# Factors Affecting the Acceptance of Electronic Books by the Readers

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**ABSTRACT**

**Purpose**

One of the main questions about the future of print and electronic books is whether the second will replace the first. Although the electronic book was first introduced to the public in 1971, the trend of reading e-books did not gain popularity until the previous decade. The recent introduction of e-book devices has drastically changed the way people access and use the reading content. Therefore, in the present study, the electronic book is examined not only as an innovative technological product, but also as a cultural commodity. More specifically, the present study aims to develop and empirically test a conceptual framework (research model) that sheds fresh light on the factors that affect e-book adoption by the readers.

**Design/methodology/approach**

The examination of the proposed conceptual framework was made with the use of a newly-developed structured questionnaire that was distributed to book readers residing in three EU countries. In particular, the participants of the survey were citizens from Austria, France and Greece. The study includes nine research factors. Some of them are dependent (e.g., "perceived usefulness", "perceived ease of use", "perceived trust"), while the two main dependent factors of this study are "attitude towards use" and "behavioural intention". The empirical data were analysed using the "Structural Equation Modelling" (SEM) technique.

**Findings**

Empirical results revealed that the factors that have the most significant impact on e-book acceptance, both directly and/or indirectly, are three: "compatibility with the preferred way of reading", "ease of use" and "attitude towards use". Also, the results highlighted interesting differences between the three countries of the sample.

**Research limitations**

A limitation stemming from the implemented methodology is the use of self-reported scales in order to measure the constructs of the proposed model. Also, the paper lacks a longitudinal approach, since it provides a static picture of e-book acceptance (first quarter of 2019).

**Originality/value**

It is of great significance that everyone who has a stake in the adoption of e-books by the readers, understands which factors are the most significant. In that way, the publishing houses, the e-reader manufacturers and the software developers, will be able to approach their consumers more effectively. The present study offers guidelines to these organisations, thus enhancing their understanding about the perceptions of their customers. Moreover, the present study is conducted on a European level (sample from three EU countries), something that has never been attempted before in the relevant literature.

## 1. Introduction

Books are one of the very few things we have been working on since the beginning of our lives. Having been extensively used in order to teach children, everyone has at least some reading experience from a printed book (Chartier, 2004). But the same cannot be said for e-books. Since the first e-book, in 1971, as the

product of Project Gutenberg, the first digital library till today, e-books have gone through many stages. Nowadays books are going through their most challenging stage, since they are about to be the main way of reading literature and essays (Anton *et al.*, 2013; Lebert, 2009).

Although, the digital transformation of our society is happening, the e-book has not been established in our everyday life, such as the use of mobile and computer. This may have been partially due to consumer's unwillingness to give up the tactile reading experience associated with traditional books (Armstrong, 2008; Torres *et al.*, 2014).

The present paper will try to take a step towards a more differentiated view on e-book acceptance. The main theories on the acceptance of e-books are the Technology Acceptance Model (TAM) and Innovation Diffusion Theory (IDT) (Lai and Chang, 2010; Chang *et al.*, 2012). These models suggest variables that are related to acceptance. Based on these two models, many researchers have attempted to identify which variables affect acceptance and what kind of effect they have. The main factors examined are: Perceived Utility, Ease of Use, Perceived Discontent, Brand Trust, Behavioral Intention and Attitude of Use.

By examining the term "acceptance", it is concluded that it is quite a general concept and, therefore, an attempt has been made to make it concrete, so that it can be investigated. The most popular, commonly used models are the Technology Acceptance Model and Innovation Diffusion Theory (Chang *et al.*, 2012; Lyytinen and Damsgaard, 2001; Sheppard *et al.*, 1988). TAM, proposed by Davis (1989) argues that acceptance of new technology is influenced by Perceived Utility and Easy of Usability (Davis, 1989). Considering that e-books introduce a new technology, this model can effectively examine their acceptance. According to Diffusion Theory of Innovation, there are specific factors that can influence one's attitude before adopting and innovation. These factors are the relative advantage, compatibility, complexity, testability and observability (Rogers, 2003).

In the international literature, the main factors related to acceptance are: Perceived Utility, Ease of use, Perceptible Discontent, Trust Brand, which are usually considered as independent variables and Behavioral Intent and Attitude in Usage, which are usually considered as dependent ones.

Perceived usefulness can be defined as "the consumer's perception of the degree of utility in the use of e-book" (Tsai, 2012). Ease of use is often defined as "the consumer believes reading e-books is easy and does not require effort" (Gerlach and Buxmann, 2013). Perceived discontent in the case of e-books is defined as "the perceived discontent experienced by a person because an object has a different feel to the one he is accustomed to" (Gerlach and Buxmann, 2011). It has been observed, for example, that prolonged reading of e-books tire readers, resulting in increased dissatisfaction (Borchert *et al.*, 2009).

Brand trust not only refers to the brand of the reader (the device), but also to the overall e-book package, that is, the reputation of the book's purchasing website, the service and the security that the consumer feels when buying. It has been observed to directly and positively affect the market intent (Tsai, 2012).

Behavioral Intention is defined as "the degree of willingness to adopt new technology". It is considered the last and most representative variable to measure acceptance (Tsai, 2012). The attitude expresses "positive or negative emotions or assessment when someone uses a new information technology (IT)". The attitude successfully measures the intention and has been observed to depend on factors such as ease of use and perceived utility (Tsai, 2012).

Although, many studies have been written on e-books and the possible upcoming replacement of printed books, the scientific investigation on their acceptance by the readership remains incomplete (Park *et al.*, 2013). The reasons for this are two: Firstly, surveys usually focus on university libraries and student experiences, so the results are difficult to generalize in the general population, which differs substantially in terms of how and why e-books are used. Secondly, many researches approach the subject from a purely technological base, studying factors such as utility, ignoring that the book is a cultural asset (Lee *et al.*, 2002; Gerlach and Buxmann, 2013).

In summary, this paper is one of the most comprehensive reviews of e-book acceptance, because it does not only recognize the factors that affect the acceptance of e-books, but is also conducted on a European level. The countries that participated in our survey are: Austria, France and Greece. This research could contribute to many European organisations (publishers, reader manufacturers and developers of e-books), because if these companies understand what factors are the most important for European readers, they will be able to reach and satisfy them more effectively.

