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Investigating the Effect of Gamification on Website Features in E-Banking Sector: An Empirical Research

Hanan Yosry Emam [a,*] · Gamal Sayed Abdel Aziz [a]

[a] Faculty of Commerce, Cairo University, Giza, Egypt
[*] *Corresponding author*: hananyosrysayed@foc.cu.edu.eg

Abstract

In practice, gamification is seen as an effective marketing method to enhance customer experience and engagement in different activities. The influence of gamification on website features is vague in the case of e-banking. Therefore, this research aims to develop a theoretical framework that focuses on investigating the impact of gamification on website features that include ease-of-use, webpage characteristics, website information, and website design in the context of e-banking in Washington DC, United States of America. The research gathers data from 400 bank customers who interacted with a gamified e-banking website to monitor their financial transactions via an online questionnaire. The results show that gamification has a - significant influence on the ease of use, webpage characteristics, website information, and website design in the e-banking context.

Introduction

Gamification is considered as an interdisciplinary method aimed at inspiring users to obtain particular behavior or psychological results. It is critical to ensure that the growth of e-banking by game mechanics encourages and promotes website usage, avoids inaccuracy of information, and stimulates the use of e-banking, hence it is important to follow e-banking with game elements to solve the problem of inadequate or uncommon use of the website (Rodrigues et al., 2017). Therefore, banks started to develop an innovative strategy to increase website usage through using game features called gamification where companies start to use gamification to educate, motivate, engage, and influence employees and/or customers in many various contexts (Rodrigues et al., 2016a). Gamification in e-banking plays an important role in driving valuable customer behaviors, simplifying and enjoying complex processes, stimulating involvement with new products, and creating customer loyalty so that banks get more customer cash. In addition, gamification has the function of shifting the attitudes of customers towards money by making financial transactions more enjoyable and easing the awareness of financial literacy (Rodrigues et al., 2016a). The technology acceptance model (TAM) of Davis (1989) is chosen as a theoretical basis since it is the model that is most widely used to describe users' adoption of technology. In addition, Davis (1989) stated that TAM is a general theory of human behavior that is important in understanding the behavior of users in the use of game technology, as well as in general online customer behavior. Gamification has been discovered to be the most persuasive or compelling technology to manipulate user behavior, through game-design elements by triggering individual motivations (Petkov et al., 2011). Nevertheless, very few research studies track the growth of gamification in e-banking (Rodrigues et al., 2013; Rodrigues et al., 2014; Rodrigues et al., 2016a, and Rodrigues et al., 2017). Therefore, according to TAM and reviewing previous research, the present study seeks to bridge the gap by developing a conceptual framework that focuses on investigating the effect of the direct - association between gamification (as the independent variable) and website features (ease-of-use, webpage characteristics, website information, and website design) as the dependent variable in the context of e-banking in Washington DC, United States of America.

Literatures Review

This section includes two parts, the first part shows the research variables definitions of the study, then the second part reviews a number of studies that investigate the effect of gamification on website features.

Research Variables

The Dependent Variable

Website Features are the dependent variables in the present study in which website features are composed of ease-of-use, webpage characteristics, website information as well as website design.

Website Ease-of-Use: is defined as "the extent to which bank customers' adoption of gamified bank websites is perceived as easy or effortless" (Wakefield et al., 2011).

Webpage Characteristics: is defined as "documents are commonly written in Hypertext Markup Language (HTML) that are accessible through the Internet or another network, using a browser" (Rodrigues et al., 2017). Additionally, a webpage is typically featured by manuscript, graphs, and hyperlinks to another webpage.

Website Information: According to Walker (2011), website information can be defined as "the contents on the website, including text, pictures, avatars, graphics, layout, sound, and motion, to help customers in making good decisions".

Website Design: According to Tan et al. (2009), website design is defined as "the process of conceptualizing, planning and creating a collection of electronic files that determine the layout, colors, text styles, structure, graphics, images, and use of interactive features of the webpages".

The Independent Variable

Gamification: is defined in the present study as "a number of web design principles, processes, information, and games characteristics, to engage and motivate banks' customers to use the websites" (Rodrigues et al., 2017).

Then, the following part reviews a number of studies that investigate the association between gamification and website features as following:

Rodrigues et al. (2013) investigate the acceptance of a gamified business application in e-banking based on TAM. Furthermore, the study examines the association among perceived socialness, perceived ease-of-use, perceived usefulness, perceived enjoyment, and the intention to use a gamified application for e-banking mutual funds. The results from an online survey of 183 customers show that the gamified application has a positive impact on the acceptance of this new concept in e-banking. Furthermore, the results reveal that perceived ease-of-use have a significant positive impact on the intentions and perceived usefulness of customers. Additionally, perceived value and enjoyment have a positive effect on the perceived ease-of-use. The study recommends that banks shall develop business applications with game features in their websites, not just to improve customer loyalty, but also to attract current and prospective customers to purchase complicated goods in a new and an easy way.

