our university? How familiar are you with these academic libraries?
2. Have you ever consulted any librarian at our university in the past for completing any task(s)? How was your experience?
3. How could librarians at our academic libraries help you to improve your overall experience of using e-books in the future?
4. Can you rank order features of e-books in terms of their importance to you? [Students were presented with 13 common features of e-books]

Two researchers coded student responses to analyze qualitative data. Inter-coder reliability measured over 90%.

4.2 Measures

Table 3 presents a summary of constructs and measures used for this study. These items that were validated by prior research, with minor modifications of the wording of the questions to fit them into the context of e-book use.

[Table 3 about here]

Table 3. List of measures

Table 4 provides the mean, standard deviation, and Cronbach's alpha (i.e., internal consistency reliability estimate for the scale of each variable) for the model.

[Table 4 about here]

Table 4. Mean, standard deviation, and Cronbach's alpha

4.2.1 Organizational environment for information technology

A five-item scale for measuring conduciveness of an organizational environment for using information technology was derived from scales developed for measuring: (a) resource facilitating conditions in organizations (Taylor & Todd, 1995), (b) trialability of innovation facilitated by organizations to their patrons (Agarwal & Prasad, 1997; Rogers, 2003), and (c) knowledge of employees in helping patrons address issues with information technology adoption, based on the critique of the stage model by Benbasat et al. (1984) and its application by Liu (2008).

After analyzing student data collected from 786 potential users of a computer resource center, Taylor and Todd (1995) proposed the DTPB as a method of understanding the role of organizational factors, including resource facilitating conditions, in shaping the behavioral intention of students to use information systems. In the diffusion of innovation theory, Rogers (2003) considered trialability as one of the perceived characteristics of innovation. Since students' ability to use e-books on a trial basis could affect their intention to use e-books in the

long run, the scale developed by Agarwal and Prasad (1997) for measuring trialability was adopted for the present study. Liu (2008) applied Benbasat et al.'s (1984) critique of the stage model to study the adoption of e-commerce in Chinese organizations. Based on data from 156 employees in 16 industries, covering 11 cities and regions in Shaanxi in China, he concluded that the knowledge of employees in helping patrons address issues concerning information technology influenced the adoption of e-commerce portals in China.

In the 5-point Likert type scale items, values ranged from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Results were averaged to derive an overall measure. An example of an item relating to resource facilitating condition leading to conducive environment is "Libraries at our university would have e-books in multiple disciplines including but not limited to communication, health, business, engineering, and politics."

4.2.2 External locus of control

Originally, Phares (1957) developed a 13-item scale to measure individual differences in belief in external control as a psychological variable as part of his study of the effects of chance (an external factor) and skill (an internal factor) on students' performance expectations. Rotter (1966) expanded the original scale to 29 items and tested it on 200 males and 200 females. Irrespective of the gender he found that "people in American culture have developed generalized expectancies…in regard to whether or not reinforcement, reward, or success…is dependent on their own behavior, or is controlled by external forces" (p. 25). If people perceive a situation as one in which luck or external factors control the outcome, they are less likely to raise expectations. This study developed a three-item scale for measuring external locus of control derived from Rotter's (1966) scale that was further refined by Nelson and Quick (2006). In this 5-point, Likert type scale, values ranged from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Results were averaged to derive an overall measure. A sample item is "Students have a little control over the selection of e-books by libraries at our university."

4.2.3 Subjective norm

Subjective norm was elaborated in detail by Ajzen (1991)and was tested using the theory of planned behavior. The guidelines were proposed by Ajzen (2001) after reviewing the literature on attitude theory with concepts of attitude, attitude formation and activation, attitude structure and function, and the attitude-behavior relation. In the present study, the three-item measure for subjective norm was developed using Ajzen's (2001) guidelines for constructing items by. The 5-point, Likert type scale contained item values ranging from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Item values were averaged to derive an overall measure, and the scale was scored so that higher scores reflected a higher level of subjective norm toward the intention to adopt e-books. An example of an item of subjective norm is "People who influence my behavior would think that I should use e-books."

4.2.4 Perceived enjoyment

A three-item measure for perceived enjoyment (i.e., joyfulness) was adapted from Davis et al. (1992) who first applied motivational theory to study user acceptance and use of new technologies. In particular, they examined the relative effects of usefulness and enjoyment on intentions of employees to use a word processing software and a business graphics program at workplace. The present study used Likert type scale ranging from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Items were averaged to derive the overall measure, and the scale was scored so that higher scores reflected a high degree of positive attitudes toward adopting e-books. An example of an item is "I think that using e-books would be fun."

