Research Article



Exploring the Standardized Root Mean Square Residual (SRMR) of Factors Influencing E-book Usage among CCA Students in the Philippines

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ABSTRACT

Early adopters of e-books claimed that e-books encouraged reading, and served as a means of improving individual academic performance. This appears to be unnoticed by academics in the Philippines. Objectives: The primary goal of this work is to conduct a study reporting the standardized root mean square residual (SRMR) of factors influencing e-book usage among students and robustness of the Technology Acceptance Model (TAM). Design: The TAM criteria were used to design an online questionnaire survey focusing on the usefulness, ease of use perception, and attitude toward addressing the hypotheses to the structural equation model for using e-books. The questionnaire's validity was confirmed by four specialists. The participants are undergraduates at City College of Angeles, Philippines. A total of 348 responses was analyze with aids of SmartPLS version 3.3.2. Results show that these four factors are related to each other and have a strong influence on e-book usage and adoption. Also indicated that perceived usefulness (PU) is the most significant and perceived ease of use (PEU) indicated the least supported. A total 65% variance explained, SRMR < 0.08 NFI above 0.9 and RMS_theta < 0.12 achieved. Ultimately, a thorough analysis of the study is recommended for future researchers.

Keywords: Attitude; Ease of use; Usefulness; E-book; Mean square residual

1. INTRODUCTION

Until the introduction of e-books, printed materials or books were the major resources in every library. According to Arkorful and Abaidoo (2015), the wide variety of e-book utilization is due to its implementation as an educational tool, which aids in the students' search for knowledge by offering content relevant to various courses. Early adopters of e-books agree that it is a means of improving their abilities, making it much easier to find information, and encouraging reading (Varnes, 2020; Avineri et al., 2015). This is connected to the factors why e-book subscriptions are used as an electronic learning method (Liu et al., 2021). Likewise, Cheah et al. (2018) claimed that e-books are among the most helpful and valuable educational resources. It is a useful tool for developing skills as well as efficiently reviewing and accessing information. While compared to traditional print books, e-books may provide library users the same or additional benefits, such as keyword searching from a collection of books, browsing, search interfaces, extracting, analyzing the quality and relevance of the resources offered (Liu et al., 2021).

In today's world, technology is an integral part of every academic institution (Miranda et al., 2021). It aims to provide very quick, low-cost, and simple access that students can use to obtain information quickly and easily (Mutia & Cahyani, 2021). Technology has also played a role in the creation and provision of university student support. The United States is the greatest user and market in terms of global e-book reading trends. The English-speaking population was an early adopter of e-books even before the Amazon Kindle. The "Rest-of-the-World" had the second-highest number of users. Other than the US, UK, Canada, Australia, and Europe, 192 countries are examined in the study. In fact, the nations depicted are as follows: a) the United States; b) Canada; c) the United Kingdom; d) Europe; e) Australia; and f) the Rest of the World (ebook.com; Sarkodie & Strezov, 2019). The study stated, Australia (24 million) outnumbers both the United Kingdom (65 million) and Canada (34 million). Australians who like e-books may be influenced by brand loyalty, as the logo displayed to Australian visitors represents eBookS.com as 100 percent Austrian. Furthermore, according to a poll conducted in the United Kingdom, young people prefer to read on a computer screen rather than in a book or magazine. According to the survey, one-third of the new generation read fiction online and e-books using library apps (Mangan, 2017).

Individualization among university students may be accomplished by the use of e-books, according to Chen and Su (2019), who confirmed that utilizing the e-book system will increase university students' self-regulated learning, self-efficacy, and academic performance. Alfonso (2017) describes in detail that the students' knowledge, abilities, and positive attitudes toward the use of e-books in the Philippines ca6n be improved through awareness creation. The study revealed a slow rate of e-book adoption and suggested more research to raise awareness of the benefits and usefulness of e-books as an instructional learning process resource. However, the decision to conduct this study was based on previous and current recommendations.

As time progressed, the advantages of utilizing e-books became more important considerations in students' decisions to embrace e-books in the Philippines. Several studies support that digitization is important and may improve daily operations (Mangan, 2017, Liu et al., 2021). The desire to utilize e-books has an effect on postgraduate performance in Sri Lanka. The study also recommends replication using undergraduate students as the participants, since acceptance seems very slow even among postgraduates (Jayakananthan and Jeyaraj, 2019). However, the most influential factors in the study are the facilitating conditions and the perceived ease of use. E-books are dependable, affordable, and easy to use. Their accessibility for academic learning and teaching should be emphasised, particularly in the digital era, where new technologies are being developed to support education (Dado et. al., 2016). In the Philippines, analysis on variables that may increase acceptability and usage is required (Machete & De La Pena, 2019). According to studies, individuals embrace technology based on its usefulness, how it may enhance their daily tasks, and scientific explanation based on simplicity of use (Mutia & Cahyani, 2021, Mangan, 2017, Liu et al., 2021, Varnes, 2020. Thus, the aims of this present study were to: (a) provide information and literature on related works; (b) analyze and report the standardized root mean square residual (SRMR) of factors Influencing E-book usage among City College of Angeles students using the in-built algorithm and bootstrapping methods in SmartPLS 3.3.2 software; (c) investigate the robustness of the TAM factors, and (d) demonstrate the achieved structural equation model.