## 2. Literature Review

Books are an everlasting medium for more than 500 years, but since the last century there is a lot of competition. The generation of today has no time for conscious reading. They get their daily information over the internet, check their mails several times daily, watch their favourite series over their streaming service and either shop over the internet. The electronic book offers nearly the same possibility as the internet: quite adequate space for various sorts of texts (Tellioglu, 2018; Vasileiou *et al.*, 2008).

By definition, e-book means a "digital book publication", which is available on a digital or mobile device or a personal computer (Lee, 2012; Shin, 2011).

If you add some links to your device it is called an enhanced or enriched e-book, which describes the extraordinary aspect that you can read an electronic book accompanied by visuals like audios and videos. For this purpose, e-books offer a great opportunity to learn new languages (Siegel, 2009). Digital books are identified with their ISBN (International Standard Book Number) - same as traditional books.

When thinking of an e-book, at first it seems simple to tell what makes it what it is: Just a regular book or text in a digital format, which can be read on any electronic device with a screen. Nevertheless, there are two very important characteristics that have to be fulfilled in order to be a real e-book:

*Editability:* An e-book should not be editable. If you think

of an actual paperback book, it is the same thing. You cannot just take one and change any content, the format, the layout or the sequence of the chapters. Exactly the same is valid for an e-book. Furthermore, this would possibly be against the author's permission and due to this fact not legal. To ensure that an e-book cannot be edited, some especially suitable formats were introduced (Weber and Cavanaugh, 2006; Gibson and Gibb, 2011; Anton *et al.*, 2013).

*Flowability:* Another important property in order to qualify as an e-book is to be reflowable. This means that the text always adjusts perfectly to the screen you are reading on, no matter which size it has. The flowability includes the general format of the text, the line breaks and the chapters and also the size and position of images, all proportions have to be proper at every time (MacFadyen, 2011; Lee, 2012).

## 2.1 Previous studies

The empirical studies presented in the following paragraphs, evolve around the acceptance of e-books and are conducted in various different countries. The presentation of each study includes the research objectives, the main theories that were used by the researchers, the location and time period of the research, the numerous variables (factors) that were used, the methodology that was followed, as well as the main empirical results. More specifically, we reviewed studies that have similar characteristics with the present study. The results of these previous studies reveal different opinions about the acceptance of e-books.

Chu (2003) analytically researched the viewpoints of e-book readers. A questionnaire survey was distributed among 27 students at a library and information science school in the USA, to find out what users and potential users think about e-book in a transition period, when the US economy has experienced downtime, and the e-book world failed to see profitability, as predicted. Among the 27 survey participants, a third of them have used e-books in the past, mostly reading computer-based e-books, without special readers. Those who have never used e-books mainly think that e-books are "hard to read and browse" or "need special equipment". However, about half of the non-users of e-books plan to examine some e-book titles in the future.

Carreiro (2010) examined how new technologies are changing the face of the publishing industry. This paper explored the topic of electronic books (e-books) and the impact that these devices and other new technologies has on the publishing industry. Modern society often claims that the publishing industry is dying and that the innovation of the e-book will eventually sentence the printed book to death. But this study showed that such is not the case.

The empirical study of Richardson and Mahmood (2012) examined user satisfaction from e-books. Their study was based on a survey of 81 information studies graduate students, who responded about their ownership of specific e-readers, their likes and dislikes, as well as perceived problems. Additionally, respondents were asked to volunteer for an ethnographic journaling study, which allowed eight book readers to use one of the five available eBook readers for a weekend, or longer. The authors found that the Kindle is the most popular, but regardless of reader, the respondents disliked the poor navigation and inability to add titles in their collection. In addition, the respondents liked the portability of the readers, as well as the ability to have multiple books on one single reader. However, they also identified a major issue, notably, the licensing of titles versus outright ownership.

In 2012, Tsai studied the acceptance of e-books, using the variables: ease of use, perceived utility, brand / service confidence, attitude and actual intention to use. The questionnaire was based on the TAM and consisted of several modules. Four-item Likert scales were used. Initially, test questionnaires were distributed (80) and then, after a reliability analysis, the final questionnaires were also collected. Using random sampling techniques, emails were sent to book readers. 298 questionnaires were, finally, collected, while only 213 were valid.

The KMO and Bartlett's test, variance analysis and three different models were tested. The results showed that consumer attitudes are positively influenced by trust and usefulness, and there is no significant relationship between ease of use and attitude. Last but not least, the researchers believe that their study will motivate businesses into targeting existing consumers and improving their websites and security (Tsai, 2012).

Particularly interesting is the research of Camarero *et al.* (2013), as it approaches acceptance by introducing the concepts of morality, piracy and pricing, for which little research has been done in the past. Their research model drew data from the TAM, the theory of self-efficacy, and the general theory of marketing ethics, using a variety of factors (variables) from these theories. Finally, the factors were divided into three distinct categories: technological factors, reader characteristics and moral factors. The final questionnaire, distributed to a sample of 227 users of e-readers and tablets in Spain, contained questions that combined the Likert scale, the equilateral scale, and Nominated/ Mutually Excluded Questions. The results were analyzed using the SEM technique and revealed that there is a negative correlation between price acceptance and piracy, namely that the less money one is willing to spend, the more likely it is to turn to the illegal downloading.

Letchumanan and Muniandy (2013) investigated the impact of TAM's elements on user attitude towards e-books, but also examined the relationship between the factors of TAM. Quantitative research was conducted on 119 undergraduate students at the University of Malaysia. The questionnaire focused on the relationship between the following variables: perceived utility, ease of use, attitude, and intention to use. Initially, a pilot study was conducted, in order to avoid any ambiguity, and then the students completed the questionnaires. They returned 119 valid questionnaires, out of the 300 that were shared. A reliability analysis and a least square regression analysis were performed. The results showed that perceived utility has a positive effect on ease of use, ease of use and perceived utility have a positive effect on attitude and utility does not affect intention to use. The authors suggested that seminars should be held by e-books providers to familiarize non-users with e-books.

In order to fully understand the factors influencing the acceptance of e-books, Gerlach and Buxmann (2013) explored the factors that determine the acceptance of e-books at the individual level. Their research was based on the TAM and DIT models. "Perceived ease of use",

"perceived utility", "behavioral intention", "value", "previous experience", and "preferred mode of reading" were studied. The two authors conducted their research at several public locations in a central European city and provided the sample with an electronic reader, so they can get acquainted with the device. Then, they distributed 180 questionnaires with questions about the experience of the users. The data were tested for their validity with various measures (e.g., Cronbach Alpha, etc.). The most interesting conclusions were the confirmation of the positive relationship between the compatibility of the preferred mode of reading and the perceived usefulness and the rejection of the hypothesis that past technological experiences can push readers to prefer e-books. The contribution of this research lies in linking the acceptance of a cultural asset with the acceptance of a technology (Gerlach and Buxmann, 2013).