Moreover, the objective of Rodrigues et al. (2014) is to define the elements and features of web design affecting the acceptance of the use of game features on banking websites. Through an online survey of 219 e-banking customers, the study investigates the impact of gamification on website ease-of-use, website information, web page features, website design, and the intention to use e-banking with game elements. The findings – conclude that gamification has a positive effect on all variables; in particular,

it has a medium-positive impact on web design information and a strong positive impact on customer intentions to use.

Rodrigues et al. (2016a) answer the research questions about how ease-of-use and enjoyment can influence bank customers to use e-banking with gamified software. The study conducts two quantitative studies on customers using gamified business applications in an e-banking context based on the Technology Acceptance Model. Research (A) in 2012 (N = 183), which analyzes the expectations of bank customers using a gamified application to buy and sell mutual funds. And research (B) in 2015 (N = 219), which examines the perceptions of bank customers after using warrant purchase and sale applications, via an online questionnaire. In addition, online bank customers are invited to rate the value of sociality, ease-of-use, usability, enjoyment, and purpose variables related to the use of e-banking systems with game features and social signals. The results conclude that ease-of-use and enjoyment have a positive impact on each other, but the effect of ease-of-use on enjoyment is greater than the opposite, and both have an impact on the use of e-banking. These results will directly contribute to the clarification of hedonic business software adoption in e-banking.

Additionally, Rodrigues et al. (2016b) concentrate- on the importance of online bank customers' adoption of social signals and gamification features because social characteristics or sociality can be added to e-banking to boost the experience of customers by, for example, uploading photos, avatars, online product reviews, referral agents, instant help-avatar, social networks, investment strategy sharing blogs., On the other hand, many advantages can be given by adding game design elements to e-business applications. First, because games have reward mechanisms, these rewards may trigger customers to use the website more frequently and can increase their financial operation (e.g., request financial information and conduct more transactions). Second, games will enhance the experience, learning process, and enjoyment of customers, promoting electronic channel adoption. Gamification and sociality can be used from a business viewpoint to decrease the face-to-face relationship and to maintain the production of electronic transactions directly carried out by customers. The study thus examines the causal relationship between gamification, socialness, ease-of-use, usefulness, enjoyment, intention to use, and business impact in gamified e-banking based on the TAM to better understand the acceptance of gamified applications. Using a sample of 183 bank customers, the study provides evidence that gamification dramatically enhance the sense of social interaction of the user, which in turn, strongly influence the intention of the customer to use the apps and ultimately impact -business. As a consequence, gamification is a very successful technique to be used by banks to inspire customers to increase their use of the website, thus increasing their financial activity.

Hsu et al. (2017) examine the causal relationships between website functionality (i.e., utilitarian and hedonic features), customer experience, perceived value (i.e. data value, experience value, social value, and transaction value), customer attitude, and behavioral intentions (i.e. intention to use and word-of-mouth intention) and the mediating effects of customer experience and attitude in the context of the gamified

website of recycling and environmental friendliness. In particular, the research sets out a structural equation model to analyze the causal relationships and the results show that both utilitarian and hedonic website features have a major effect on the experience of customers, which in turn affect their understanding of value and attitude. Hence, affecting their behavioral intentions. Importantly, the analysis confirms the mediating effects of customer experience and attitude on the associations.

Rodrigues et al. (2017) explore the impact of gamification on website features and the intention of customers to use them in e-banking. Website features such as ease-of-use, web page characteristics, data, and web design are determined by this analysis. The study designs a quantitative study involving 219 bank customers as respondents who replied to an online questionnaire to assess their responses to a gamified e-banking website to monitor their financial assets and their plans to use the website. The results indicate that gamification has a major impact on the ease-of-use, features of the webpage, information, and web design, as well as the intention to use e-banking.

Hsu and Chen (2018a) explore the antecedents and consequences of customer experience and its mediating role in a gamified website context of resource recycling via a recycling bank website. In particular, this research employs structural equation modeling to assess the causal relationships between variables by analyzing the impact on the customer experience of both perceived mobility and website features (i.e., utilitarian features and hedonic features), which in turn affect perceived benefits (i.e., self-benefits and social benefits), forms of perceived value (i.e. knowledge value, experience value (i.e. perceived quality, brand loyalty, brand associations, and brand trust). The findings show that customer experience is affected by both perceived mobility and utilitarian and hedonic website features, which in turn affect perceived benefits, perceived value styles, and brand equity, as well as the mediating impact of customer experience. In addition, in practice, the implementation of gamification is seen as an effective marketing tool to improve customer experience and involvement in different activities.

As shown above in this section, there is a conflict between researchers about website features. Some researchers divide website features into hedonic and utilitarian features. While other researchers classify website features into ease-of-use, webpage characteristics, website information, and web design. The current study will focus on website features in relation to ease-of-use, webpage characteristics, website information, and web design in e-banking websites.