2. **RESEARCH METHOD**

2.1 Theoretical background

Pertaining to models and theories, the TAM and IDT are the most often used. TAM is a theoretical model that drives technology acceptance. Davis established it in 1986. According to Durodolu (2016), TAM is the most widely used and important model in studies on technology adoption and in the field of information science. TAM offers a perception for technological decisions and is widely used as a technology acceptance framework in most related previous studies. The theory explains that "actual system use" is the point where people become eager about using technology to consumers might influence their decisions to utilize the new technology. The factors were chosen based on the user's intention to utilize ebooks over time and how an individual's attitudes impact their behavioral intentions (Mafunda et al., 2016). Several studies have demonstrated that attitude plays a significant influence in shaping user decisions towards using e-books (Mustafa et al., 2021; Nazari et al., 2021). Most affirm that TAM is the simplest and most fundamentally helpful idea in terms of technology acceptance. Based on the most recent affirmation, TAM is the most effective analyst of behavioral intent to use an electronic-book and was considered to investigate the behavioral intentions of college students in the Philippines in this study.

2.2 Review of relevant studies

This section describes the study's theory as well as the existing studies in relation to the factors influencing students' behavioral intentions whilst using e-books. The definition of mathematical expressions concerning standardized root mean square residual (SRMR) and other ideas was also addressed. Behavioral intention refers to a person's attitude or how an individual behaves and acts in response to certain contexts and settings (Racero et al., 2020). The acceptance of technology by students is impacted by generational differences. Technically literate generations are those who may be comfortable enough to use modern devices or participate in digital learning. The behavior of these individuals differs greatly from the individuals without technology adoption or usage experience. In this case, the intention to use an e-book may be differently based on the relative advantage or influenced by perceptions related to ease of using it. According to Qashou (2021), one aspect to consider while analyzing technology adoption is attitude. According to Muhammed et al. (2016), intention is defined as a person's desire to try new things and create a strategy to accomplish the desire. Van (2017) stated that the desire to make a decision is connected to self-motivation. As a result, behavioral intention relates to a decision's ability and willingness to accomplish and accept new things, such as specific technology. Furthermore, behavioral intention refers to the motivating elements that influence a certain action; the greater the desire to carry out the behavior, the more probable it is to be attained (Schwarzer & Hamilton, 2020).

Recently, the adoption of electronic materials has dominated the learning resources of students all over advanced countries, while the Philippines is included among the rest of the countries embracing e-books. The publishing industry is on the verge of extinction. Students seem comfortable obtaining information from websites and screens, which may be connected to their refusal towards using the hardcopy materials. Then, students' willingness to use technology may be influenced if they are made aware of the benefits of using it (Cheah et al., 2018). Cheah et al. (2018) concluded that acceptance of e-books will lead to improved efficacy in learning and teaching in an efficient and accurate manner. Nazari et al. (2021) studied student behaviour in relation to acquiring information via the internet. According to the study, students also had no clue how to get the tools, websites, or e-documents to read, and acquiring reliable information might be difficult and frustrating. According to Joel (2020), in a study conducted in Nigeria, postgraduate students of the library and

information already have the highest familiarity with the usage of e-books. Kamble (2020) affirmed that perceived usage of e-books have an impact on the field of librarianship and its practitioners. Additionally, it was revealed that examining the usefulness of the research topics was relevant and significant. Bulur (2019) analyzes the factors that have an influence on students' attitudes towards e-books. The study's findings show that students' attitudes are based on how they perceive the adoption of technology. Haryani (2021) mentioned that students' attitudes depend on the need for innovation. According to Ormanci and Cepni (2020), social and cultural barriers linked to a person's location and time determine e-book utilization, and so do physical barriers related to the physical medium, or "e Readers," affect e-book readers. According to the study, making e-books more available aided users in growing accustomed to and appreciating the usage. According to the findings, cognitive barriers impact user decisions. This implies that user acceptance is determined by the user's comprehension, reasoning, and perception of e-book usage. Nevertheless, the majority of the studies stated that students' decisions are influenced by perception of the usefulness of the innovation. Acceptance might be driven by a desire to use the product in the future. Moreover, the aforementioned studies employed TAM as the foundation of their analyses. As a summary, the current study explored the use of TAM to depict the SRMR of factors influencing e-book use among undergraduate students, which might be useful to the academic database of existing studies on e-book acceptance.

2.3 Hypothetical statement

This study describes students' behavioral intentions regarding utilizing e-books in this section. The dimension involved investigating the role of easy of use perception, usefulness point of view, and attitudes concerning intent to use e-books (Vrabec, 2021). The authors developed the hypotheses using the TAM model factors and related literature on students' behavioral intentions to embrace technology and accept e-books. The following are references to related literature and topics that demonstrated the trustworthiness of the TAM factors in their studies related to intention to accept technology. These studies are considered to develop or replicate hypotheses to suit this study's objectives.