4.2.5 Information technology features

Millennial students in the present study are generally comfortable using information technology. Hence, to test the effects of basic and advanced features of e-books on their intention to use e-books, this study developed a three-item measure for information technology

features. It was a 5-point, Likert type scale ranging from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Items were averaged to derive the overall measure. An example of an item of information technology features is “It would be nice if e-books allow me to share content with others using social media or downloading e-book chapters.”

4.2.6 Behavioral intention

A majority of studies on information technology adoption (Agarwal & Karahanna, 2000; Venkatesh et al., 2003), including e-book adoption (Aharony, 2014b; Shin, 2011), employ behavioral intention as a dependent variable. Vankatesh and Morris (2000) developed a two-item scale for studying the use of a new software system in an organization. Since software is also an electronic resource, the present study on e-book usage adapted the two-item measure for behavioral intention developed by Venkatesh and Morris (2000). The measure was scored on a 5-point, Likert type scale ranging from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). Items were averaged to derive the overall measure, and the scale was scored so that higher scores reflected a high level of intention to adopt e-books. An example of an item of intention is “I intend to use e-books in the near future.”

5. Findings

SEM was used to test the five hypotheses. Numerous overall fit indexes for SEM have been proposed over the last 20 years and there is no general agreement on which measures are preferred (Kline, 2005; Maruyama, 1998; Meyers, Gamst, & Guarino, 2013). Myers, Calantone, Page, and Taylor (2000) proposed that three types of fit indicators should be assessed: absolute fit, relative fit and parsimonious fit. Using the guidelines by Meyers et al. (2013), and McDonald and Ho (2002), the hypothesized model was evaluated using the following indexes: chi-square, relative chi-square, the comparative fit index, the normed fit

index, the root mean square error of approximation, the parsimonious comparative fit index, and the parsimonious normed fit index.

5.1 Assessing model fit

Based on the fit indices, the model exhibited a good fit to the data. Although the chi square test was significant ($p < .001$), the relative chi square ($\chi^2 / df = 2.2$) reflects a moderate fit of the model to the data. The values for comparative fit index and normed fit index were 0.94 and 0.93 respectively. A cut-off value of 0.90 or greater for both comparative fit index and normed fit index is needed in order to ensure a very good fit of the models to the data (Hu & Bentler, 1999), which is the case in the present study. The root mean square error of approximation (RMSEA) value was 0.07. Any value below 0.08 represents a good fit (MacCallum, Browne, & Sugawara, 1996), which suggests that the RMSEA value reflects a good fit of the model to the data.

5.2 SEM results

The measurement model explained 39% of the variance in the intention to adopt e-books. After controlling for the effects of age and gender, this study found that all the hypotheses were supported (Figure 2; Table 5). Typically, the value of standardized coefficients refers to the change in the dependent variable resulting from a unit change in the independent variable (Ullman & Bentler, 2003). For instance, if an independent variable such as information technology features is having a significant impact on the ability to predict the intention of students to use e-books, then the standardized coefficient for information technology features should be significantly different from zero. In SPSS software, which was used for data analysis, standardized coefficients are labeled as beta coefficients. Hence, this analysis used beta coefficients to test whether hypotheses were supported by the SEM.

[Figure 2 about here]

Figure 2. Path diagram of behavioral intention to use e-books by students

[Table 5 about here]

Table 5. Results of structural equation modeling

SEM results show that organizational environment for information technology is positively related to the behavioral intention of respondents to use e-books ($\beta = 0.2$, $p \leq 0.001$). Thus hypothesis 1 is supported. This finding confirms that there is at least a 99% probability that students' use of e-books is influenced by organizational environment for information technology. The more conducive the organizational environment is the more likely it is that students are going to use e-books.

Respondents with high external locus of control are less likely to use e-books ($\beta = -0.03$, $p \leq 0.05$), supporting the second hypothesis. There is at least a 95% probability that students who have generalized beliefs that they have little control over their academic environment, including the selection of e-books by academic libraries, are less likely to use e-books in the near future.