Another empirical survey conducted by the two same researchers (Gerlach and Buxmann, 2011), revealed that there is a close correlation between the tactile features of books as objects, but also as a means of an overall reading experience (weight, size, page break, etc.) and perceived dissatisfaction with the e-books. In particular, Gerlach and Buxmann (2011) examined "perceived dissatisfaction" as a variable of acceptance of e-books and divided conceptual constructions into two sub-categories: (a) tactile factors and (b) disagreement factors. They conducted a qualitative research at a German bookstore and conducted 30 open interviews. It was noticed that experienced book readers are most likely to feel uncomfortable using e-books, because of cognitive dissonance between old habits and new experiences, and therefore reject them. The researchers consider that the results of their research can be used to better understand resistance to innovation when touch-characteristics play an important role (Gerlach and Buxmann, 2011).

In 2014, Jin used an enriched TAM, together with DIT, TPB and TRA, for his own research on accepting e-books. The peculiarity of the proposed model lies in the separation of internal and external factors. Specifically, these variables were: compatibility, relative advantage, self-efficacy, subjective standards (external), perceived utility, perceived ease of use, e-book satisfaction and intent to continue using e-book (Jin, 2014).

The sample of the research consisted of undergraduate economics and management students of two South Korean universities. At the beginning of the semester, they had been distributed e-readers for their learning needs. Data collection was conducted at the end of the semester, using the questionnaire method. 1030 of these were collected and analytically tested for their reliability and validity. Subsequently, the case study was followed. The empirical results confirmed TAM's key role in e-book acceptance research, as well as that external variables (apart from the relative advantage) positively affect PEOU and PU. The findings, according to Jin (2014), will assist in enhancing and designing marketing strategies, by providing more complete products, as well as consolidating e-books on the market (Jin, 2014).

Park *et al.* (2015) reviewed reader's experiences during an e-book reading and the complications that they may have in accepting them. In particular, based on a highly complex model, they analysed the components of TAM and tested the relationship between the various TAM factors, while they also examined their relationship with other variables, such as the "locus of control" and "ease of reading the text". Initial qualitative and quantitative research was carried out in 219 university students, with an average age of 22,8 years. At the beginning, the participants were familiarised with reading devices and were asked questions about their past experiences on reading e-books. In the second part of the survey, questionnaires were distributed. In total, questionnaires consisted of 9 factors, measured on a 7-point Likert scale. The results verified the proposed model, and revealed that "portability" and "viewing experience" positively affect "ease of use". These empirical results are important, according to the researchers, for the development of marketing strategies and, in particular, for the promotion by e-book readers.

In conclusion, the results of these previous empirical studies reveal different opinions and findings about the acceptance of e-book. Therefore, since research consensus has not yet been reached, conducting a study that empirically examines e-book acceptance seems quite interesting.

## 3. The proposed conceptual framework

### 3.1 Development of the conceptual framework
The main objective of this paper is the development of a conceptual framework which investigates the factors that affect the acceptance of e-books by the readers and their behaviour towards them.

The extensive review of the contemporary international literature that was conducted prior to the empirical research, revealed that numerous factors have been used in order to predict the acceptance of e-books. The present study adopted nine of these factors.

### 3.2 Factor Definition
The factors used in the present study come from an extended literature review. Through the study of previous researches, a conceptual framework (research model) that consists of 9 factors was developed. These nine factors are (Ajzen and Fishbein, 1977; Ajzen, 1991; Camarero *et al.*, 2013; Davis, 1986; Davis, 1989; Fishbein and Ajzen, 1975; Gerlach and Buxmann, 2013; Mangin *et al.*, 2013; Tsai, 2012; Venkatesh and Davis, 2000):

Perceived Usefulness: The perceived usefulness is "the degree to which a person believes that using a particular electronic reading device will enhance the effectiveness of reading".

Perceived Ease of Use: The perceived ease of use is "the degree to which a person believes that using a new electronic reading technology is free from effort".

Trust: The perception of a user regarding the safety and validity of electronic transaction procedures.

Perceived Dissatisfaction: The frustration an individual may experience while using new technologies.

Compatibility with the Preferred way of reading: The degree to which the usage of new electronic reading technologies fits the personal preferences of a user.

Compatibility with past Experiences: The degree that indicates how familiar a user is with new e-reading technologies.

Price: The perception of an individual regarding the value of an electronic reading device compared to the fee

he has to pay for its purchase.

Attitude towards use: The positive or negative feelings or evaluations generated when an individual uses new information technologies.

Behavioural Intention: The degree of a person's willingness to use electronic reading technologies in the future.

### 3.3 Hypotheses

The objective of the Technology Acceptance Model (TAM), which was formulated by Davis (1986), is to explain and predict user acceptance of technology innovations or Information Systems (Montano and Kasprzyk, 2008; Masrom, 2007). According to Davis (1986), perceived usefulness (PU) and perceived ease of use (PEOU) are the two main predictors of technology acceptance. PU is the belief that the usage of a particular technological innovation can enhance the users' job efficiency and performance; whereas PEOU captures the belief that users make less effort in order to use that technological product. Besides these two constructs, TAM also consists of factors such as attitude towards use, intention to use (ITU), actual use and other related external variables (Davis, 1986; Venkatesh and Davis, 2000). Perceived usefulness is often positively affected by perceived ease of use. If a technology is easy to use, the user can spend more cognitive effort on the actual task, increasing his or her net gains (Gerlach and Buxmann, 2013). Even if a technology is perceived as useful, it will only be used if it is perceived as easy to use, that is, benefits of usage outweigh the effort of using the system (Bradley, 2009). The perceived usefulness is based on the observation that "people tend to use or not use the application to the extent they believe it will help them perform their job better" (Fishbein and Ajzen, 1975; Davis, 1989). Based upon previous research, the following hypotheses are proposed:

**H1:** *Perceived Ease of Use has a substantial positive impact on Perceived Usefulness.*

**H2:** *Perceived Ease of Use has a substantial positive impact on Attitude Towards Use.*

**H3:** *Perceived Usefulness has a substantial positive impact on Attitude Towards Use.*

Agarwal and Prasad (1999) found a positive relationship between an individual's prior compatible experiences and the acceptance of the new technology. If an individual is accustomed to reading from screens, he or she might be less sceptical toward reading e-books (Gerlach and Buxmann, 2013). In case a user feels frustration using an electronic reading device, it is less possible for him or her to adopt it as the preferred way of reading. A reader's desires regarding his or her preferred reading style are essential to the decision whether to use electronic reading technology or not. If a reader thinks that using e-book technology will fit his or her personal preferences, he or she will be more likely to adopt that technology (Gerlach and Buxmann, 2013). Thus, the

following hypotheses are being proposed:

**H4:** *Perceived Dissatisfaction has a substantial negative impact on Attitude Towards Use.*

**H5:** *Compatibility with the preferred way of reading has a substantial negative impact on Perceived Dissatisfaction.*

**H6:** *Compatibility with the preferred way of reading has a substantial positive impact on Attitude Towards Use.*

**H7:** *Compatibility with past Experiences has a substantial positive impact on Perceived Dissatisfaction.*

Based on the trust model suggested by Mayer *et al.* (1995), perceived trust is an essential component, especially when uncertainty is "present". Trust refers to the perception of the users regarding the overall safety of electronic transaction procedures. If an individual believes that transaction systems for e-books are safe, he or she will be more likely to adopt them. The basic assumption is that perceived trust will have a positive effect on an individual's intentions to engage in using e-books. In a consumer context, price is also an important factor, as consumers have to bear the financial costs associated with the purchase of devices and services. The price value is positive when the benefits of using a technology are perceived to be greater than the monetary cost. Such a price value has a positive impact on intention (Liao *et al.*, 2008; Venkatesh *et al.*, 2012; Mangin *et al.*, 2013). Thus, the following hypotheses are proposed:

**H8:** *Trust has a substantial positive impact on Attitude Towards Use.*

**H9:** *Price has a substantial positive impact on Perceived Usefulness.*

**H10:** *Price has a substantial positive impact on Behavioural Intention.*

Previous studies of the technology acceptance domain have discovered a relationship between the attitude towards using a system and the actual intention to use it (e.g., Davis, 1989; Ajzen and Fishbein, 1977; Ajzen, 1991). Davis (1989) hypothesized that the attitude of a user toward a system was a significant determinant of whether the user will actually use or reject the system. Thus, it is hypothesised:

**H11:** *Attitude Towards Use has a substantial positive impact on Behavioural Intention.*

The synthesis of the hypotheses presented above constitutes the proposed conceptual framework (research model) of the present empirical study (Figure 1). It should be underlined that, according to the best of the researcher's knowledge, such a conceptual framework (combination of research factors) has never been previously examined in the international literature.
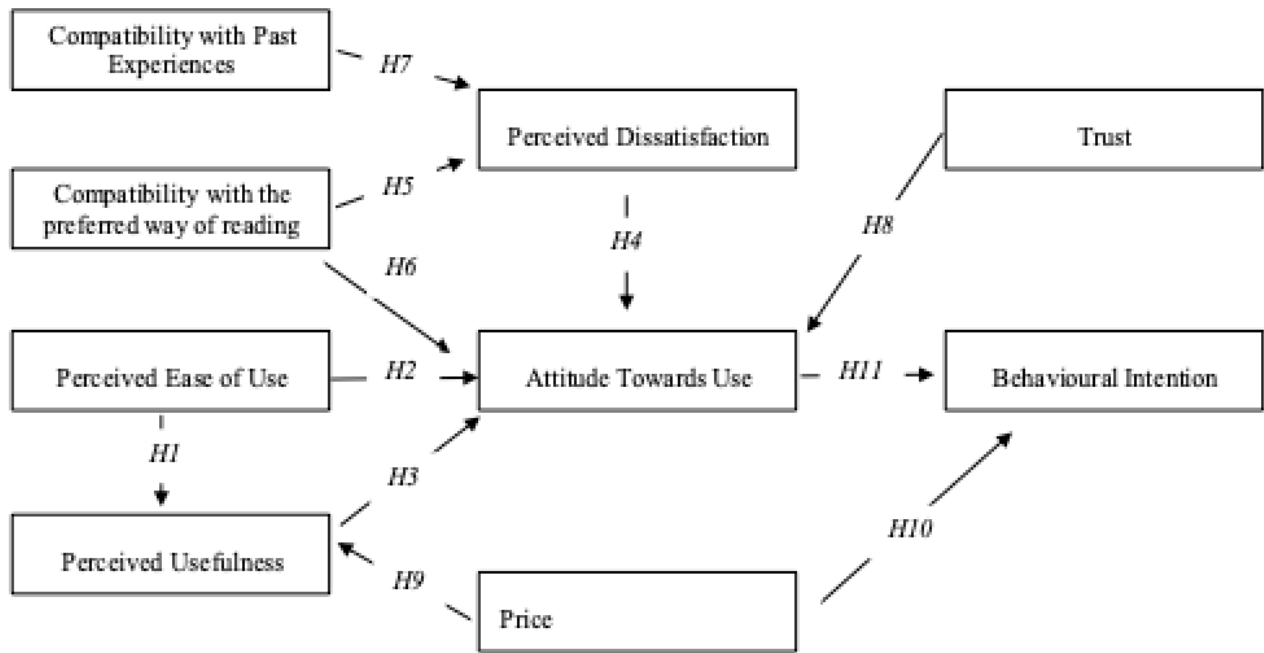
**Figure 1**. The proposed conceptual framework of the study

## 4. Methodology

### 4.1 Methodological approach

In order to sufficiently answer the main research questions of this study, a systematic review of the existing literature was conducted. As a result, the proposed conceptual framework of the study was developed. Then, the conceptual framework was tested (hypothesis testing) using primary data, collected from three different countries (Greece, Austria, France).

The present study is empirical (primary data collection), explanatory (examines cause-and-effect relationships between nine research factors), deductive (tests research hypotheses) and quantitative (analyses quantitative data collected with the use of a structured questionnaire).

### 4.2 Measurement

A newly developed questionnaire was used for the examination of the proposed framework. The questionnaire was based on items that have been used by various previous researchers. The five-point Likert scale was used for the measurement of all research factors (1 = strongly disagree, 5 = strongly agree).