2.3.1 Attitude and intent to accept the e-book

The e-book has emerged as a new reading trend. According to studies, technology has a significant influence on society, including read books habits and the readers point of view in utilizing e-books. TAM factors has a significant impact on e-book adoption investigations and behavioral intention to use prediction. Adoption of e-books have grown in popularity among college and university students, and electronic reading is expanding which indicating a desire to use e-books as learning aids (Smeda et al., 2018). According to surveys, e-books have become the current reading phenomenon, yet there is little knowledge of the factors that influence users' views toward utilizing e-books (Lim et al., 2020, Makwanya & Oni, 2019). Previous studies show that attitude has a significant role in shaping students' behavioral intentions concerning technology acceptance such as e-books (Cheah et al., 2018, Lim et al., 2020, Joel, 2020). It is believed that the user's attitude influences his or her decision to utilize an e-book. Due to the format, lower cost when compared to printed books, and greater portability, e-books are advantageous to students. E-books are also simple to use and efficient. That is, students' attitudes were claimed to have influenced benefits such as ease of access via the e-book title (Liu et al., 2021). These findings have enabled the development of hypothesis one that; *there is a link between attitude and the intention of accepting e-book among the City College of Angeles students (H1)*.

2.3.2 Usefulness and intent to accept e-book

According to studies, employing technology improves the ease with which a user completes a given task. The usefulness and application of new technology is influencing the trend in free e-book downloads and the utmost authorized price of e-books. The expansion of electronic devices has resulted in an increase in downloads and enhanced individual awareness of copying useful parts of the text (Makwanya & Oni, 2019, Akuffo & Budu, 2019). Learning experiences influenced the usefulness of an information system, and user content influenced specific technological acceptance (Wang et al., 2020). According to the TAM model, perceived usefulness is the belief that utilizing specific technologies may improve a user's performance in a given activity. According to Merkle et al. (2013), existing studies on e-books emphasized on individuals' views of actual desire to use e-books in the setting of advanced countries. The perceived usefulness of the e-book may be used to create positive behavioral intentions and as a reference resource for teaching and learning purposes (Shiratuddin & Hassan, 2020). According to studies, users benefit from utilizing e-books for teaching, research, study, and access to a wide range of information (Lai, 2016; Akuffo & Budu, 2019; Letchumanan & Tarmizi, 2011). Considering the references, it is hypothesized that *there is a link between usefulness and the intent to accept e-book among the City College of Angeles students (H2)*.

2.3.3 Usefulness and attitude to accept e-book

Nayanajith (2019) argued that an attitude towards using a technology could be influenced by both usefulness and ease of use perception. According to studies, e-book users' preferences are affected by portability, convenience, and functional services like search and online storage, which encourages acceptability (Wang et al., 2020). The e-book has become an indispensable learning and teaching tool, and it appeals to users as a new technology to explore. Service trust has a significant positive impact on attitudes about adopting e-books (Kong et al., 2020). The perceived utility of an e-book has a noteworthy impact on users' intention to use it. E-books are digital materials that have been organized and structured and are made available for users to read and reuse on computers, mobile phones, and e-book players. Users believe that the benefits provided by e-books include being simple to use, helpful, and easily accessible, which contributes to user interest in e-book usage (Gómez Domingo, 2020). However, ease of use perception and utility of technology are basic dynamics influencing attitudes toward technology adoption (Islami et al., 2021). Similarly, Nuryanto et al. (2020) confirmed that

perceived relevance influenced the intent to directly utilize e-books. It is suggested that in order to enhance significant intent toward e-book adoption, individuals must feel a relative benefit or certainty that it would improve a certain behavior, profession or productivity. Thus, hypothesized that *there is a connection between perceived usefulness and the attitude to accepting ebooks among City College of Angeles students (H3).*

2.3.4 Ease of use and attitude to accept e-book

The ease of use of e-books is one of the reasons for its popularity and adoption among students. The perceived ease of use influences users' positive attitudes toward utilizing e-books. Furthermore, adoption eases accomplishing tasks more quickly (Kim et al., 2020). Tovstiadi et al. (2018) reported that students view e-books as simple to use and that it is more likely to be more simple for those who use it frequently (Hwang & Lai 2017). The study concluded that students believe technology enhances their work performance. Moreover, e-books can be readily searched and identified, which may lead to frequent usage (Hsiao & Chen, 2017). Chang et al. (2017) affirmed that one of the most significant advantages of e-books is the simplicity in term sourcing for references, especially once keywords or topic phrases are known. Kiilu (2019) argues that students prefer e-books due to characteristics such as research tools that make it easier to complete tasks (Shettar, 2017). According to Moslehpour (2018), perceived usefulness and perceived simplicity of use are important variables that may influence students' attitudes and behavioral intent to use e-books in the future. Indarsin and Ali (2017) reveal that perceived ease of use is more significant than perceived usefulness in determining attitude and behavioral intention. These studies believe that there is a relationship between perceived ease of e-book use and the attitude towards usage. As a result, hypothesized that; *there is a correlation between ease of use and students' attitudes toward accepting e-books at City College of Angeles (H4)*