The results also indicate that subjective norm is positively related to the behavioral intention of respondents to use e-books ($\beta = 0.1$, $p \leq 0.05$); thus the third hypothesis was supported. There is at least a 95% probability that students are likely to use e-books in the future, if their parents, classmates, and professors encourage them to use e-books. Perceived enjoyment from using e-books positively affects the intention of respondents to use e-books ($\beta = 0.3$, $p \leq 0.001$), supporting the fourth hypothesis. There is at least a 99% probability that students who think that the use of e-books might prove to be enjoyable or fun are likely to use e-books in the future. Finally, there is a 95% probability that students are also likely to use e-books if e-books have the basic and advanced features they desire ($\beta = 0.3$, $p \leq 0.05$). Thus, all hypotheses were supported by the SEM.

5.3 Qualitative findings

Since the first hypothesis is supported by the quantitative data, it appears that a conducive and supportive organizational environment created by academic libraries for e-books would positively affect the intention of students to use e-books. But the quantitative data does not reveal the nature and degree of the conducive and supportive environment. The quantitative data also confirms that a combination of basic and advanced features of e-books would encourage students to use e-books, but it is not clear which features of e-books are preferred by millennials. The qualitative research findings fill these gaps by revealing details about the use of libraries (i.e., space, books, electronic resources, and expertise of librarians) by respondents and their desire to use specific features of e-books.

5.3.1 Familiarity with the libraries

The land-grant university where this study was conducted advertises its libraries as “the 24-hour intellectual and social hub” on campus. However, a majority of undergraduate students do not use and possibly do not appreciate library resources. For example, 22% of respondents were not familiar with any of the four academic libraries on campus; 35% neither checked out books nor electronic resources but used library space for studying, group work, or accessing computers; and 4% used electronic resources (excluding e-books) but were not familiar with other services libraries had to offer (Table 6).

[Table 6 about here]

Table 6. Degree of use of libraries by undergraduate students

Respondents had used online databases and electronic journals using OneSearch, the search engine used by the common website of all the libraries, but nobody referred to using e-books in the past. Some students reported their past negative experience with academic libraries and a subsequent negative perception about libraries. Some respondents either did not

feel the need to use library resources, lacked the skills (i.e., digital literacy) to use electronic resources, or were unaware of the resources and services offered by campus libraries.

- Outdated: “They're cool but outdated. I like [University]’s library for studying purposes but that's about it.” “I enjoy the [University] library. I am fairly familiar with the facility but at times I feel that they need to update their technology.”
- Findability: “I enjoy spending time in the libraries in campus. I enjoy the atmosphere. Finding books there is a little bit of a daunting task for some students, luckily I had experience finding books at the [University] library through my high school.” “I think it’s too loud, and could use more quiet areas. Books are hard to find too.” “I like the [University] libraries. It is obvious that there are lots of features and information available but I don't think it is easy to get to those resources.”
- Attitude: “They are not very good. I am very familiar with them. [University] libraries act very helpful until you actually need the help.”
- Time required to find items: “There are nice. They are a little bit of an inconvenience when it comes to having to find a source in a short time period.” “I think the library here has a lot to offer, but it might be too much. It's like a maze trying to find things on the library website.”
- Lack of skills: “I do not know much about the [University] libraries. I only go there to study. Using the databases can be a little confusing at times and is kind of hard.”
- Lack of need: “They're alright. I never personally check out many books because I am usually busy studying.”

- Lack of awareness: “The libraries offer a wide range of services for students; however, it is difficult to access and utilize these services, because many students are unaware of their availability.”

Around 13% of respondents seemed to be using and possibly benefitting from all of the library resources and services, such as electronic resources (excluding e-books), books, space, and expertise of librarians. Clearly, libraries need to formulate policies and strategies to increase this patron segment.

5.3.2 Consulting with any librarian in the past

The university employs around 200 librarians and administrators to manage four libraries. However, only 22.6% of respondents (*n* = 63) had ever consulted a librarian at any of the four academic libraries at the university. It is possible that consultation with librarians might create a more conducive environment for students to use e-books, which would then align with the first hypothesis.

5.3.3 Prior experience working with librarian(s) at the university

Ninety five percent (*n* = 60) of those who had consulted librarian(s) at the university in the past reported positive sentiments about librarians. Almost all of them seemed to have had a positive experience, and hence, a positive image of librarians (Table 7). This suggests that students who consult with academic librarians are better able to meet their information needs, which underscores the importance of a conducive and supportive environment for intention to use e-books.