The questions were translated to Greek, German and French. In total, the questionnaire measures 9 factors using 33 items. Besides the measurement of the factors, the questionnaire contained one more section, which included demographic information about the respondent. The questionnaire items were reviewed and (slightly) modified by two academics, who are considered as experts in this field.

The following Table (Table 1) demonstrates the nine (9) factors measured in the research, the items used for their measurement and the studies from which they were adapted.

**Table 1**. Factor measurement.

| Factors | Number of Items | Adapted from: |
|---|---|---|
| A. Perceived Usefulness | 5 | Gerlach and Buxmann (2013) |
| B. Perceived Ease of Use | 4 | Gerlach and Buxmann (2013) |
| C. Perceived Trust | 3 | Tsai (2012) |
| D. Perceived Dissatisfaction | 4 | Gerlach and Buxmann (2013) |
| E. Compatibility with the preferred way of reading | 3 | Gerlach and Buxmann (2013) |
| F. Compatibility with past experiences | 3 | Gerlach and Buxmann (2013) |
| G. Price | 4 | Mangin *et al.* (2013) |
| H. Attitude towards use | 3 | Tsai (2012) |
| I. Behavioral Intention | 4 | Gerlach and Buxmann (2013) |

**Table 2**. Validity and reliability.

| Factors | Kaiser-Mayer-Olkin | % of Variance | Cronbach Alpha | Normed $X^2$ | C.R. | V.E. | RMSEA | CFI / GFI |
|---|---|---|---|---|---|---|---|---|
| | Explanatory Factor Analysis | | | Confirmatory Factor Analysis | | | | |
| A. Perceived Usefulness | 0,814 | 73,451 | 0,845 | 2,19 | 0,79 | 64,4% | 0,045 | 0,97 / 0,91 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| B. Perceived Ease of Use | 0,790 | 65,544 | 0,844 | 2,51 | 0,79 | 75,3% | 0,064 | 0,97 / 0,91 |
| C. Perceived Trust | 0,811 | 66,411 | 0,842 | 3,11 | 0,86 | 78,2% | 0,066 | 0,97 / 0,91 |
| D. Perceived Dissatisfaction | 0,891 | 77,910 | 0,856 | 3,13 | 0,89 | 74,6% | 0,078 | 0,97 / 0,91 |
| E. Compatibility with the preferred way of reading | 0,791 | 73,271 | 0,762 | 3,45 | 0,81 | 77,8% | 0,072 | 0,97 / 0,91 |
| F. Compatibility with past experiences | 0,850 | 65,156 | 0,891 | 2,49 | 0,81 | 75,4% | 0,036 | 0,97 / 0,91 |
| G. Price | 0,845 | 71,850 | 0,756 | 3,77 | 0,79 | 71,3% | 0,055 | 0,97 / 0,91 |
| H. Attitude towards use | 0,781 | 69,780 | 0,775 | 3,41 | 0,84 | 66,2% | 0,074 | 0,97 / 0,91 |
| I. Behavioral Intention | 0,812 | 75,502 | 0,814 | 3,33 | 0,80 | 66,5% | 0,071 | 0,97 / 0,91 |

## 4.3 Sample and data collection

The population of this study consists of citizens of three European countries, namely France, Austria and Greece. Citizens who cannot read, people that are digitally illiterate and finally those who are not familiar with the subject of this research were excluded from the final sample. Therefore, the sample of this study consists of citizens who read books and are conversant with technology (Daniel, 2012).

The questionnaire was uploaded online, via Google Forms, and was promoted to French, Austrian and Greek book blogs and other social media platforms, that were randomly selected (Fielding *et al.*, 2017). This procedure took place over the course of 4 weeks (February 2019) and resulted in the collection of 120, 154 and 167 questionnaires from each country, respectively.

## 4.4 Validity and reliability

During the validity test, each of the nine factors was evaluated (a) for its unidimensionality and reliability, (b) for its goodness of fit to the proposed model (see Table 2).

(a) The examination of the unidimensionality was conducted with the use of Explanatory Factor Analysis. The following measures were examined (Fabrigar and Wegener, 2011): (a1) 'Bartlett's test of Sphericity', (a2) the statistical test of 'Kaiser-Mayer-Olkin' (KMO), (a3) the criterion of 'eigenvalue', (a4) the factor loadings, (a5) the statistical measure 'Cronbach Alpha' (for estimating the reliability of every factor).

(b) Moreover, the evaluation of the goodness of fit of all factors was conducted with the use of Confirmatory Factor Analysis. More specifically, the following measures were examined (Brown, 2014): (b1) Normed $X^2$, (b2) Composite Reliability (C.R.), (b3) Average Variance Extracted (A.V.E.), (b4) RMSEA (Root Mean Square Error of Approximation), (b5) CFI (Comparative Fit Index), (b6) GFI (Goodness of Fit Index).

All appropriate tests (presented in Table 2) concluded that the scales that were used for the measurement of all the research factors of this study are valid and reliable.

## 5. Empirical results

### 5.1 Demographics

The first section of the questionnaire contained questions asking the demographic characteristics of the individuals who participated in the research. The citizenship of those individuals was determined by the number of questionnaires collected by each participating team. In total, 441 questionnaires were collected, 27,2% of which were submitted by French citizens, while the rest were almost equally filled out by Austrian and Greek citizens (34,9% and 37,9% respectively) (Table 3). The age group that appears more often in the questionnaires is 18-25 (42%), while an adequate percentage comes from people who are over 56 years old (7,3%), as Table 4 demonstrates.

### 5.2 Mean scores

The mean score of seven (7) out of the 9 (nine) factors was over the value of 3,0 (on a five point Likert- scale). There are only two factors with a mean score below 3,0 ("compatibility with the preferred way of reading", "compatibility with past experiences"). This means that the sample tends to disagree on the items which measure these factors (Table 5) (the items are presented in the Appendix of this study).

### 5.3 Comparison of means

The comparison of means can lead to the establishment of relationships between the demographic data and the factors that affect the acceptance of electronic books by the readers. First, the analysis of variance (ANOVA) tested the relationship between the factors and the citizenship of the participants. Table 6 shows the factors with the biggest differences between the three countries.

