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The Effect of Presentation Types and Flow on E-Book Purchase Intention

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E-book has grown into a revolutionary way of publishing due to the rapid development of mobile technologies. The Association of American Publishers (AAP) revealed that E-book sales were down in 2014. Many designers consider E-book should be produced with dynamic format to increase purchase behavior. This study focuses on individual users' perceived characteristics of innovation and the flow of e-books with different presentation types as explanatory and predictive variables impacting the purchase behavior of users. The experiment was conducted using 200 student volunteers at a comprehensive university. There are significant differences in the perceived characteristics of innovation, flow and purchase intention for different presentation types of e-book readers. Flow is an important factor influencing the e-book purchase intention and carries the same weight in each group tested. For reading static e-book content on a tablet, users' perceived observability and flow have positive impacts on their purchase intention. Conversely, users' perceived complexity has a negative effect on their purchase intention. The research results suggest that designers and publishing companies produce static, not dynamic e-books for use on the tablet to increase E-book sales.

Keywords: e-book. perceived characteristics of innovation. flow theory. media richness theory. purchase intention

INTRODUCTION

E-book has grown into a revolutionary way of publishing due to the rapid development of mobile technologies. Amazon's introduction of the Kindle in 2007 established the first e-book reading device to win wide acceptance with the general public. This innovation has caused major shifts in the business of publishing, the distribution of books and the rights held by publishers and authors (Chatillon, 2013). Woody et al. (2010) indicated that students who had previously used an e-book still preferred print texts for learning. The survey from Voxburner reported that among 1,400 16-to-24-year-olds in the U.K. approximately 62% indicate they prefer print books over e-books. The Association of American Publishers (AAP) revealed that e-book sales were approximately $128 million in August 2014, down 3% from a year earlier (Martin, 2014). Why are users shifting from the e-book of mobile technology back to the paper and print of books? While the phenomenon is multi-layered, one aspect may be related to the effect of presentation types on purchase intention.

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Some of the prior research comparing e-book with print format has been concerned with learning effectiveness and performance. Rockinson et al. (2013) demonstrated that there was no difference in university students' grades and perceived learning scores between groups using traditional textbooks and those using e-textbooks. Ihmeideh (2014) indicated that children's emergent literacy skills in the e-books group showed significantly better performance than that of the children in the printed books group. Willoughby et al. (2015) investigated the differential effectiveness of paper alphabet books, alphabet e-books and storybook control in training alphabetic knowledge in 4-year-olds. Children in all conditions improved over time in emergent literacy but no significant differences between conditions were found. Daniel and Woody (2013) examined students' use and performance on a variety of print (print textbook, print text pages and print manuscript) and electronic formats (electronic pdf and electronic textbook) in both laboratory and at-home conditions. The results showed that students scored similarly across formats and conditions.

E-book can be considered an information technology (IT) innovation for many readers. According to Tornatzky and Fleischer's (1990) definition, innovation is "the situationally new development and introduction of knowledge-derived tools, artifacts, and devices by which people extend and interact with their environment" (p. 10). Rogers (1983) identified five attributes of innovation that are key to acceptance behavior. These include (a) relative advantage, (b) complexity, (c) compatibility, (d) trialability and (e) observability. Lee (2013) examined the factors that led to adoption of the mobile e-book in South Korea. The study indicated that perceived usefulness and ease of use influence intention to use. Innovation resistance has significant negative influence on the intention to use. However, few previous studies have investigated how users' perceived characteristics of innovation influence the use of e-books.

Based on the Innovation Diffusion Theory of Rogers (1983), this study focuses on individual users' perceived characteristics of innovation as explanatory and predictive variables for their use behavior of e-books. Two specific questions guide this research: First, can the flow variables be integrated into the model of perceived characteristics of innovation to accurately predict the intention of individuals to use e-books? Second, do the presentation types of e-books play an important role in the purchase behavior of potential e-books users?

State of the literature

- E-book has grown into a revolutionary way of publishing due to the rapid development of mobile technologies
- E-book can be considered an information technology (IT) innovation for many readers
- Some of the prior research comparing e-book with print format has been concerned with learning effectiveness and performance
- Amazon's introduction of the Kindle in 2007 established the first e-book reading device to win wide acceptance with the general public

Contribution of this paper to the literature

- The current research can lead to several further studies. First, the model tested here has been empirically assessed in only one conducting context.
- The generalizability of the results shown here is not known beyond the sample with work experience, other technology contexts and richness antecedents.
- A second concern is that the dependent construct here represents behavioral intention of initial adoption. It would be valuable to conduct studies to understand potential implications of experience gained over time for the technology use model

LITERATURE AND RESEARCH MODEL

The research in this study is founded on previous advances related to the theory of perceived characteristics of innovation and flow theory. A description of each of these theories follows, along with hypotheses related to the current research. This section culminates with a research model integrating the foundational research.

The Perceived Characteristics of Innovation

Rogers (1983, 1995) identified attributes of innovation that are key constructs to adoption behavior. These include (a) relative advantage, (b) complexity, (c) compatibility, (d) trialability and (e) observability. Relative advantage presents the degree to which a potential adopter views the innovation as offering an advantage over previous ways of performing the same task. The construct of complexity captures the degree to which a potential adopter considers use of the target system to be relative ly difficult. Compatibility indicates the degree to which an innovation is perceived as being consistent with the existing values, needs and past experiences of potential adopters. Trialability explains the perception of potential adopters of an opportunity to try the innovation before committing to its use. Observability explains the extent to which potential adopters see the innovation as being viable in the adoption context. Rogers addresses relative advantage, compatibility, trialability and observability as positive influences on innovation adoption, whereas complexity conducts a negative influence.