[Table 7 about here]

Table 7. Prior experience with librarians

5.3.4 Student suggestions for librarians

Several respondents were not even aware of the huge collection of e-books at the university or that they could access these e-books for free. They suggested that librarians help them use e-books by making themselves more available and proactively approaching students to make them aware of the collection, recommending specific e-books, helping them search e-books, and teaching them how to use e-books (Table 8). Actions such as these would enhance the conducive and supportive environment, which would be expected to lead to an increase in e-book use.

[Table 8 about here]

Table 8. Types of help librarians could provide for increasing e-book use

5.3.5 E-book features important for millennials

Millennials enjoy immediacy and interactivity with electronic resources (Z. Liu & Huang, 2016; Starlink, 2004). Hence, this study asked respondents to rank 13 different operations that can be performed using e-books in terms of their importance. Bookmarking pages, copying text, and searching across full text emerged as the three most important operations for the respondents (Table 9). This finding relates to the fifth hypothesis.

[Insert Table 9 Here]

Table 9. Features of e-books

6. Discussion

6.1. Lessons for libraries

The findings suggest that there are eight activities that libraries might undertake to increase the use of e-books by millennials (in Table 10, these are mapped to the relevant hypotheses).

6.1.1 Build a more positive, utilitarian and hedonic image of libraries

Some respondents have a positive image of academic libraries at the university where this study was conducted. They admire libraries for being resourceful, having excellent hours and people around to help, offering variety in study floors, making sure that there are clean bathrooms, and providing facilities to go online or to locate and check out books. However, these perceptions are not a sufficient condition for their use of e-books; only 13% of respondents used and possibly benefited from library space, books, electronic resources, and librarians. Academic libraries need to build a more positive, utilitarian and hedonic image to make using e-books attractive to millennials and to retain their interest.

Academic libraries at this university project themselves as intellectual and social hubs on campus—a statement many academic libraries would be likely to make in one form or another. Libraries might consider presenting themselves also as entertainment hubs on campus, since results show that perceived enjoyment is a strong predictor of the behavioral intention of millennial students to use e-books. Generally, for hedonic information technology artifacts, perceived enjoyment is a strong predictor of behavioral intention to use these artifacts (van der Heijden, 2004). Quantitative findings suggest that millennial students might perceive e-books as hedonic electronic resources. Hedonic information technology artifacts fulfill individual values rather than instrumental (i.e., utilitarian) value to the user. Students are more likely to explore e-books as hedonic items, if they perceive libraries as entertaining places on campus rather than their current utilitarian perception of libraries where space, books, and librarians are available mostly for completing assignments and projects.

6.1.2 Actively involve students in the selection and management of e-books

This study confirms that students' external locus of control (i.e., belief in powerful others making the decisions about e-books at their academic institution) negatively affects their

intention to use e-books. This finding suggests that it is important for academic libraries to actively involve students in the process of developing and managing the collection of electronic resources including e-books. Libraries could proactively advertise their intention and report on the student involvement in these activities.

6.1.3 Maintain a diverse collection of e-books

Quantitative findings reveal that organizational environment for information technology influences the intention of undergraduate students to use e-books. Qualitative findings suggest that the significance of this factor in influencing e-book usage by students is the result of students' deep-rooted negative perception of academic libraries and prior negative experiences with library space, technology, or librarians. One way that libraries could move away from their image of being "outdated," "irrelevant," and "boring" would be by diversifying and updating their electronic resources, including e-books. Also, a collection of non-study related e-books might help libraries build the more hedonic image necessary to attract and retain the interest of millennials in e-books.

6.1.4 Purchase e-books with features preferred by students

Urquhart and Rowley (2007) propose designing information resources that have appealing visuals and graphics, appropriate degree of interactivity with users, and the level of complexity matching the digital literacy of undergraduate students. Libraries can subscribe to e-books equipped with these interactive features popular among students. Desson (2015) suggests that academic libraries license e-books with advanced features including software and markup languages that make them accessible to a wide range of e-reading devices.

6.1.5 Publicize and promote the existing collection for more visibility among students

Lack of awareness about e-books, the perception that e-books are hard to access and use, and the perception that the collection of e-books is irrelevant to students, were the most

frequently reported reasons for not using e-books. Clearly, any academic library with a substantial e-book collection could make use of strategic publicity and marketing to enhance the visibility of e-books, and to point out that the collection is likely to represent the diverse disciplines in which undergraduates are taking courses. For instance, libraries could place signage in high-traffic areas such as elevators and doorways, use social media to advertise highlights of the collection, and schedule class time every semester in each department to inform more of the students about e-books.