**Table 3**. Participating countries.

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| France | 120 | 27,2% | 27,2% | 27,2% |
| Austria | 154 | 34,9% | 34,9% | 62,1% |
| Greece | 167 | 37,9% | 37,9% | 100,0% |
| Total | 441 | 100,0% | 100,0% | |

**Table 4**. Age groups.

|  | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 18-25 | 185 | 42,0 | 42,0 | 42,0 |
| 26-35 | 82 | 18,6 | 18,6 | 60,5 |
| 36-45 | 77 | 17,5 | 17,5 | 78,0 |
| 46-55 | 65 | 14,7 | 14,7 | 92,7 |
| 56+ | 32 | 7,3 | 7,3 | 100,0 |
| Total | 441 | 100,0 | 100,0 | |

**Table 5**. Mean scores − Factors.

|  | Mean | Std. Deviation |
|---|---|---|
| A. Perceived Usefulness | 3,2810 | 0,99984 |
| B. Perceived Ease of Use | 3,8107 | 0,94200 |
| C. Perceived Trust | 3,3873 | 0,87642 |
| D. Perceived Dissatisfaction | 3,4121 | 0,99868 |
| E. Compatibility with the preferred way of reading | 2,7831 | 1,07834 |
| F. Compatibility with past experiences | 2,9986 | 1,05112 |
| G. Price | 3,5298 | 0,79666 |
| H. Attitude towards use | 3,2300 | 1,04145 |
| I. Behavioral Intention | 3,1723 | 1,10990 |

**Table 6**. Comparison of means (Research factors).

|  |  | N | Mean | Std. Deviation | p |
|---|---|---|---|---|---|
| A. Perceived Usefulness | France | 120 | 3,0992 | 1,09746 | |
|  | Austria | 154 | 3,5000 | 0,99048 | 0,002 |
|  | Greece | 167 | 3,2096 | 0,89921 | |
|  | Total | 441 | 3,2810 | 0,99984 | |
| F. Compatibility with past experiences | France | 120 | 3,2803 | 1,11565 | |
|  | Austria | 154 | 2,6129 | 1,09178 | 0,000 |
|  | Greece | 167 | 3,1519 | 0,84768 | |
|  | Total | 441 | 2,9986 | 1,05112 | |
| H. Attitude towards use | France | 120 | 3,1735 | 1,12764 | |
|  | Austria | 154 | 3,4068 | 1,08708 | 0,028 |
|  | Greece | 167 | 3,1076 | 0,90981 | |
|  | Total | 441 | 3,2300 | 1,04145 | |
| I. Behavioural Intention | France | 120 | 3,0292 | 1,22953 | |
|  | Austria | 154 | 3,4416 | 1,17253 | 0,001 |
|  | Greece | 167 | 3,0269 | 0,90056 | |
|  | Total | 441 | 3,1723 | 1,10990 | |

**Table 7**. Comparison of means (Age groups).

|  |  | N | Mean | Std. Deviation | p |
|---|---|---|---|---|---|
| B. Perceived Ease of Use | 18-25 | 185 | 4,0581 | 0,81281 | |
|  | 26-35 | 82 | 4,0152 | 0,82901 | |
|  | 36-45 | 77 | 3,8669 | 0,71817 | 0,002 |
|  | 46-55 | 65 | 3,3500 | 0,88034 | |
|  | 56+ | 32 | 2,6563 | 1,30716 | |
|  | Total | 441 | 3,8107 | 0,94200 | |
| D. Perceived Dissatisfaction | 18-25 | 185 | 3,3608 | 0,95350 | |
|  | 26-35 | 82 | 3,2683 | 0,97956 | |
|  | 36-45 | 77 | 3,3571 | 1,03032 | 0,001 |
|  | 46-55 | 65 | 3,4654 | 0,91949 | |
|  | 56+ | 32 | 4,1016 | 1,15329 | |
|  | Total | 441 | 3,4121 | 0,99868 | |
| E. Compatibility with the preferred way of reading | 18-25 | 185 | 2,8741 | 0,99889 | |
|  | 26-35 | 82 | 3,0160 | 1,11729 | |
|  | 36-45 | 77 | 2,7836 | 1,14203 | 0,00 |
|  | 46-55 | 65 | 2,5948 | 0,90848 | |
|  | 56+ | 32 | 2,0409 | 1,25829 | |
|  | Total | 441 | 2,7831 | 1,07834 | |

| | | 18-25 | 185 | 3,6063 | 0,79077 | |
|---|---|---|---|---|---|---|
| G. Price | | 26-35 | 82 | 3,6829 | 0,82031 | 0,001 |
| | | 36-45 | 77 | 3,5649 | 0,68394 | |
| | | 46-55 | 65 | 3,2731 | 0,70118 | |
| | | 56+ | 32 | 3,1328 | 0,98780 | |
| | | Total | 441 | 3,5298 | 0,79666 | |

As seen above (Table 6), people from Austria tend to believe that e-books are useful, while they seem to be familiar with electronic reading devices, unlike the citizens of the other two countries. In addition, the Austrians are more likely to read e-books in the future.

The age group, in which a person belongs, has a substantial impact on Perceived Ease of Use. Young people think that reading e-books is easy. The older someone gets, the harder he finds the use of an electronic device. This attitude towards electronic books has to do partly with their perception regarding books in general. Having been used to paperback, older people feel awkward using an e-book.

Finally, all the age groups believe that the price of e-books is acceptable and the value of an e-book responds to the fee they have to pay.

### 5.4 Hypotheses testing

The examination of the proposed conceptual framework (test of eleven research hypotheses) was conducted using the Structural Equation Modelling technique (SEM). More specifically, the Maximum Likelihood Estimation method was employed. Also, the Covariance Matrix was used as the table of entry and the "Standardized Completely Solution" was requested (Hair *et al.*, 1995; Kelloway, 1998).

In more detail, the (modified) structural model fitted the data well, while the factors that were included can explain 69% of the variance of the main dependent factor "behavioural intention" and 72% of the dependent factor "attitude towards use". It must be stressed that new paths were added to the model, based on modification indexes of IBM AMOS 23. This resulted in a structural model with improved fit and explanatory (predictive) power.

More analytically, to evaluate the fit of the overall model the chi-square value ($X^2 = 81,012$ with 19 degrees of freedom) and the p-value (p = 0,000) were estimated. These values indicate a good fit of the data to the overall model. However, the sensitivity of the $X^2$ statistic to the sample size forces towards the adoption of other supplementary measures for evaluating the overall model (Harrison and Rainer, 1996), such as the "Normed-X2" index (4,26), the RSMEA index (0,086), the RMR index (0,054), the CFI (0,972), the GFI (0,960) and the NFI (0,963), that all indicate a very good fit.