2.3.5 Ease of use perception and usefulness to accept e-book

The effect of perceived ease of use was more pronounced than the effect of perceived efficacy. The specific technology adoption process is built on these two elements in this study. According to Nayanajith (2019) and Salloum and Shaalan (2018), perceived benefits of use and convenience of use are typical variables that may drive intent to use technology such as e-books. According to Huang et al. (2017), faculty embraced e-books as a result of the decision to seek information, and thus motivated students to utilize technology as a means of learning. Perceptions of relevance and ease of use influenced attitudes toward e-books' acceptance. Studies found that students' opinions of e-books as helpful and simple to use had an influence on their intention to use the technology (Gelderblom, 2019, Nugroho et al., 2018). Boczar and Pascual (2017) affirmed that e-books aid students in completing their research, projects, and assignments. In a study on the effect of trust in mediating usefulness perception and ease of use in buying an e-book, Yudiarti and Puspaningrum (2018) reported that buyers accept e-books based on the perceived utility and ease of use. Based on the findings of an area of information behavior and an adopter experience in the academic e-book environment, Tracy (2018) claimed that e-books are used for both reading and reference. Based on the previous analysis and recommendation, this current study hypothesizes that *there is a relationship between perceived ease of use and perceived usefulness in using e-books among the City College of Angeles students(H5)*.

2.3.6 Ease of use and intent to accept e-book

Students' perspectives on the usefulness and experiences of e-books influence their intention to use it on a regular basis (Venkatasubramanian & Anifa, 2018). According to studies, the relative benefit of utilizing an e-book influences user behavioral intentions or readiness to adopt it (Liao et al., 2018, Salloum & Shaalan, 2018). These studies imply that the finding that students' perceptions of a specific technology's usability may be a significant predictor of students' behavioral intentions to adopt or use technology should be replicated in future studies to establish the findings' generalizability. Apuke and Iyendo (2018) indicated that participants who have a very positive attitude about using e-resources have a high behavioural intention, and perceived utility impacts attitude. However, Hussen (2017) argued that perceived usefulness is a more important driver for predicting students' intention to use technology, while perceived ease of use has a strong impact on students' attitude towards e-learning. Thus, this study hypothesized that *there is a relationship between perceived ease of use and intention to accept e-book among the CCA students (H6)* in accordance to the previous studies' findings and recommendations.





Conclusively, figure 1 shows the hypothetical conceptual framework and presentation of the study's analysis followed by the subheading "results of the study."

2.4 Research design

A descriptive-quantitative method was used in this study, as well as reflective indicators and structural equation modeling. To investigate one or more factors, descriptive research can use a wide variety of research methods (Atmowardoyo, 2018). The descriptive-quantitative method was used to assess students' intentions, attitude and perception towards using e-books. A survey method was used to gather the data. As it is a reflective construct, confirmation through the use of factor analysis (i.e. convergent and discriminant validity) and reliability testing (i.e. Cronbach's Alpha) based on construct indicators (attitude, perceived usefulness, ease of use) are considered to express the relationship among the factors and the standardized root mean square residual (SRMR) of factors influencing the intent of City College of Angeles students to use an e-book. This study targeted the entire student population from the departments at City College of Angeles, which included participants from the Institute of Computing Studies and Library Information Science (ICSLIS), the Institute of Business and Management (IBM), and the Institute of Education, Arts, and Sciences (IEAS) that are currently enrolled for the Academic Year 2020-2021. The respondents considered the best fit for the objectives of the study due to previous studies' recommendations and the current situation that called for digital education. A total of 348 responses were gathered through the use of a designed Likert scale Google form questionnaire covering intention to use an e-book, attitude, perceived ease of use, and perceived usefulness with the use of a convenient sampling methods.

2.5 Questionnaire development

Questionnaires are used to gather, measure, and evaluate data relating to the study (DePoy & Gitlin, 2019). The integrity of the questionnaire must be designed to minimize bias and ensure that the survey measures just what claims to measure (Ullrich &Strong, 2021). The questionnaire was structured, verified, and validated by the Dean of the Institute of Computing Studies and Library Information Science, as well as the Vice President for Research at the College of Angeles. The director of the Center for Research and Publication at Baliuag University, Philippines. Finally, the Head of the Department of Business Administration at Gombe State University in Nigeria. Google Forms are one of the finest tools researchers can use. Thus, this study utilized a customized Google Forms questionnaire to obtain from the three institutes of the City College of Angeles since it is a simpler and faster method to collect data in the midst of the pandemic.

2.6 Research instruments f and data collection

Questionnaires are used to gather, measure, and evaluate data relating to the study (DePoy & Gitlin, 2019). The integrity Data collection is the action of gathering and measuring answers to research questions accurately, validating the study, findings, objectives, or the study's hypothesis (Sun et al., 2019; Kalayci et al., 2020). The researchers depended on important information obtained by the use of surveys in Google Forms, which were also considered in this study. The Likert scale is one of the most frequently and most fundamentally used psychometric tools in research. It is a widely used analytical scale to obtain feedback (Kandasamy, et al., 2020). Willits et al. (2016) state that it is a classic method for measuring attitude, which is relevant in this study since attitude is one of the factors to investigate in this study, and it aims to statistically analyze the influence of e-books on CCA students. The respondents offered a scale to indicate their view in terms of strongly disagreeing or strongly agreeing with the presented circumstances. To suit the objectives of this study, a 5 point Likert scale was used to determine the standardized root mean square residual (SRMR) of factors influencing e-book usage and demonstrate the Bootstrapped and Algorithm structural equation model in the context of City College of Angeles students. In this study, the recommended Likert scale to accurately measure the factors, including attitude, intention, ease of use, and usefulness, formed 1 as strongly disagree, 2 as disagree, 3 as neutral, 4 as agree, and 5 as strongly disagree. Meanwhile, the proposed items' reliability and validity in relation to the theoretical framework were investigated. The SmartPLS 3 Algorithm and bootstrapped-based parameters were utilized to evaluate the measuring scale's validity, which included construct reliability and validity as well as discriminant validity. Furthermore, fundamental statistics such as sample mean standard deviation and model fit were used in the study with structural equation modelling. Thus, the mathematical representation of the research in SmartPLS included Standardized Root Mean Square Residual (SRMR), Exact Model Fit, Normed Fit Index (NFI), also known as Bentler and Bonett Index, Chi2 and Degrees of Freedom, and RMS theta Fit Measures (Krebsbach, 2013). In a nutshell, the analysis and results are predicated on 348 survey responses from City College of Angeles students. The data was collected from March to July 2021 from the CCA students in the academic year of 2020-2021. A letter of approval and an invitation were issued to CCA's three Institute Deans: ICSLIS, IEAS, and IBM, in order to collect data. To make it easier for participants to access and participate in the study, the Google survey forms were shared to them through messenger and email.