6.1.6 Develop a user-friendly library website for better findability of e-books

As mentioned earlier, millennial students enjoy immediacy and interaction (Starlink, 2004). Respondents are more likely to rely on library websites, which serve as the gateway to electronic resources such as e-books, if they get quick results after use-friendly interactions. Students reported that they would find it desirable for a user-friendly version of the current search engine on campus (i.e., OneSearch) could get them the list of e-books.

6.1.7 Provide a student-centered experience for using e-books

Over 80% of American students with access to tablets had used e-books by 2015 (Statista, 2016). Building on this strong correlation between mobile devices and e-books, academic libraries could circulate different types of mobile devices which students then might use for reading e-books. Bhattacherjee, Perols, & Sanford (2008) found that individuals are sometimes oblivious to the external resources needed to use information technology artifacts, which in turn affects their intention to use the artifacts. A user who is somewhat resistant to reading e-books may use them more readily if their Internet connection is faster than expected or if adequate levels of technology support are available. Low performance expectations and lack of affordability of e-books (outside of academic collections) may discourage undergraduate students from adopting e-books on mobile devices (Yee, Qi, Yong, Wee, & Yee, 2015). If

academic libraries support students with consistent high-speed wifi, circulating mobile devices, and common spaces to hang out on campus, they might be more likely to enjoy reading e-books on campus. Designated quiet and noisy areas might allow students to create unique experiences, enjoying e-books the way they want in different parts of the library.

6.1.8 Ensure the presence of knowledgeable and approachable librarians to address students' issues related to e-books

Academic libraries have a responsibility to educate students about the ethical and legal use of information retrieved using e-books. Libraries should introduce students to concepts such as copyright, fair use of information, intellectual property rights, and so on. Knowledgeable and skilled librarians could provide informed support for students; preparing them to be better equipped for using e-books. Some respondents in the study had interacted with librarians who did not fully understand e-books themselves, hence the request by such respondents for knowledgeable librarians who could help them resolve issues related to accessing and using e-books. Respondents' minimum expectations for librarians are that they be familiar with the academic library website, which acts as the gateway to e-books at the university, and with e-books themselves. Suggestions included having librarians who are "educated on how to use e-books and find them" and "Younger librarians who are more technologically savvy."

[Insert Table 10 Here]

Table 10. Mapping activities to relevant hypotheses

6.2 Limitations

One of the limitations of this study is that it did not distinguish between e-books and e-textbooks. Another is the small sample size, so that findings cannot be generalized for the entire undergraduate student population at the university where this study was conducted or across

the country. However, this class was selected randomly for the study, so it is likely to represent the general undergraduate population at this university and similar institutions.

7. Conclusion

Past research has rarely adopted a mixed methods approach for exploring the adoption of e-books by millennial undergraduate students. A mixed methods approach helped this study interpret quantitative results by situating them in an appropriate context provided by qualitative findings. This complementary approach helped expose and understand the many dimensions of underutilization of e-books by millennials. This study adopted an interdisciplinary lens by using a combination of technological, organizational, environment, and personality factors drawn from psychology, organizational behavior, and information systems research. Very few studies have investigated the adoption of e-books by millennials using the combination of the interdisciplinary theories in this study. Various technological, organizational, environment, and personality factors collectively influence the utilization of e-books by millennials. Finally, this study proposes eight activities for libraries to increase the use of e-books by millennials.

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Table 1. Classification of factors

#	Factor	Key Concept	Type of Factor
1	Organizational Environment	Organizational support in the form of various resources to help patrons use information technology artifacts (Agarwal & Prasad, 1997; Benbasat, Dexter, Drury, & Goldstein,1984; Goodhue & Thompson,1995; M. Liu, 2008)	Organizational Factor
2	External Locus of Control	One's belief that they have no control over their life, and hence, their life and decisions are controlled by powerful people or fate (Chak & Leung, 2004; Rotter, 1966)	Personality Factor
3	Subjective Norm	Social influence or pressure from others for performing a behavior (Ajzen, 1991; Ajzen, 2001)	Environmental Factor
4	Perceived Enjoyment	Joyfulness associated with a behavior (Chang & Cheung, 2001; Davis, Bagozzi, & Warshaw, 1992)	Personality Factor
5	Information Technology Features	Operations, functions, or characteristics of information technology (Jasperson, Carter, & Zmud, 2005)	Technological Factor