Huang and Hsieh (2012) randomly collected data from consumers in Taiwan who had begun to use e-book readers in the three months prior to their study. The research findings showed that consumers' perceived innovative attributes (compatibility and complexity) of the device directly affected their use of the e-book readers, whereas relative advantage did not directly influence the e-book usage. The research model did not include trialability and observability in the study. Sanni et al. (2013) drew upon the Diffusion of Innovation Theory to examine five attributes of e-journals as possible influences to the rate of e-journal publishing adoption. Their research findings showed that only complexity and trialability emerge as significant contributors to e-journal adoption rates. In another study, perceived relative advantage, ease of use, and compatibility significantly influence attitude, which in turn lead to behavioral intention to adopt (or continue to use) mobile banking (Lin, 2011). These studies confirmed the perceived characteristics of innovation identified by Rogers (1983, 1995). They explained technology adoption behavior in specific technology contexts, but the results of salient perception factors were inconsistent (Liao & Lu, 2008; Lin, 2011; Huang & Hsieh, 2012; & Sanni et al., 2013). Therefore, based on the original study by Rogers (1983), the following hypotheses were tested:

H1: The perceived characteristics of innovation of e-book have a positive impact on users' purchase intention.

H1a: The perceptions of relative advantage have a positive impact on users' purchase intention.

H1b: The perceptions of compatibility have a positive impact on users' purchase intention.

H1c: The perceptions of complexity have a positive impact on users' purchase intention.

H1d: The perceptions of trialability have a positive impact on users' purchase intention.

H1e: The perceptions of observability have a positive impact on users' purchase intention.

Flow Theory

The user's flow level might also contribute to use intention of e-book. Mihalyi Csikszentmihalyi proposed flow theory to indicate that when people are in flow, they "shift into a common mode of experience" as they become absorbed in their activity (Csikszentmihalyi & Csikszentmihalyi, 1988). Flow experience is defined by nine dimensions: (1) clear goals; (2) immediate feedback; (3) matched challenge and skills; (4) the merging of actions and awareness; (5) concentration on the task; (6) a

sense of potential control; (7) the loss of self-consciousness; (8) altered sense of time; and (9) the autotelic experience (Csikszentmihalyi, 1993). When individuals are in flow, they become immersed in the activity, losing awareness of time and irrelevant perceptions; and their thoughts are filtered.

The impact of flow on a variety of online activities has been studied. Okazaki and Mendez (2013) developed, refined and validated an instrument to measure perceived ubiquity in mobile services. Perceived ubiquity strongly and directly influence flow. In addition, flow leads to positive influence on the continuous usage of mobile service. Chang (2013) proposed that the flow experience is representative of a high level of customer satisfaction and influences continuous usage of social network games. Chang and Zhu (2012) tested the role of social capital and flow experience in driving users to continue using social networking sites based on the expectation-confirmation theory of information system. Flow experience impacts users' satisfaction but their not continuance intention. The relationship of flow and use intention were inconsistent in different technology contexts (Chang, 2013; Chang & Zhu, 2012; Okazaki & Mendez, 2013). Hence, the following hypothesis was tested:

H2: Flow level of e-book reading is positively related to user's purchase intention.

Media Richness Theory

The Media Richness Theory proposed by Daft and Lengel is defined as the ''capacity to process rich information" (1986). Media classifications range from rich (face-to-face) to lean (numeric documents). Based on the work of Schmitz and Fulk (1991), there are four attributes to classify for media richness: (1) the ability to handle multiple cues simultaneously; (2) the ability to facilitate rapid feedback; (3) the ability to establish personal focus; and (4) language variety. Some previous research found positive effects of rich media on consumers' behavior in online news (Sundar, 2000), communication media (Palvia et al., 2011) and commercial websites and products (Coyle & Thorson, 2001; Fernandez et al., 2013; Lua et al., 2014; Saat & Selamat, 2014; & Simon & Peppas, 2004). Lua et al. (2014) developed four websites that utilized media richness and interactivity to promote physical activity among college students. Media richness had a significant primary effect on college students' intention to visit the fitness center.

Few studies have addressed the user perception and purchase behavior of e-books from the media richness viewpoint. In one study, students in Turkey were found to be effectively using tablet PCs to perform tasks such as document reading and note-taking in Turkish (Şimşek, and Doğru, 2014). Liu et al. (2009) indicated that the text-audio-video presentation type had the highest level of perceived usefulness in the surveys. The results of the final survey indicate that subjects using the audio-video presentation type perceived the technology as less useful than subjects using the text-audio presentation type. In addition, the presentation type with the highest media richness (the text-audio-video presentation type) was found to have the highest level of concentration, whereas the presentation type with the lowest media richness (the text-audio presentation type) was found to have the lowest level of concentration. Therefore, the following hypotheses were tested:

H3: E-book presentation types are positively related to user's perceived characteristics of innovation, flow and purchase intention of e-book.

H3a: E-book presentation types are positively related to user's perceptions of relative advantage.

H3b: E-book presentation types are positively related to user's perceptions of compatibility.

H3c: E-book presentation types are positively related to user's perceptions of complexity.

H3d: E-book presentation types are positively related to user's perceptions of trialability.

H3e: E-book presentation types are positively related to user's perceptions of observability.

H3f: E-book presentation types are positively related to user's flow level.

H3g: E-book presentation types are positively related to user's purchase intention.

The Research Model

The proposed research model drawn from the constructs of perceived characteristics of innovation, flow, and purchase intention and presentation types is shown in Figure 1. The research model is empirically tested in this study. Perceived characteristics of innovation are composed of five user perceptions: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability and (e) observability. It is proposed in the model that flow is a potential determinant of e-book purchase intention and, as such, it is the independent variable for this study. The definitions of the variables are provided in Table 1.