Figure 2 demonstrates the final structural model (research model) (after all the necessary modifications), along with the path coefficients (r) and the adjusted $R^2$ scores. Table 8 shows the overall findings concerning the original hypotheses and the new proposed causal relationships.

In synopsis, results offer support to nine research hypotheses (H1, H3, H4, H5, H6, H7, H8, H9, H11), whilst two hypotheses are not verified by the empirical data (H2, H10). Moreover, eight new causal paths were added to the initially proposed conceptual framework.
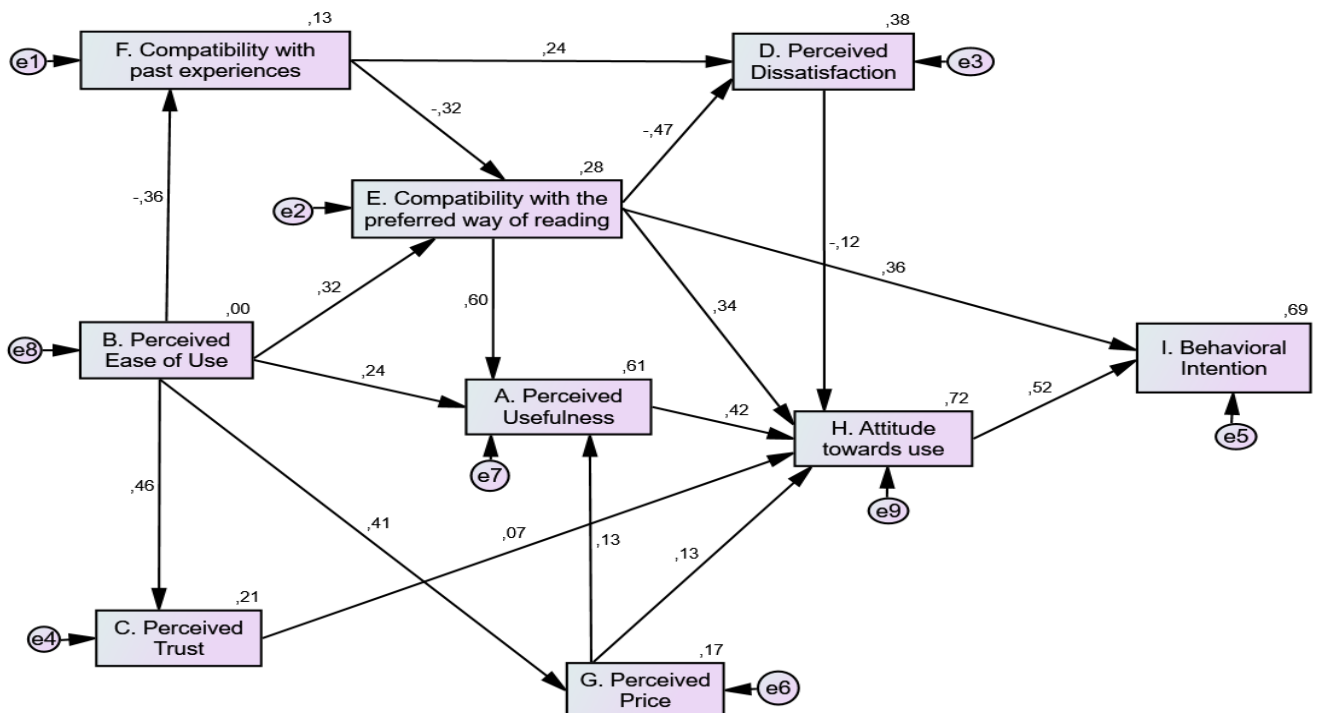


**Figure 2**. The (modified) conceptual framework *(all paths are statistically significant)*

**Table 8**. Hypotheses testing results.

| Hypothesis | Path | Path coefficient | Remarks |
|---|---|---|---|
| H1 | Perceived Ease of Use → Perceived Usefulness | 0,23* | Accepted |
| H2 | Perceived Ease of Use → Attitude Towards Use | - | *Rejected* |
| H3 | Perceived Usefulness → Attitude Towards Use | 0,42* | Accepted |
| H4 | Perceived Dissatisfaction → Attitude Towards Use | –0,11* | Accepted |
| H5 | Compatibility with the preferred way of reading → Perceived Dissatisfaction | –0,47* | Accepted |
| H6 | Compatibility with the preferred way of reading → Attitude Towards Use | 0,34* | Accepted |
| H7 | Compatibility with Past Experiences → Perceived Dissatisfaction | 0,24* | Accepted |
| H8 | Trust → Attitude Towards Use | 0,72* | Accepted |
| H9 | Price → Perceived Usefulness | 0,13* | Accepted |
| H10 | Price → Behavioural Intention | - | *Rejected* |
| H11 | Attitude Towards Use → Behavioral Intention | 0,52* | Accepted |
| | *Proposed causal relationships* | | |
| | Perceived Ease of Use → Compatibility with Past Experiences | –0,36* | *New path* |
| | Perceived Ease of Use → Compatibility with the preferred way of reading | 0,31* | *New path* |
| | Perceived Ease of Use → Price | 0,41* | *New path* |
| | Perceived Ease of Use → Trust | 0,46* | *New path* |
| | Compatibility with Past Experiences → Compatibility with the preferred way of reading | –0,32* | *New path* |
| | Compatibility with the preferred way of reading → Perceived Usefulness | 0,59* | *New path* |
| | Compatibility with the preferred way of reading → Behavioral Intention | 0,36* | *New path* |
| | Price → Attitude Towards Use | 0,13* | *New path* |

*\* p < 0,01*

In more detail, the two factors that have a significant impact to "behavioral intention", are "attitude towards use" (r=0,52) and the "compatibility with the preferred way of reading" (r=0,36). The factor "compatibility with the preferred way of reading", examines whether the reading style of readers matches with e-books, while the factor "attitude towards use" examines whether each reader has a positive or negative attitude towards the use of e-books. The factor "compatibility with the preferred way of reading" seems to be a particularly significant factor (r=0,36), because it directly affects "behavioral intention", while at the same time receiving a positive influence from the factor "perceived ease of use" (r=0,32) and a negative influence from the factor "compatibility with past experiences" (r=-0,32). Respectively, the influence of "attitude towards use" is equally important, because it greatly affects the main dependent factor of this study, namely "behavioral intention" (r=0,52). This is the case because "attitude towards use" receives significant influences from other five factors: "perceived dissatisfaction" (r=0,38), "compatibility with the preferred way of reading" (r=0,34), "perceived trust" (r=0,41), "perceived usefulness" (r=0,42), "perceived price" (r=0,17).