Table 2. Features of e-books offered by leading publishers

	Access Medicine	**eBrary**	**EBSCO**	**Gale via TEL**
Annotate			√	√
Bookmark pages		√		√
Browse index		√		√
Browse table of content	√	√	√	√
Copy text	√	√		√
Download chapters separately		√	√	√
Have a read-aloud option		√		√
Highlight text		√		√
Link from indices to text			√	√
Print page or chapter	√	√		√
Search across full text	√	√	√	
Share text using social media	√	√	√	√
Translate to other languages (Spanish, French, Russian, etc.)				√
View high resolution images	√			

Table 3. List of measures

Organizational Environment for Information Technology (Adapted from Agarwal & Prasad, 1997; Benbasat, Dexter, Drury, & Goldstein,1984; Goodhue & Thompson, 1995; M. Liu, 2008; Rogers, 2003)	
1	Libraries at our university might have e-books in multiple disciplines including but not limited to communication, health, business, engineering, and politics.
2	A combined website of libraries at our university might show a huge collection of e-books.
3	It would be easy to search for e-books on the combined website of libraries at our university.
4	Libraries at our university would provide free access to e-books.
5	Librarians in our university would help me to resolve any issues related to using e-books.
External Locus of Control (Adapted from Kay, 1990; Nelson & Quick, 2006; Rotter, 1966)	
1	Students have a little control over the selection of e-books by libraries at our university.
2	It is difficult for students to have much control over the things university administrators do in their office.
3	This world is run by the few people in power, and there is not much the little guy can do about it.
Subjective Norm (Adapted from Ajzen, 2001)	
1	Generally speaking, I try to do what important people in my life think I should do.

2	People who influence my behavior would think that I should use e-books.
3	People who are important to me would think that I should use e-books.
Perceived Enjoyment (Adapted from Chang & Cheung, 2001; Davis, Bagozzi, & Warshaw, 1992)	
1	Use of e-books might prove to be enjoyable.
2	I think that using e-books would be fun.
3	The process of reading e-books would be pleasant.
Information Technology Features (Adapted from Jasperson, Carter, & Zmud, 2005; Kim, Mannino, & Nieschwietz, 2009)	
1	e-books should have multimedia features.
2	e-books should have basic features like editing of content (copy, paste, etc.), bookmarking pages, etc.
3	It would be nice if e-books allow me to share content with others using social media or downloading e-book chapters.
Behavioral Intention (Adapted from Venkatesh & Morris, 2000)	
1	I intend to use e-books in the near future.
2	I plan to use e-books for completing class projects, papers, assignments, or quizzes in the near future.

Table 4. Mean, standard deviation, and Cronbach's alpha

Factor	*M*	*SD*	*α*
Organizational Environment for Information Technology	2.21	.64	.85
External Locus of Control	2.45	.73	.71
Subjective Norms	2.76	.69	.92
Perceived Enjoyment	2.47	.77	.86
Information Technology Features	2.16	.71	.84
Behavioral Intention	2.18	.91	.85

Table 5. Results of structural equation modeling

Factor	β	Direction of Hypothesis	Hypothesis Supported?
Organizational Environment for Information Technology	0.2***	Positive	Yes
External Locus of Control	-.03*	Negative	Yes
Subjective Norm	0.1*	Positive	Yes
Perceived Enjoyment	0.3***	Positive	Yes
Information Technology Features	0.3*	Positive	Yes

Notes: * = $p \leq 0.05$; ** = $p \leq 0.01$; *** = $p \leq 0.001$

Table 6. Degree of adoption of libraries by undergraduate students

#	Degree of Adoption	%	Sample Comments
1	Not familiar with academic libraries at all	11	“I have never been in the [University] library.” “Not very familiar, I have only been into the library twice.” “I'm not very familiar with [University] libraries but I know it takes forever to find a book on your own and not being able to annotate a book makes it more difficult to comprehend.” “I have never checked out a book in the [University] library.” “I really have not explored how the library works.”
2	Unfamiliar with academic libraries but believe in them	11	“I'm not too familiar with the Library, however, I believe the library has multiple resources that allow students to find what they need.” “I think the libraries have much information, but I am not very familiar with the libraries.” “They're huge. Not very familiar at all.” “Not much. I know they're better than most other universities though.”