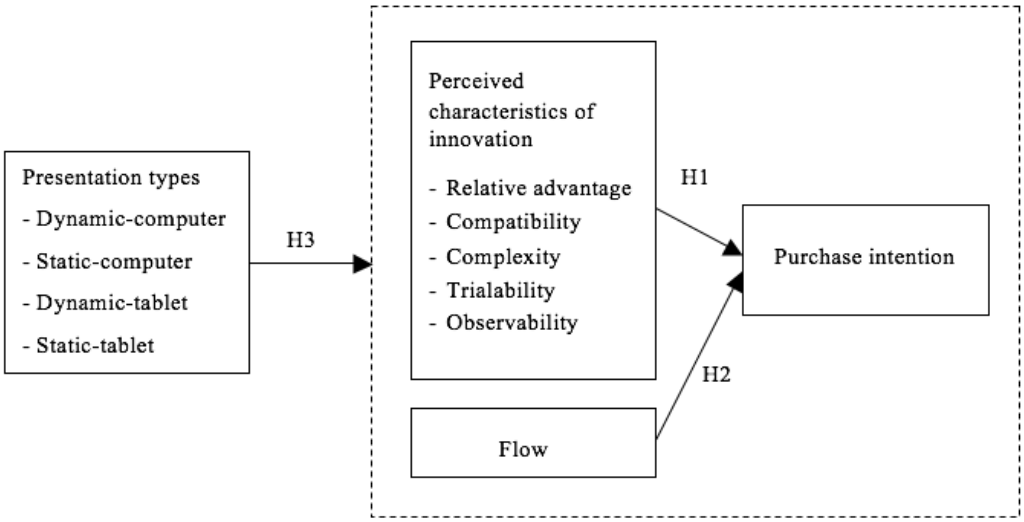

Figure 1. The research model

Table 1. Research variables and definitions

Research variables	Definition	Reference
Relative advantage	Degree to which an e-book is considered superior to its predecessor	Rogers (1995)
Compatibility	Degree to which an e-book is considered compatible with existing values, beliefs, experiences and needs of users	Rogers (1995)
Complexity	Degree to which an e-book is considered by a user as relatively difficult to use and understand	Rogers (1995)
Trialability	Based on users' perceptions of the degree to which an innovation can be used on a trial basis before confirmation of the adoption must occur	Rogers (1995)
Observability	Degree to which potential adopters see an e-book as being visible in the adoption context	Rogers (1995)
Flow	Degree to which users maintain exclusive, focused attention on their activity	Csikszentmihalyi (1978)
Purchase intention	Degree to which users intend to purchase the e-book or increase their use of it in the future	Davis (1993)
Presentation types	E-book presentations types are divided into four types: (1) Dynamic-computer: e-book with animation format played on the computer (2) Static-computer: e-book with text and pictures format played on the computer (3) Dynamic-tablet: e-book with animation format played on the tablet (4) Static-tablet: e-book with text and pictures format played on the tablet	The study

RESEARCH METHODOLOGY

This study used the 2*2 laboratory experiment approach to empirically test the research hypotheses. This section describes the participants, instrument development, procedures and measures.

Research Participants

To test the research model, the experiment was conducted with student volunteers studying at a comprehensive university in Taiwan. A total of 200 surveys were completed. All subjects ranged in age from 19-24 years old. The sample population was comprised of 84 female (42%) and 116 male (58%) students.

Study Context and Procedures

Four presentation types of e-book about tourism were developed in the study, including dynamic-computer, static-computer, dynamic-tablet and static-tablet presentations. The tourism content maintained consistency across the types of presentation. The dynamic e-book with text, pictures and animation was designed using the Adobe Flash software. The static e-book was designed using the Adobe PDF format. The student volunteers were assigned to one of the four groups using random sampling in the study. Subjects in each group were provided access to read one e-book. Only the presentation types of the e-books differed among the groups. Group 1 received a dynamic-computer presentation e-book; Group 2 received a static-computer presentation e-book; Group 3 received a dynamic-tablet presentation e-book; and Group 4 received a static-tablet presentation e-book. After completing the 5-minute reading, the subjects were asked to complete a survey indicating their perceptions and purchase intention.

Instrument Development

The survey questionnaire included a combination of items derived from earlier studies as well as newly revised items to fit the study context. Rogers' (1995) questionnaire of scales of perceived characteristics of innovation was used as the foundation for the development of the survey instrument. It included a total of 24 items with each scale consisting of a minimum of two items. Flow was measured with a 6-item scale adapted from Ghani and Deshpande (1994) and Koufaris (2002). The users' purchase intention of the e-book were assessed using six items constructed according to the recommendations of Davis et al. (1989) and Xiao et al. (2009). Respondents scored on a 7-point Likert-type scale with the end points being ''strongly disagree" and ''strongly agree", except for items intended to collect demographic data.

Measures

The constructs of reliability and validity of the instrument were evaluated. Factor reliabilities as represented by Cronbach's α in Table 2 were between 0.745 and 0.914 for each factor. Reliability from the sample showed a reasonable level of reliability ($\alpha > 0.70$) (Cronbach, 1970). Factor analysis was also measured to confirm adequately the construct validity of the scales. Construct validity was

Table 2. Scale reliabilities and factor loadings for measures of constructs

Scale	RA	CPA	CPL	TR	OB	FL	PI
Cronbach's α = 0.768							
RA1	0.732						
RA2	0.655						
RA3	0.691						
RA4	0.698						
RA5	0.615						
RA6	0.713						
Cronbach's α = 0.745							
CPA1		0.620					
CPA2		0.499					
CPA3		0.813					
CPA4		0.701					
CPA5		0.839					
Cronbach's α = 0.807							
CPL1			0.724				
CPL2			0.864				
CPL3			0.869				
CPL4			0.746				
Cronbach's α = 0.857							
TR1				0.848			
TR2				0.910			
TR3				0.773			
TR4				0.849			
Cronbach's α = 0.851							
OB1					0.752		
OB2					0.754		
OB3					0.846		
OB4					0.814		
OB5					0.813		
Cronbach's α = 0.905							
FL1						0.737	
FL2						0.739	
FL3						0.910	
FL4						0.914	
FL5						0.797	
FL6						0.835	
Cronbach's α = 0.914							
PI1							0.921
PI2							0.908
PI3							0.716
PI4							0.866
PI5							0.832
PI6							0.775

Note. RA = relative advantage, CPA = compatibility, CPL = complexity, TR = trialability, OB = observability, FL = flow, PI = purchase intention

examined using the principal components method with varimax rotation. The factor loadings for all items exceeded 0.6 after deleting CPA2 item and indicated that the individual items also had discriminant validity. The factor loadings and explained variance for each of the constructs are displayed in Table 2.