2.7 Analysis and analytical tool

SmartPLS 3 above was utilized in this study to identify the most significant among perceived ease of use, perceived usefulness, attitude, and intention of using e-books. Several investigations found the software to be trustworthy and reliable in terms of structural equation modeling studies (Cheah et al., 2020; Yalung et al., 2020). Fit values such as SRMR, Normed Fit Index (NFI), Degrees of Freedom, and RMS theta are provided by SmartPLS to justify model fit (Hair, Hult, Ringle, & Sarstedt, 2021, Krebsbach, 2013). In addition, the bootstrapping approach was utilized to determine the importance of the path coefficients and loading (Ramayah et al., 2017). Nonetheless, the analytical tool used in this study, SmartPLS 3, proved

to be dependable and satisfactory in terms of mathematical expression, charts, and graph representations (Hair, Hult, Ringle, & Sarstedt, 2021).

The reliability and validity of a study instrument are crucial parameters to explore. The quality of an instrument to evaluate consistency is referred to as reliability, whilst the quality and coherency of an instrument is referred to as validity. Cronbach's Alpha and Composite Reliability are the two metrics used to determine the instrument's reliability and validity. Cronbach's Alpha is well recognized as one of the most often used objective indicators of reliability. It is used for testing and determining scale consistency (Clark & Watson, 2019). Composite Reliability, like Cronbach's Alpha, assesses validity and reliability while emphasizing interconnectivity variables (Roman et al., 2020). Both Cronbach's Alpha (Alpha) and composite reliability (CR) can be used at the same time to determine the reliability and validity effectively. The value must be 0.7 or higher before being categorized as reliable (Marliana & Nurhayati, 2020, Yusoff et al., 2020). According to Dos Santos and Cirillo (2021), average variance extracted (AVE) was widely employed to validate constructs. It is a calculation of the overall amount of variation acquired by a construct in relation to the amount of variance due to measuring errors. Each construct may be obtained by dividing the sum of squares of completely standardized item loadings by the total error of variance for indicators (Alarcon, 2015). AVE assesses the amount of variation recorded by the construct relative to the level attributable to measurement error, with values above 0.7 regarded extremely excellent and those within 0.5 to 0.6 above considered acceptable. and below 0.5 is unacceptable (Husin & Mohamed, 2021). As previously stated, this is a quantitative and PLS-SEM route model with reflectively assessed components (i.e., common factor models). As a result, the fundamental computations and model fit statistics included sample data. The meaning of the word "mean" is defined as the average of a set of n data points, which can be represented mathematically as:

$$\overline{x} = \frac{\sum x_i}{n}$$

The standard deviation is the most often used measure of data spread or dispersion around the mean. The square root of the variance is used to calculate the standard deviation (V). The variance is calculated by dividing the total of the squared departures from the mean by n-1. Functionally, this is defined as;

$$s = \sqrt{\frac{\sum (x_i - \overline{x})^2}{n - 1}}$$

Standardized Root Mean Square Residual (SRMR), the SRMR index's permissible range is between 0 and 0.08 (Hu and Bentler, 1999). Because the majority of the components in the SRMR formulation are just the MSE of estimated and observed correlations, 0.08 may be regarded as reliable. This was determined to be important in supporting the matrix and the value of the criteria utilized in this investigation. The Normed Fit Index (NFI), also known as the Bentler and Bonett Index, is an incremental assessment of a statistical model's goodness of fit that is unaffected by the number of parameters or variables in the mode. NFI is defined as the present model's relative position between the saturated model with TS = 0 and the independence model TI. NFI has a value between 0 and 1, and a number close to 1 indicates a good match (Brownell, Chartier, Santos et al., 2012). This section is linked to the mathematical formulas contained in the SmartPLS Algorithm and Bootstrapping section. Chi² and Degrees of Freedom, a chi-square (χ 2) statistic is a measure of the difference between the observed and expected frequencies of the outcomes of a set of events or variables. χ 2 depends on the size of the difference between actual and observed values, the degrees of freedom, and the samples size. The degrees of freedom (df) are specified as (K2 + K) /2 – t, and the Chi-Square formula is

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where = Degrees of freedom E = Expected value, O = Observed value (s) (s) When attempting to comprehend the significance of a Chi-Square test and the validity of the assumptions, it is critical to compute degrees of freedom. Thus, we discovered significant in our investigation, which was accomplished with the assistance of the aforementioned statistical technique. RMS theta is often calculated using the outer model residuals, which are the discrepancies between anticipated and observed indicator values. In PLS-SEM, the latent variable scores are commonly used to estimate the indicator values. RMS theta values less than 0.12 suggest a well-fitting model, whereas values more than 0.12 indicate a discrepancy (Henseler et al., 2014).