			“I think they are great but haven't used them at all.”
3	Limited familiarity and/or use of academic libraries	35	“Libraries are rarely used for books. Most students go to use the computers, study with people, or to just have an isolated place to study.” “I really don't know much about the libraries here. I mainly use them as a good, quiet place to study.” “I am vaguely familiar with libraries, but do not have extensive knowledge. I think it is a confusing but helpful place.” “I rarely use the library except for stat lab and sometimes for a desktop.” “I have only used the library for printing and studying, not much of the other features.”
4	Familiar with academic libraries but not necessarily with electronic resources	26	“I am familiar with [University] libraries, I come here often to study and to use their computers. I also use [University] libraries to print off stuff.” “I think they are a great resources with many helpful features that go unused.” “I love the [University] libraries and I'm very familiar with them.” “So familiar, i always stay in libraries! Out libraries is good!” “I think [University] library is one of the best that I have ever been privileged to use.”
5	Familiar with academic libraries and electronic resources	13	“I frequent the [University] libraries mostly to study. I use the databases often. I can generally find my way around the libraries by using the directory and without any help.” “The [University] Libraries are good, but not perfect. Most of my experience is with [Library], which is a good general library. My main beef with [Library] is the limited access to Special Collections. In 2016, these kinds of materials should be digitized and made available online.” “Overall, my experience with the [University] libraries has been pleasant. I've rented out laptops and various other items from the computer labs and I've used the online databases as well. I have no complaints concerning the libraries.” “I think they are a useful resource to take advantage of. They also provide a great study space. I work in the library so I am considerably familiar.”

			“I am fairly familiar with the [University] Libraries, I often use the search engines and databases. I also have checked out some books for different projects. I like libraries, I find it easy to focus in them.”
6	Use electronic resources alone	4	“I'm not very familiar with the [University] Libraries, but from what I've experienced, the online access is easy to use.” “I have only used the OneSearch feature. It has proved to be very helpful.” “The online search databases are helpful but I've never actually checked out a book or even looked for physical book in the library.” “I have never used libraries to checkout books. I mainly use their online resources for research articles for papers.” “Fairly familiar with the search engines, but not very familiar with much else.”

Note: To protect anonymity, the university name has been replaced with [University], and any specifically named library has been replaced with [Library]

Table 7. Prior experience with librarians

Experience with Academic Librarians	**Specific Comments**
Helpful	“The librarian was helpful, personable, and friendly.” “The librarians seem focused on their task at hand, but they are willing to assist students.” “The librarian was very helpful and pointed me in the right direction with my research.” “It was only through e-mail, but it was very helpful.” “It was pleasant. The interaction didn't take long and I was able to accomplish my goal fairly quickly with their help.” “My experience was good and the librarian was extremely helpful to myself and English class.” “The librarians are very approachable and friendly. My question was more general than specific, but they were still able to direct me towards resources that I didn't know how to find.”
Approachable	“They're typically approachable and happy to help.”

	“She was extremely nice and approachable. More so than my teacher.” “Very approachable.” “All of my experiences with the librarians have been positive and I have found them highly approachable.” “Very approachable, especially in an internet chat box.”
Informative	“It was a good informative experience.” “Very friendly and always give you a map of where to find your selected book as well as detailed notes on the call number and if you get lost where to re-route yourself.” “Good, helped me find information on my research topic.”
Kind natured	“It was awesome. They were very kind and genuine.” “They were kind and understandable.”
Mixed experience	“I think it is hit or miss. I have talked to one that was not very helpful or kind, but I have also talked to some very helpful and approachable librarians.” “They were very helpful and approachable. At times, it can be hard to find a librarian but for the most part it's been a pleasant experience.”
Not approachable	“It was not great. I did not find this person approachable.”

Table 8. Types of help librarians could provide for increasing e-book use

Form of Help	Specific Comments
Publicize availability and utility of e-books	“Promote the e-books more to students.” “I think they should promote them more, i had no idea we had them.” “Let us know that a lot of them are free…” “Just making it understood that there are e-Books.” “Advertise the use of e-books more.” “Letting students know that they're available online.” “Make it a known resource.”
Recommend specific e-books of students’ interest	“Librarians could tell more about e-books when students ask for help.” “Give suggestions on recommendable e-books.” “Recommend the best one for whatever we're searching for.” “Answer any and every question you have.” “Be more informed of all their books in store.”