RESULTS AND DISCUSSION

This study used Pearson correlation coefficients for all research. Variables are shown in Table 3.

Table 3. Pearson correlation coefficients

Research variables	RA	CPA	CPL	TR	OB	FL	PI
Relative advantage	1						
Compatibility	0.692**	1					
Complexity	0.657**	0.656**	1				
Trialability	0.656**	0.579**	0.547**	1			
Observability	0.601**	0.624**	0.681**	0.480**	1		
Flow	0.513**	0.569**	0.516**	0.358**	0.673**	1	
Purchase intention	0.628**	0.694**	0.636**	0.511**	0.729**	0.727**	1

$*p < 0.05$, $**p < 0.01$

Correlation coefficients were analyzed to avoid the high linearity that is inherent among independent variables. All variables were found to be significantly correlated with each other.

The Effect of E-book Presentation Types

Data associated with relative advantage, compatibility, complexity, trialability, observability, flow and purchase intention were analyzed using a repeated-measures, one-way-ANOVA test with the independent variable. The result of the independent sample F-test on the dependent constructs together with the respective means and the standard deviations for the four groups are summarized in Table 4.

The four groups had some significant differences in relative advantage ($F = 7.472$, $p < 0.01$); compatibility ($F = 4.766$, $p < 0.01$); complexity ($F = 9.971$, $p < 0.01$); trialability ($F = 4.813$, $p < 0.01$); observability ($F = 7.929$, $p < 0.01$); flow ($F = 20.786$, $p < 0.01$); and purchase intention ($F = 10.372$, $p < 0.01$). The results support hypotheses H3a through H3g.

The “Dynamic-Tablet” group and the “Dynamic-Computer” group ($p < 0.01$) as well as the “Dynamic-Tablet” group and the “Static-Computer” group ($p < 0.01$) had some significant differences in relative advantage in Table 5. The relative advantage perception of the “Dynamic-Tablet” group ($M = 5.5033$) was higher than the relative advantage perception of the “Dynamic-Computer” group ($M = 4.8166$) and the “Static-Computer” group ($M = 4.9933$). The “Static-Tablet” group and the “Dynamic-Computer” group ($p < 0.01$) as well as the “Static-Tablet” group and the “Static-Computer” group ($p < 0.05$) had some significant differences in relative advantage. The relative advantage perception of the “Static-Tablet” group ($M = 5.1816$) was higher than that of the “Dynamic-Computer” group ($M = 4.8166$) and the “Static-Computer” group ($M = 4.9933$). The “Dynamic-Tablet” group and the “Static-Tablet” group ($p > 0.1$) had no significant differences in relative advantage perception.

The “Dynamic-Tablet” group and the “Dynamic-Computer” group ($p < 0.01$) as well as the “Dynamic-Tablet” and “Static-Computer” groups ($p < 0.05$) had some significant differences in compatibility perception in Table 6. The compatibility perception of the “Dynamic-Tablet” group ($M = 5.175$) was higher than that of the “Dynamic-Computer” group ($M = 4.575$) and the “Static-Computer” group ($M = 4.810$). The “Static-Tablet” and “Dynamic-Computer” groups ($p < 0.01$) as well as the “Static-Tablet” and “Static -Computer” groups ($p < 0.05$) had some significant differences in compatibility perception. The compatibility perception of the “Static-Tablet” group ($M = 5.295$) was higher than that of the “Dynamic-Computer” ($M = 4.575$) and “Static-Computer” groups ($M = 4.810$). The “Dynamic-Tablet” and “Static-Tablet” groups ($p > 0.1$) had no significant differences in compatibility perception.

Table 4. The impact of e-book presentation types

Group	Number	Means	Standard deviation	*F*	*p*-value
Relative advantage					
Dynamic-Computer	50	4.817	0.885	7.472	0.000***
Static-Computer	50	4.993	0.831		
Dynamic-Tablet	50	5.503	0.898		
Static-Tablet	50	5.413	0.973		
Compatibility					
Dynamic-Computer	50	4.575	1.165	4.766	0.003**
Static-Computer	50	4.810	0.998		
Dynamic-Tablet	50	5.175	1.108		
Static-Tablet	50	5.295	1.011		
Complexity					
Dynamic-Computer	50	4.220	1.187	9.971	0.000***
Static-Computer	50	4.725	0.981		
Dynamic-Tablet	50	5.065	1.090		
Static-Tablet	50	5.325	1.004		
Trialability					
Dynamic-Computer	50	5.170	1.188	4.813	0.003**
Static-Computer	50	5.525	0.901		
Dynamic-Tablet	50	5.835	1.031		
Static-Tablet	50	5.850	0.991		
Observability					
Dynamic-Computer	50	3.960	1.076	7.929	0.000***
Static-Computer	50	4.372	1.017		
Dynamic-Tablet	50	4.708	1.037		
Static-Tablet	50	4.928	1.107		
Flow					
Dynamic-Computer	50	3.183	1.199	20.786	0.000***
Static-Computer	50	3.917	1.149		
Dynamic-Tablet	50	4.629	0.935		
Static-Tablet	50	4.580	0.889		
Purchase intention					
Dynamic-Computer	50	3.700	1.355	10.372	0.000***
Static-Computer	50	4.197	1.102		
Dynamic-Tablet	50	4.720	1.004		
Static-Tablet	50	4.850	1.135		

**p < 0.1, **p < 0.05, ***p < 0.01*

Table 5. The post-hoc tests of relative advantage

Construct	Group	Dynamic-Computer	Static-Computer	Dynamic-Tablet	Static-Tablet
Relative advantage	Dynamic-Computer	---			
	Static-Computer	0.301	---		
	Dynamic-Tablet	0.000***	0.003***	---	
	Static-Tablet	0.001***	0.015**	0.598	---