3. RESULTS AND DISCUSSION

3.1 Results of the Study

Table 1 shows the demographic details of the respondents. Based on the collected data, it reveals that 64% of the respondents are female and 36% are male. It shows that most of the respondents are more from IBM with a percentage of 51%, while ICSLIS of 31%, and IEAS of only 18%.

Table 1.	Demographic	details	(Pineda e	et al., 2021
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Factors	Categories	Frequency	Percentage
Gender	Female	221	64%
	Male	127	36%
	Total:	348	100%
Institute	ICSCLIS	108	31%
	IBM	178	51%
	IEAS	062	18%
	TOTAL	348	100%

Note the Acronym: Computing Studies & Library Science (ICSLIS), Business and Management (IBM), and Education, Arts, and Sciences (IEAS).

3.1.1 Analysis of reliability and validity

The advent of SmartPLS, a full software package with a user-friendly graphical user interface, has increased adoption due to generalizability reports from studies (Sarstedt & Cheah, 2019). SmartPLS offered four assessment findings to determine the convergent validity of the measurement model: Cronbach's Alpha, rho A, composite reliability, and average variance extracted (Masrek & Samadi, 2017). SmartPLS 3 is capable of doing the computations required for the model parameters like mean, t-test, probability value and estimation of standardized root mean square residual (Becker et at., 2018). SmartPLS 3 measures instruments through various factors and focuses on the factors of interconnection (Roman et al., 2020, Penney & Burke-Miller, 2021). The Cronbach's Alpha should be greater than 0.7, the Rho-A should be greater than 0.7, and the composite reliability should be greater than 0.7. Then, convergent validity and construct reliability are assumed to be dependable for structural equation modeling (Masrek & Samadi, 2017, Evermann & Rönkkö, 2021). In addition, some studies argue that the values of accepted alpha should fall between 0.70 and 0.95 (Penney & Burke-Miller, 2021; Chretien et al., 2020). Meanwhile, the average variance extracted (AVE) should be greater than 0.5 (Ahmad et al., 2016, Masrek & Samadi, 2017). Henseler et al. (2015) mentioned that discriminant validity indicates measurements that are not related to reality. The discriminant validity with the use of the heterotrait-monotrait ratio is based on a 0.85 proposed threshold. As a result, the items in the factor loading were found to have a high level of reliability and accuracy as shown in Table 2.

Table 2: Measurement Items	Retained	(Pineda et al., 2021)
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Codes-Construct Reliability and Va	lidity			
Retained Items	Factor Loading > 0.6	Cronbach Alpha > 0.7	Composite Reliability > 0.7	AVE > 0.5
Intention				
I have the intention of using e-books rather than printed books.	.849	.934	.950	.791
I have the intention of using e-books since they are cheaper than printed books.	.905	_		
I have the intent of using e-books because it is more convenient to use.	.904	_		
I intend to use e-books in my daily tasks.	.876	_		
I intend to use e-books in the future, since they are more accessible than printed books.	.911			
Perceived Ease of Use				
I think e-books are easier to use than printed books.	.839	.924	.943	.768
I think e-books are easy to navigate.	.876	_		
I believe e-books can easily give a variety of information.	.908	_		
I think I can easily find relevant information for my studies using e-books.	.895	_		
I think e-books are accessible using any gadget.	.863			
Perceived Usefulness				
I think e-books are as useful as printed books.	.886	.948	.960	.828
I think e-books are useful as reference material.	.918	_		
In my opinion, e-books are useful for reading purposes.	.912	_		
I guess e-books are useful for learning purposes.	.922	-		
I believe that e-books are useful through open search engine features.	.911	-		
Attitude				
E-books, in my opinion, are good.	.885	.943	.956	.813
E-books, in my opinion, are desirable.	.912	_		
I believe that using e-books is effective.	.913	_		
I believe that reading E-books makes me more literate.	.892	_		
E-books are enjoyable in my perspective.	.906	_		

Cronbach alpha values in Table 2 were all more than 0.9 recommended (Hair et al., 2021, Henseler et al., 2015), with the highest being 0.948 and the lowest being 0.924. Similarly, the composite reliability reported 0.943 as the lowest value achieved and 0.960 as the highest value, whereas the average variance extracted reported 0.768 as the lowest value achieved and 0.828 as the highest, indicating that all of the average variance extracted was above the recommended 0.5 threshold (Hair et al., 2021, Henseler et al., 2015). Twenty of the twenty items were retained. None of the variables were deleted; the items were all statistically justified and relevant.