In the initial set of research hypotheses, the factors "ease of use" and "perceived price" were hypothesised to directly affect "behavioral intention". Nevertheless, the two corresponding hypotheses were rejected by the empirical data. Despite that, "ease of use" is highlighted as a significant factor of the conceptual framework, because it significantly affects five other factors: "compatibility with past experiences" (r=-0,36), "compatibility with the preferred way of reading" (r=0,32), "perceived price" (r=0,42), "perceived usefulness" (r=0,24) and "perceived trust" (r=0,46). On the other hand, such results were not found for the factor "perceived price". Although "perceived price" has an indirect impact on "behavioral intention" (through the factor "attitude towards use"), this impact is not considerable (it is quite week).

## 6. Conclusions

The present study was motivated by gaps that were recognised in the relevant literature of the field. In order to cover these research gaps, we conducted an extensive literature review and we developed an original conceptual framework (research model) that investigated the antecedents of e-book adoption. This conceptual framework has never been used before in the international literature. Additionally, this framework was tested with the use of a newly-developed structured questionnaire (collection of quantitative data) on a

sample of Greek, French and Austrian book readers. Future empirical studies can adopt the same methodological approach, further highlighting the relationship between critical factors for e-book adoption. E-books are a special, complex and extremely interesting field of research for academics, entrepreneurs, but also for every booklover in general. This empirical study tried to highlight the barely mapped world of e-books on a European level. While the acceptance models that were used in the past have yielded interesting results, this paper added some additional elements (factors), thus extending the current stream of research.

The main objective of the present study was to investigate the factors that affect the acceptance of e-books by the readers. In particular, the empirical data were collected from three countries, namely France, Austria and Greece. The results indicate that Austrian citizens are more familiar with electronic reading devices. In addition, they seem more positive towards the use of electronic books, compared to French and Greek readers. Thus, it is more likely that Austrians will read more e-books in the future. Regarding the acceptance of electronic books among the different age groups of the sample, it is observed that there is a remarkable (statistically significant) difference between younger and older people. Young people seem to believe that electronic books are easy to use, while older people encounter difficulties while using e-books. In summary, young people are positive towards using e-books. On the contrary, reading from electronic reading devices does not match with the way older people prefer reading books.

The examination of the conceptual framework (research model) of this study assisted in answering its main research question (which factors are important for the acceptance of e-books). Empirical results revealed that the factors that have the most significant impact on e-book acceptance, both directly and/or indirectly, are three: "compatibility with the preferred way of reading", "ease of use" and "attitude towards use".

Therefore, these findings can be used by publishing houses, e-reader manufacturers and software developers, in order to introduce products and adopt policies that will enhance their ability to better reach their target audiences. In more detail, the results of this study suggest that additional research should be conducted on how readers prefer to read (thus understanding the compatibility with their preferred way of reading). In that direction, companies should collect more primary data, using questionnaires in universities, libraries and other alternative research settings. In that way, they will be able to make e-books more "friendly" to their readers. Another proposal is to offer e-books in different file types. Although PDF is the most common e-book file type, companies should offer files in multiple different file types, so customers can choose the format they actually prefer (thus enhancing their ease of use). In order to make readers more familiar with the use of e-books, companies could also provide free e-books to schools, universities, libraries, etc. In that way, the opportunity will be given to young children and seniors to get in line with the digital era and experience e-books. Moreover, in order to enhance the reader's positive attitude towards e-books, publishing houses, e-reader manufacturers and software developers should design targeted marketing campaigns and advertisements for e-books, highlighting their ecological nature. In that way, more citizens will be able to fully understand that reading an e-book helps the preservation of nature. After all, the use of an electronic book is not just a technological achievement, but also a sign that an individual respects the environment. Another way a company can use in order to introduce e-books to the consumers is by conducting webinars. These can help people understand how to use e-books and what value they can offer them.

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## APPENDIX (QUESTIONNAIRE)

**Perceived Usefulness**
PU1. I believe that e-books can make reading more effective.
PU2. E-books match my personal needs.
PU3. Having books in e-books form is useful.
PU4. For my personal needs, I consider the potential that e-books are useful.
PU5. For my personal needs, I consider e-books practical.

**Perceived Ease of Use**
PEOU1. I think that e-books are easy to use.
PEOU2. Learning to use an e-book is easy for me.
PEOU3. I do not encounter difficulties while using e-books.
PEOU4. I think that reading e-books is easy.

**Perceived Trust**
PT1. I believe that electronic transaction procedures and their outcome are valid.
PT2. I believe that transaction systems for e-books are safe.
PT3. I believe that my personal data are safe during and after the transaction.

**Perceived Dissatisfaction**
PDIS1. Having been used to paperback, it feels awkward using an e-book.
PDIS2. Not having the feel of a paperback in my hands bothers me.
PDIS3. I believe that e-books are impersonal.
PDIS4. While holding the device, I cannot see the progress I have done so far.

**Compatibility with the preferred way of reading**
COMPREAD1. Reading e-books match with the way I like reading books.
COMPREAD2. E-books allow me to read in the way I want.
COMPREAD3. E-books match with my chosen way of reading.

**Compatibility with past experiences**
COMPEXP1. E-books are a new experience for me.
COMPEXP2. Reading e-books is a new reading experience for me.
COMPEXP3. Reading e-books is awkward for me.

**Perceived Price**
PR1. Buying paperback via bookstores is more expensive than buying e-books via internet.
PR2. Buying e-books allows me saving money.
PR3. Buying e-books is great value.
PR4. I think that the price of e-books is acceptable.

**Attitude towards use**
ATT1. I like using e-books.
ATT2. Using e-books is a good idea.
ATT3. I am positive towards using e-books.

**Behavioral Intention**
BEHINT1. I believe that I will read e-books in the future.
BEHINT2. I am planning to read e-books in the future.
BEHINT3. I would like to read e-books.
BEHINT4. I predict that I will read e-book in the future.