**p < 0.1, **p < 0.05, ***p < 0.01*

Table 6. The post-hoc tests of compatibility

Construct	Group	Dynamic-Computer	Static-Computer	Dynamic-Tablet	Static-Tablet
Compatibility	Dynamic-Computer	---			
	Static-Computer	0.275	----		
	Dynamic-Tablet	0.006***	0.091**	---	
	Static-Tablet	0.001***	0.025**	0.577	---

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$*

The "Static-Computer" and "Dynamic-Computer" groups ($p < 0.05$) had some significant differences in complexity perception in Table 7. The ease-of-use perception of the "Static-Computer" group (M = 4.725) was higher than that of the "Dynamic-Computer" group (M = 4.220). The "Dynamic-Tablet" and "Dynamic-Computer" groups ($p < 0.01$) had some significant differences in complexity perception. The ease of use perception of the "Dynamic-Tablet" group (M = 5.065) was higher than the "Dynamic-Computer" group (M = 4.220). The "Static-Tablet" group and the "Dynamic-Computer" group ($p < 0.01$) as well as the "Static-Tablet" group "Static-Computer" groups ($p < 0.01$) had some significant differences in complexity perception. The ease-of-use perception of the "Static-Tablet" group (M = 5.325) was higher than that of the "Dynamic-Computer" group (M = 4.220) and the "Static-Computer" group (M = 4.725). The "Dynamic-Tablet" and "Static-Tablet" groups ($p > 0.1$) had no significant differences in complexity perception.

The "Static-Computer" and "Dynamic-Computer" groups ($p < 0.1$) had some significant differences in trialability perception in Table 8. The trialability perception of the "Static-Computer" group (M = 5.525) was higher than the "Dynamic-Computer" group (M = 5.170). The "Dynamic-Tablet" and "Dynamic-Computer" groups ($p < 0.05$) had some significant differences in trialability perception. The trialability perception of the "Dynamic-Tablet" group (M = 5.835) was higher than the trialability perception of the "Dynamic-Computer" group (M = 5.170). The "Static-Tablet" and "Dynamic-Computer" groups ($p < 0.01$) had some significant differences in trialability perception. The trialability perception of the "Static-Tablet" group (M = 5.850) were higher than that of the "Dynamic-Computer" group (M = 5.170).

Table 7. The post-hoc tests of complexity

Construct	Group	Dynamic-Computer	Static-Computer	Dynamic-Tablet	Static-Tablet
Complexity	Dynamic-Computer	---			
	Static-Computer	0.019**	---		
	Dynamic-Tablet	0.000***	0.113	---	
	Static-Tablet	0.000***	0.006***	0.225	---

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$*

Table 8. The post-hoc tests of trialability

Construct	Group	Dynamic-Computer	Static-Computer	Dynamic-Tablet	Static-Tablet
Trialability	Dynamic-Computer	---			
	Static-Computer	0.087*	---		
	Dynamic-Tablet	0.002***	0.135	---	
	Static-Tablet	0.001***	0.117	0.942	---

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$*

Table 9. The post-hoc tests of observability

Construct	Group	Dynamic-Computer	Static-Computer	Dynamic-Tablet	Static-Tablet
Observability	Dynamic-Computer	---			
	Static-Computer	0.053*	---		
	Dynamic-Tablet	0.001***	0.114	---	
	Static-Tablet	0.000***	0.009***	0.301	---

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

Table 10. The post-hoc tests of flow

Construct	Group	Dynamic-Computer	Static-Computer	Dynamic-Tablet	Static-Tablet
Flow	Dynamic-Computer	---			
	Static-Computer	0.001***	---		
	Dynamic-Tablet	0.000***	0.001***	---	
	Static-Tablet	0.000***	0.002***	0.825	---

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

The "Static-Computer" group and the "Dynamic-Computer" group ($p < 0.05$) had some significant differences in purchase intention in Table 11. The purchase intention of the "Static-Computer" group (M = 4.197) was higher than that of the "Dynamic-Computer" group (M = 3.700). The "Dynamic-Tablet" and "Dynamic-Computer" groups ($p < 0.01$) as well as the "Dynamic-Tablet" and "Static-Computer" groups ($p < 0.05$) had some significant differences in purchase intention. The purchase intention of the "Dynamic-Tablet" group (M = 4.720) was higher than that of the "Dynamic-Computer" (M = 3.700) and "Static-Computer" groups (M = 4.197). The "Static-Tablet" group and the "Dynamic-Computer" group ($p < 0.01$) as well as the "Static-Tablet" and "Static-Computer" groups ($p < 0.01$) had some significant differences in purchase intention. The purchase intention of the "Static-Tablet" group (M = 4.850) was higher than that of the "Dynamic-Computer" (M = 3.700) and "Static-Computer" groups (M = 4.197). The "Dynamic-Tablet" and "Static-Tablet" groups ($p > 0.1$) had no significant differences in purchase intention.

The "Static-Computer" and "Dynamic-Computer" groups ($p < 0.1$) had some significant differences in observability perception in Table 9. The observability perception of the "Static-Computer" group (M = 4.372) was higher than the "Dynamic-Computer" group (M = 3.960). The "Dynamic-Tablet" and "Dynamic-Computer" groups ($p < 0.01$) had some significant differences in observability perception. The observability perception of the "Dynamic-Tablet" group (M = 4.708) were higher than the "Dynamic-Computer" group (M = 3.960). The "Static-Tablet" and "Dynamic-Computer" groups ($p < 0.01$) as well as the "Static-Tablet" and "Static-Computer" groups ($p < 0.01$) had some significant differences in observability perception. The observability perception of the "Static-Tablet" group (M = 4.928) were higher than that of the "Dynamic-Computer" (M = 3.960) and "Static-Computer" groups (M = 4.372). The "Dynamic-Tablet" and "Static-Tablet" groups ($p > 0.1$) had no significant differences in observability perception.