3.1.2 Validity of structural measurements

Assessing correlations between latent variables, discriminant validity evaluation has become a widely acknowledged requirement. The Fornell-Larcker criterion and the study of cross-loadings are the most common methodologies for evaluating discriminant validity in variance-based structural models, such as partial least squares and reporting the standardized root mean square residual studies (Henseler et. al. 2015). Discriminant validity among the constructs investigated with the use of the Fornell-Larcker criterion was achieved (Kirezli & Arslan, 2019). The discriminant validity was also confirmed through AVE values for each item, which is greater than any correlation among any item pairings (Hair et. al, 2019). Thus, the discriminant validity of this study was evaluated in accordance with the Fornell & Larcker criterion and reported in Table 3 of this study.

Table 3: Fornell-Larcker Criterion				
Factors	Att	Inte	Inte	Pu
ATT	0.841			
INTE	0.836	0.816		
PEU	0.799	0.786	0.729	
PU	0.785	0.664	0.661	0.510

Noted: ATT = Attitude, INTE = intention, PEU = perceived ease of use, PU= perceived usefulness.

3.1.3 Bootstrap report: path coefficients

The bootstrap method generates statistical conclusions such as confidence intervals, average error and bias estimates, and hypothesis tests without the use of assumptions like normally distributed or equal variances (Knief & Forstmeier, 2021). Regardless of the statistic being computed, the bootstrap employs the same fundamental technique, and the application capacity includes in-built specific formulas to just provide model fits in terms of standard deviation, standardized root mean square residual (SRMR), the NFI, Chi², and RMS theta (Hair et al., 2021, Henseler et al., 2015, Hassan & Haque, 2016, Henseler et al., 2014, Brownell, Chartier, Santos et al., 2012, Hu and Bentler, 1999). Nonetheless, the standard deviation, t-statistics, p-values, variance explained, SRMR, and RMS theta were utilized to support the path coefficients and structural equation model obtained using the bootstrapped procedure of modeling. Table 4 demonstrates the achieved values. Meanwhile, reports on the SRMR and the RMS theta and variance explanations achieved will be reported in the latter part of this study.

Factors	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics (O/STDEV)	P Values
ATT -> INTE	0.173	0.171	0.063	2.737	0.007
PU -> INTE	0.202	0.205	0.054	3.730	0.000
PU -> ATT	0.431	0.429	0.062	7.008	0.000
PEU -> ATT	0.434	0.436	0.061	7.072	0.000
PEU-> PU	0.746	0.745	0.037	20.297	0.000
PEU ->INTE	0.494	0.493	0.055	9.005	0.000

Table 4 demonstrates that attitude -> intention with p values of 0.007, supporting the first hypothesis that there is a relationship between attitude and intention to accept e-books among City College of Angeles students, with p < 0.05. This shows that CCA students' attitudes have a substantial positive impact on the intention to use e-books. As a result, the result obtained is significant.

The hypothesis (H2) that there is a link between perceived usefulness and the intention to accept e-books among City College of Angeles students supported in this study, with p values of 0.000, where p < 0.05. This indicates that CCA students' intentions to utilize e-books are significantly influenced by their opinions of usefulness. As a result, the study indicated that the impression of usefulness would impact the intent to utilize e-books.

The third hypothesis presented in this study was that *there is a link between perceived usefulness and the attitude toward accepting e-books among City College of Angeles students*, and the anticipated value should be p < 0.05. A p value of 0.000 was found to support the perceived usefulness regressed on attitude. This demonstrates that students' perceptions of usefulness have a significant impact on CCA students' attitudes regarding utilizing e-books. As a consequence, the findings were determined to be statistically significant.

The fourth hypothesis given in this study was that there is a link between perceived ease of use and willingness attitude towards acceptance of e-books at City College of Angeles, with the anticipated value also being p < 0.05. The study revealed that the perceived ease of use regressed on the students' attitude, was confirmed by a p < 0.000. This means that students'

perceived ease of use has a significant impact on CCA students' attitudes toward utilizing e-books. As a consequence, the assumption proven to be statistically significant to the study's objective was accepted.

One of the goals of this study was to look at the effect of perceived ease of use on perceived usefulness in the relationship with an attitude towards e-book acceptance, and the value found to be supported by a probability value of less than 0.000 (p < 0.000). This implies that there is a relationship between perceived ease of use and perceived usefulness to accepting e-books among the City College of Angeles students indirectly, since the probability value is less than 0.05. In a nutshell, this demonstrates that students' perceived ease of use in the relationship with perceived usefulness towards utilizing e-books was statistically reported to be most significant model in this study and consistent with previous related studies (Nugroho et al., 2018, Salloum & Shaalan, 2018, Gelderblom, 2019).

The sixth hypothesis, supported by a p value of 0.000, is that there is a relationship between perceived ease of use and the intention to accept e-books among the City College of Angeles students. The results indicated a probability value less than 0.05. This shows that students' perceived ease of use has an outstanding influence on CCA students' intention to use e-books. As a result, the study found significance. All expressions and rationalizations are based on the basic sample mean, standard deviation, and p-value 0.05 in this section.

Furthermore, SmartPLS software version 3.0 was used to validate the variance explained, loading estimates, and tstatistic of the structural equation model. Meanwhile, figure 2 shows the t-statistic on the inner arrows, which was deemed significant at ± 1.96 values above and a loading estimate greater than 0.6 for the measurement items considered in the Algorithm model. According to statistics, CCA students are strongly influenced by ease of use, usefulness, intention, and attitude towards using e-books.