Help in searching and using e-books	“Showing us [students] how to find them.” “They could be there to answer any questions about where to find or how to look up an e-book.” “Possibly setting up a tutorial.” “Having e-book tutorial nights where students can sit in on a day class to hear about how e books work.”
More available and proactively approach students	“Be more available and approach students.” “Possibly station a librarian on every floor.”

Table 9. Features of e-books

#	Feature/Operation	Min	Max	Mean	SD
1	Bookmark pages	1	13	9.25	3.23
2	Copy text	1	13	8.93	3.63
3	Search across full text	1	13	8.72	3.37
4	Highlight text	1	13	8.44	3.33
5	Annotate	1	13	8.10	3.48
6	Print page or chapter	1	13	6.90	3.36
7	Browse index or table of content	1	13	6.83	3.83
8	Download chapters separately	1	13	6.64	3.58
9	Have a read-aloud option	1	13	6.35	3.79
10	Translate to other languages (Spanish, French, Russian, etc.)	1	13	6.26	3.43
11	View high resolution images	1	13	6.16	3.53
12	Link from indices to text	1	13	5.70	3.72
13	Share text using social media	1	13	3.97	3.06

Table 10. Mapping factors on relevant hypotheses

#	Activities that Could Increase the Use of e-books by Students	Relevant Hypothesis
1	Build a more positive, utilitarian and hedonic image of libraries	H1: Organizational environment for information technology
2	Actively involve students in the selection and management of e-books	H2: External locus of control
3	Maintain a diverse collection of e-books	H1: Organizational environment for information technology
4	Purchase e-books with features preferred by students	H5: Information technology features
5	Publicize and promote the existing collection for more visibility among students	H1: Organizational environment for information technology
6	Develop a user-friendly library website for better findability of e-books	H1: Organizational environment for information technology

7	Provide a student-centered experience for using e-books	H1: Organizational environment for information technology
8	Ensure the presence of knowledgeable and approachable librarians to address students' issues related to e-books	H1: Organizational environment for information technology

Figure 1. Proposed theoretical model

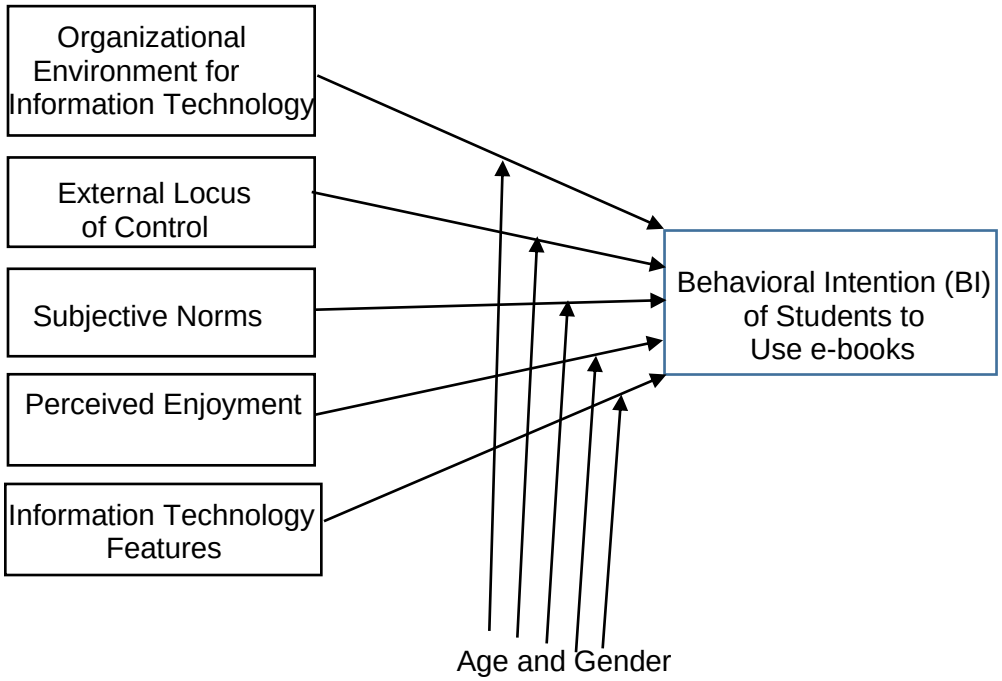

Figure 2. Path diagram of behavioral intention to use e-books by students