The "Static-Computer" group and the "Dynamic-Computer" group ($p < 0.01$) had some significant differences in flow in Table 10. The flow of the "Static-Computer" group (M = 3.917) was higher than that of the "Dynamic-Computer" group (M = 3.183). The "Dynamic-Tablet" and "Dynamic-Computer" groups ($p < 0.01$) as well as the "Dynamic-Tablet" and "Static-Computer" groups ($p < 0.01$) had some significant differences in flow. The flow of the "Dynamic-Tablet" group (M = 4.627) was higher

Table 11. The post-hoc tests of purchase intention

Construct	Group	Dynamic-Computer	Static-Computer	Dynamic-Tablet	Static-Tablet
Purchase intention	Dynamic-Computer	---			
	Static-Computer	0.033**	---		
	Dynamic-Tablet	0.000***	0.025**	---	
	Static-Tablet	0.000***	0.005***	0.575	---

*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$*

than the flow of the "Dynamic-Computer" (M = 3.183) and "Static-Computer" groups (M = 3.917). The "Static-Tablet" and "Dynamic-Computer" groups ($p < 0.01$) as well as the "Static-Tablet" and "Static -Computer" groups ($p < 0.01$) had some significant differences in flow. The flow of the "Static-Tablet" group (M = 4.580) were higher than that of the "Dynamic-Computer" (M = 3.183) and "Static-Computer" groups (M = 3.917). The "Dynamic-Tablet" and "Static-Tablet" groups ($p > 0.1$) had no significant differences in flow.

The Effect on Purchase Intention

The next step in the analysis was to test the significance of the four groups' adoption in the model. The residuals were also analyzed to verify the assumptions underlying the regression analysis. For those tests corresponding to H1-H2, the null hypotheses were tested. The t statistic and significance level of the research model are illustrated in Figure 2, as is whether the hypothesis was supported ($\alpha < 0.05$).

The results for the "Dynamic-Computer" group indicate that the perceptions of compatibility ($\beta = 0.368$, $\alpha < 0.01$), observability ($\beta = 0.275$, $\alpha < 0.05$) and flow ($\beta = 0.350$, $\alpha < 0.01$) have significant influence in e-book purchase intention. These three variables account for 79.0% of the variance in purchase intention. Perceived compatibility has the strongest impact on purchase intention, followed by flow and observability.

For the "Static-Computer" group, the study shows that relative advantage ($\beta = 0.459$, $\alpha < 0.01$) and flow ($\beta = 0.405$, $\alpha < 0.01$) directly affect e-book purchase intention. These two variables explain 53.4% of the variance in purchase intention. Relative advantage is a better predictor of purchase intention than is flow.

The results for the "Dynamic-Tablet" group reveal that compatibility ($\beta = 0.363$, $\alpha < 0.01$) and flow ($\beta = 0.401$, $\alpha < 0.01$) have positive effects on e-book purchase intention. These two variables explain 51.3% of the variation in purchase intention. Perceived compatibility is a stronger prediction of purchase intention than flow.

For the "Static-Tablet" group, the research points that complexity ($\beta = 0.241$, $\alpha < 0.01$), observability ($\beta = 0.470$, $\alpha < 0.01$) and flow ($\beta = 0.436$, $\alpha < 0.01$) have significant impact on e-book purchase intention. These three variables account for 75.6% of the variance in purchase intention. Perceived complexity is a negative predicator and perceived compatibility has the strongest impact on purchase intention, followed by flow and complexity.

The four research models with significant paths and Beta coefficients are provided in Figure 2. The study reveals that when users preview different presentation types of e-books, there are significant differences in the effects of perceived characteristics of innovation of e-books on the users' purchase intention. The hypotheses about users' perceived characteristics of innovation (H1) are partly supported and flow (H2) thus supported.