Figure 2: Algorithm Report (Pineda, et al., 2021)

Figure 2 reported a total variance explained of 65% for the attitude model and 56% for the usefulness perception model. The Algorithm model also indicated a variance explained of 65% for ease of use, attitude, and usefulness towards the intent to use e-books among the CCA students. Conclusively, all independent factors towards reliability could be interpreted as good predictors for e-book acceptance. Meanwhile figure 3 illustrated pvalue achieved



Figure 3: Bootstrap model (Pineda et al., 2021)

Nonetheless, this study's bootstrapped report shows the structural equation model with the supportive items loading, the SRMR, and RMS theta of the factors influencing e-book acceptability by CCA students presented in the figure 3 bootstrap model.

However, table 5 provides the statistical justification for the model fit with the mathematical representation of the research is a standardized root mean square residual (SRMR) value of 0.039, which justifies a good fit since the recommended range for the SRMR index is between 0 and 0.08.

Parameters	Fit recommendation	Estimated Model Achieved
SRMR	< 0.080	0.039
NFI	> 0.90	0.925
RMS Theta	< 0.12	0.11

Table 5: Model Fit Summary (Pineda et al., 2021)

The critical cutoff values for inferential statistical tests were justified with Chi² and degrees of freedom. Supportively, NFI values above 0.9 usually represent an acceptable fit and 0.12 is recommended for RMS theta (Hair et al., 2021, Henseler et al., 2015, Hassan & Haque, 2016, Henseler et al., 2014, Brownell, Chartier, Santos et al., 2012, Hu & Bentler, 1999, Krebsbach, 2013). This study achieved 0.925 and 0.11 respectively.

These findings have enable development of a solid understanding of attitudes toward e-books readers (Smeda, et al, 2018). The findings of this study supported the TAM's robustness and stability in connection to students' intents to use some e-books. On the basis of the mathematical analysis and expression in this study, the structural equation model achieved is considered fit.

4. CONCLUSION

The findings will aid researchers, librarians, students, and academics in terms of the influencing aspects associated with proving the significance of e-book utilization, and will serve as a guide towards increasing awareness for potential users. This concluded study hopes to assist academic institutions in understanding the significance of perceived ease of use, attitude, intention, and usefulness perception of utilizing e-books in the development of information management. It will also help teachers and librarians to encourage the use of e-resources such as e-books in order to improve their performance more efficiently and effectively. The study's findings could be utilized to increase the usage of e-books, resulting in improved information literacy and transmission regarding e-books, which in turn add value to the industry. This analysis also encourages the users to conveniently explore the material by utilizing multiple references, and this will increase the e-book industry's expansion. It assists libraries in transmitting accurate and trustworthy information across all industries, platforms, and media throughout the world. E-books have features that allow users to search for phrases and words, bookmark webpages, highlight keywords, alter font size, and employ interactive multimedia such as oral reading, images, music, and audio effects. This study was initiated by researchers in order to offer current literature and update the database on factors influencing students' intent to use e-books. A standardized root mean square residual (SRMR) and RMS theta values are also provided as statistical support for the model fit with the graphical representation of the study.

TAM focuses on the concept of adopting new technology. The theory of technology acceptance model includes variables suggested to investigate CCA students' attitudes and intentions regarding e-books acceptance in this study. According to the findings, the four suggested TAM factors, namely ease of use, intention, attitude, and usefulness, are all correlated. The SmartPLS 3 has been used to evaluate hypotheses. The path coefficient analysis significance level was based on a p < 0.05 threshold. The model fit was based on variance explained, SRMR, NFI, and RMS theta estimates. The analysis confirmed that all hypotheses were statistically proven to be significant. Hence, perception of ease of use in correlation to usefulness was considered the most critical factor influencing e-book use among students, whereas attitude regression towards intent to use e-books was statistically identified as the least significant in this study. The analysis confirmed that all hypotheses was considered the most critical factor influencing e-book use among students, whereas attitude regression towards intent to use e-books was considered the most critical factor influencing e-book use among students, whereas attitude regression towards intent to use e-books was statistically proven to be significant. Hence, perception of ease of use in correlation to usefulness was considered the most critical factor influencing e-book use among students, whereas attitude regression towards intent to use e-books was statistically identified as the least significant in this study.

RECOMMENDATIONS

The study's scope has been narrowed to the TAM factors, which are known to have a significant influence on the findings. However, the innovation diffusion theory (IDT) model has more measures and is related to innovation acceptance. The IDT model may be considered in future related studies. Another likely limitation is the adoption of SmartPLS 3 as the main analytical tool used in the study to define the relationships between factors and structural equation models. Thus, other statistical tools may be adopted in future studies to confirm the findings. Another challenge is finding updated related literature in the context of the Philippines. A significant amount of research is done in the settings of advanced countries, although this is considered as the gap between the studies, resources and reference are affected. Additionally, it is considered as a cross-sectional study with factors connected to it at a certain period in time, which is an obvious shortcoming compared to longitudinal studies.

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AUTHOR'S CONTRIBUTIONS

All authors discussed the results and contributed to from the start to final manuscript.

CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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