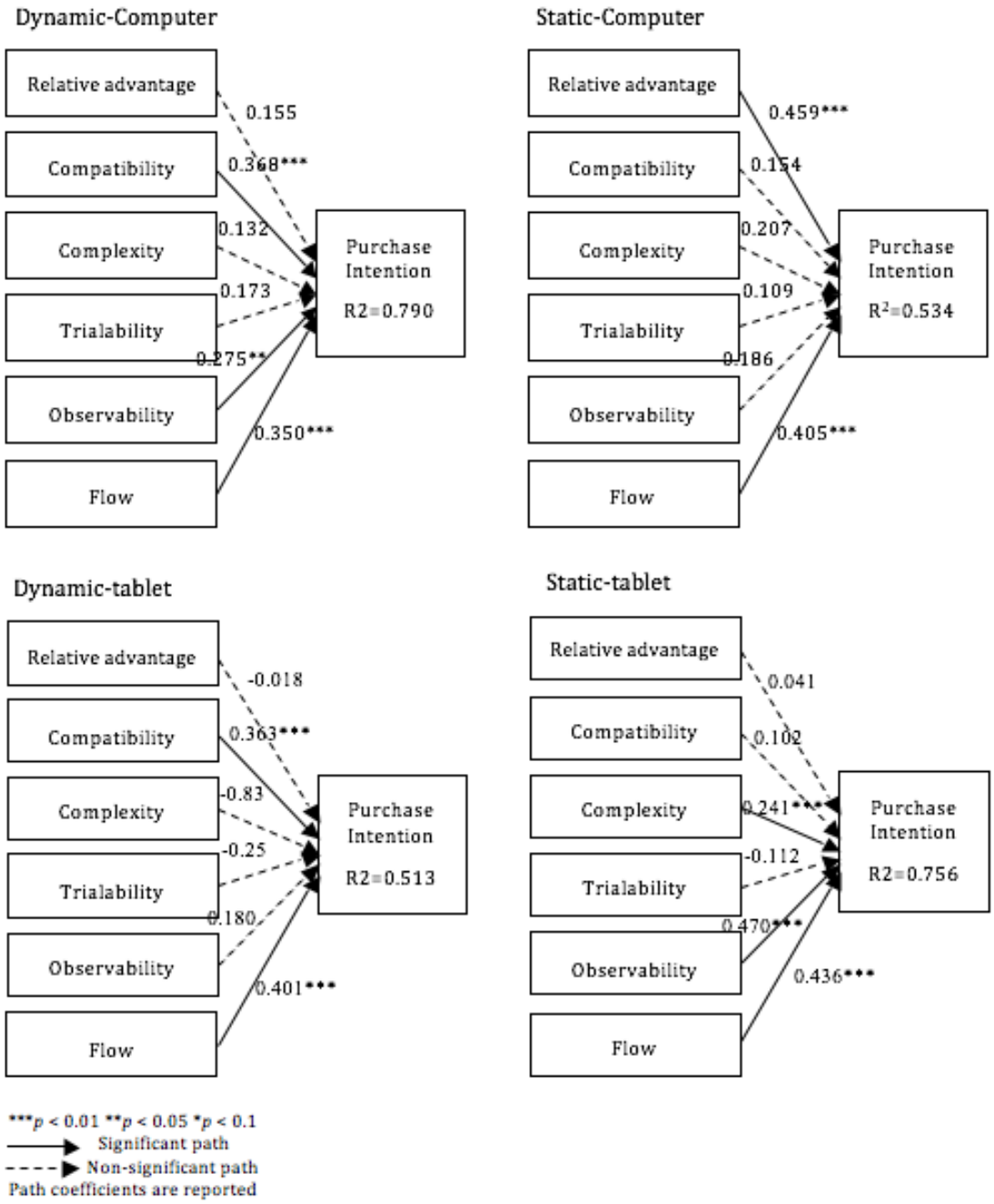

Figure 2. E-book use model for four groups users

CONCLUSION

This study aims to examine how the presentation types of e-books play an important role in the purchase behavior of the e-books' users. There are significant differences in the perceived characteristics of innovation, flow and purchase intention for different presentation types of e-book readers. When people use a tablet to read a static e-book, they have the highest level of compatibility, trialability, observability perception and purchase intention as well as the lowest level of complexity perception. They think using a tablet to read static e-books meets their reading habits and demands. Since these users can easily read static e-book content using the tablet, they increase the e-books purchase intention. People can visualize using a tablet in their workplace to read e-book content easily. Users have a high purchase intention to buy static e-books played on the tablet.

When people use tablets to read dynamic e-books, they will have the highest level of relative advantage and flow. When people use tablets to read dynamic e-books, they think the pairing can boost learning effectiveness to the highest level. When people use tablets to read dynamic e-books, they will concentrate on the reading and forget other things. However, when people use tablets to read either static or dynamic e-books, the experience revealed no significant difference in the perceived characteristics of innovation, flow and e-books purchase intention. People using tablets to read e-books have a higher level of perceived characteristics of innovation, flow and purchase intention than when using a computer in the study. Less time and cost is spent developing static e-books. Therefore, the research results suggest that the designers and publishing companies produce static e-book content to use on the tablet.

The results of the study also indicate a relationship between user perceived characteristics of innovation of the four e-book presentation types and their intention to purchase the e-book. In each group, flow carries the same influence on the e-book purchase intention. When users experience more concentration while reading e-books, they will have a higher purchase intention. No matter whether people read a dynamic e-book using a tablet or a computer, the designers have to increase users' compatibility perception. As dynamic e-books provide users with what they need to fulfill their reading habits, the users will have a higher purchase intention of the dynamic e-book. When designers develop static e-books for use on the tablet, they have to focus on the e-book advantage, universality and ease of use. Users' perceived observability has a positive impact on their purchase intention. Users' perceived complexity has a negative effect on their purchase intention.

The current research can lead to several further studies. First, the model tested here has been empirically assessed in only one conducting context. The generalizability of the results shown here is not known beyond the sample with work experience, other technology contexts and richness antecedents. A second concern is that the dependent construct here represents behavioral intention of initial adoption. It would be valuable to conduct studies to understand potential implications of experience gained over time for the technology use model. However, the proposed research model provides explanations and predictions to understand e-readers' behavior. Based on the research results, e-book designers and publishing companies can understand how to improve the e-book purchase intention.

REFERENCES

Chang, C. C., (2013). Examining users' intention to continue using social network games: A flow experience perspective. *Telematics and Informatics, 30(4)*, 311-321.

Chang, Y. O., & Zhu, D. H. (2012). The role of perceived social capital and flow experience in building users' continuance intention to social networking sites in China. *Computers in Human Behavior, 28(3)*, 995-1001.

Chatillon, D. (2013). Digital comes to the book industry - ebooks in 2013. *The Computer & Internet Lawye*r, 30(7), 6.

Coyle, J. R., & Thorson, E. (2001). The effects of progressive levels of interactivity and vividness in web marketing sites. *Journal of Advertising, 30(3)*, 65-77.

Cronbach, L. J. (1970). *Essentials of psychological testing*. New York: Harper and Row.

Csıkszentmihályi, M. (1978). *Beyond boredom and anxiety: Experiencing flow in work and play*. 2nd ED San Francisco: Jossey Bass.

Csikszentmihályi, M. (1993). *The evolving self: A psychology for the third millennium*. New York: Harper & Row.

Csikszentmihályi, M., & Csikszentmihályi, I. S. (1988). *Optimal experience: Psychological studies of flow in consciousness*. Cambridge, UK: Cambridge University Press.

Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Scienc*e, 32(5), 554-571.

Daniel, D. B., & Woody, W. D. (2013). E-textbooks at what cost? Performance and use of electronic v. print texts. *Computers & Education, 62*, 18-23.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35(8)*, 982-1003.

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies, 38(3)*, 475-487.

Fernandez, V., Simo, P., Sallan, J. M., & Enache, M. (2013). Evolution of online discussion forum richness according to channel expansion theory: A longitudinal panel data analysis. *Computers & Education, 62,* 32-40.

Ghani, J. A., & Deshpande, S. P. (1994). Task characteristics and the experience of optimal flow in human-computer interaction. *The Journal of Psychology, 128(4)*, 381-391.

Huang, L. Y., & Hsieh, Y. J. (2012). Consumer electronics acceptance based on innovation attributes and switching costs: The case of e-book readers. *Electronic Commerce Research and Applications, 11,* 218-228.

Ihmeideh, F. M. (2014). The effect of electronic books on enhancing emergent literacy skills of pre-school children. *Computers & Education, 79*, 40-48.

Koufaris, M. (2002). Applying the technology acceptance model and flow theory to online consumer behaviour. *Information Systems Research, 13(2)*, 205-223.

Lee, S. J. (2013). An integrated adoption model for e-books in a mobile environment: Evidence from South Korea. *Telematics and Informatics, 30(2)*, 165-176.

Lin, H. F. (2011). An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. *International Journal of Information Management, 31(3)*, 252-260.

Liao, H. L., & Lu, H. P. (2008). The role of experience and innovation characteristics in the adoption and continued use of e-learning websites. *Computers & Education, 51*, 1405-1416.

Liu, S. H., Liao, H. L., & Pratt, J. A. (2009). Impact of media richness and flow on e-learning technology acceptance. *Computers & Education, 52*, 599-607.

Lua, Y., Kimb, Y., Douc, X., & Kumard, S. (2014). Promote physical activity among college students: Using media richness and interactivity in web design. *Computers in Human Behavior, 41*, 40-50.

Martin, E. J. (2014). Ebook sales slow, strategies shift. *EContent, 37(2)*, 6-10.

Okazaki, S., & Mendez, F. (2013). Perceived ubiquity in mobile services. *Journal of Interactive marketing, 27(2)*, 98-111.

Palvia, P., Pinjani, P., Cannoy, S., & Jacks, T. (2011). Contextual constraints in media choice: Beyond information richness. *Decision Support Systems, 51(3)*, 657-670.

Rockinson-Szapkiw, A. J., Courduff, J., Carter, K., & Bennett, D. (2013). Electronic versus traditional print textbooks: A comparison study on the influence of university students' learning. *Computers & Education, 63,* 259-266.

Rogers, E. M. (1983). *Diffusion of innovations*. New York: The Free Press.

Rogers, E. M. (1995). Diffusion of innovation. New York: Free Press

Saat, R. M., & Selamat, M. H. (2014). An examination of consumer's attitude towards corporate social responsibility (CSR) web communication using media richness theory. *Procedia - Social and Behavioral Sciences, 155*, 392-397.

Sanni, S. A., Ngah, Z. A., Karim, N. H. A., Abdullah, N., & Waheed, M. (2013). Using the diffusion of innovation concept to explain the factors that contribute to the adoption rate of e-journal publishing. *Serials Review, 39(4)*, 250-257.

Schmitz, J., & Fulk, J. (1991). Organizational colleagues, media richness, and electronic mail: A test of the social influence model of technology use. *Communication Research, 18(4)*, 487-523.

Simon, S. J., & Peppas, S. C. (2004). An examination of media richness theory in product web site design: An empirical study. *Info, 6(4)*, 270-281.

Şimşek, M., & Doğru, I. A. (2014). Tablet PC based classroom. *Procedia - Social and Behavioral Sciences. 116(21)*, 4246-4249.

Sundar, S. S. (2000). Multimedia effects on processing and perception of online news: A study of picture, audio, and video downloads. *Journalism & Mass Communication Quarterly. 77(3)*, 480-499.

Tornatzky, L., & Fleischer, M. (1990). *The processes of technological innovation*. New York: Lexington Books.

Willoughby, D., Evans, M. E., & Nowak, S. (2015). Do ABC eBooks boost engagement and learning in preschoolers? An experimental study comparing eBooks with paper ABC and storybook controls. *Computers & Education, 82*, 107-117.

Woody, W. D., Daniel, D. B., & Baker, C. A. (2010). E-books or textbooks: Students prefer textbooks. *Computers & Education, 55*, 945-948.

Xiao, Z. H., Chang, S. C., Tsai, C. F., (2009). Factors influencing e-book acceptance. *Electronic Commerce Studies, 7(3)*, 355-384.

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Appendix, items and scales

Relative advantage

1. Using e-books makes reading more convenient.
2. Using e-books provides easy storage of reading material.
3. Using e-books frees up space needed to keep printed books.
4. Using e-books saves time by downloading content directly.
5. Using e-books improves learning effectiveness.
6. Getting e-books would be easy.

Compatibility

1. Using the computer has become an indispensible part of my life.
2. I already use the Internet to search for any information I want.
3. Using an e-book would fit well with my reading habits.
4. The network speed I have is fast enough to read on the Internet or download e-books.
5. Using an e-book is compatible with all aspects of my reading needs.

Complexity (Ease of use)

1. I know where I can download e-books.
2. Downloading e-books is very convenient.
3. The e-book interface is clear and easy to understand.
4. Using e-books is easy for me.

Trialability

1. Reading part of the content of an e-book before I purchase it would increase my intention to buy the e-book.
2. Testing the functions of an e-book before I purchase it would increase my intention to buy the e-book.
3. Having the opportunity to read the full content of an e-book before I purchase it would increase my intention to buy the e-book.
4. Having adequate opportunities to try out different types of e-books before I purchase one would increase my intention to buy an e-book.

Observability

1. I can easily discuss my opinions about e-books with others.
2. I have often seen e-books used at my workplace and in other places I go daily.
3. I usually learn about the release of new e-books and their improvements from the media and advertisements.
4. I usually learn about the release of new e-books and their improvements from my friends and relatives.
5. The advantages of e-books are readily apparent.

Flow

1. When I read e-books, I feel content.
2. When I read e-books, I feel the time passes fast.
3. When I read e-books, I concentrate on the content and forget my surroundings.
4. When I read e-books, I concentrate on the content and forget other things.

5. When I read e-books, I feel other things are not important.
6. When I read e-books, I concentrate deeply.

Purchase intention

1. It is highly likely that I will purchase e-books.
2. I highly intend to purchase e-books.
3. I would download and read free e-books.
4. I will possibly purchase e-books in the future to access knowledge so I can learn more.
5. It is highly likely I will recommend the purchase of e-books to my friends.
6. I would definitely spend money to purchase e-books.