Research Problem

According to reviewing the literature related to the relationship between gamification and website features. There is a gap in examining the relationship between gamification and website features. Despite the growing attention given to gamification in various contexts such as the bookstore, retail store, tourism, education, and crowdsourcing (Hsu and Chen, 2018b; Poncin et al., 2017; Xu et al., 2017; Huang et al., 2018; Aparicio et al., 2019; Feng et L., 2018), little empirical research (Rodrigues

et al., 2013, 2014, 2016b, 2017) theorize and empirically test the effect of gamification in the context of e-banking. The current study focuses on investigating the effect of gamification (as the independent variable) and website features as a dependent variable that includes ease-of-use, webpage characteristics, website information, and website design in the context of e-banking in Washington DC, United States of America.

Conceptual Model and Hypotheses

Grounded on Technology Acceptance Model (TAM) and literature review, the present study suggests a conceptual model and hypotheses to clarifying the influence of gamification (as the independent variable) on website features that include ease-of-use, webpage characteristics, website information, and website design (as dependent variable) in the context of e-banking in Washington DC, United States of America as seen in figure (1) below.
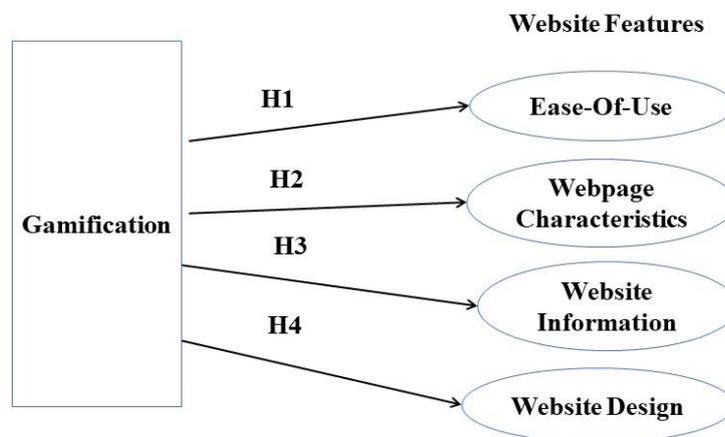
Figure (1) Proposed Conceptual Model

According to the literature review and TAM theory, the present study tests the following hypotheses:

H1: The gamification developed on the website positively influences perceived ease-of-use.

H2: Gamification has a positive effect on the webpage characteristics of the website.

H3: Gamification developed on a website positively influences website information.

H4: Gamification positively influences the website design.

Research Methodology

The target population will be all customers who have a bank account in a gamified e-banking system in Washington DC, United States of America. The study will use a non-probability convenient sample because there is not a sampling frame. To test the hypotheses presented in the proposed conceptual model, the study will collect data from 384 participants through an online questionnaire. The current study uses SPSS verion.26 to measure the reliability and the validity of constructs. Additionally, the study tests hypotheses by using Partial Least Square Structural Equation Modeling through Smart PLS version 3.3.2.

Measurements of Research Variables

Table (1) below lists the measurement items for each variable and reference sources of these items as well as the coefficient of reliability of research variables. All measurement scales follow the five-point Likert type scale which ranges among strongly disagree (1), neutral (3), and strongly agree (5) and adapted from earlier literature.

Table (1) Variables and Measurements

Constructs	Measurement Items	Cronbach's Alpha of items	Sources of measures
Gamification	1- Financial literacy on a bank website. 2-Pleasure. 3-participation. 4-security. 5-rewarding.	0.84	Deterding et al. (2011); Walker (2011).
Ease-of-Use	1- Search tool of bank website. 2- Well categorizing website. 3- Quick process. 4- Website interface. 5- Website mental effort.	0.80	Davis (1989); Wakefield et al. (2011)
Webpage Characteristic	1-Text style. 2- Attractiveness of graphics. 3- Digital animations. 4- Light colors.	0.71	Walker (2011).
Website Information	1- Information security. 2-Intensive information. 3- Complexity of information. 4-Existing avatars or digital animations. 5- Categorization of website information. 6-The quality of information.	0.80	Walker (2011)
Website Design	1- Attractiveness of bank website. 2-nice design. 3- Navigation bar and links. 4- Interactive design of bank website.	0.84	Wakefield et al. (2011).

Data Analysis and Results

The researcher applied descriptive statistics to determine the characteristics of the sample, the research variables descriptive analysis, measurement of reliability and validity by using SPSS software version 22. In addition, the research conducts inferential statistics including confirmatory factor analysis, discriminant validity, convergent validity, composite reliability, and testing research hypotheses using partial least square structural equation modeling approach (PLS-SEM) via smart PLS software (Version 3.3.2) to interpret the correlation relationships.

Descriptive Analysis of Study Variables

Descriptive analysis aims to describe the research variables by using mean and standard deviation for describing the effect of gamification as an independent variable on website features as a dependent variable. As shown in table (2) below, the respondents have the tendency to agree with the scale items for gamification (mean=3.94; SD= 0.51) as an independent variable. Also, participants agree with the scale items for ease-of-use (mean=3.81; SD=0.533), webpage characteristics (mean= 3.45; SD=0.53), website information (mean= 3.62; SD=0.48) and website design (mean= 3.29; SD=0.50) as a dependent variable. As shown above, ease-of-use is the most important feature (mean=3.81), followed by website information, then webpage characteristics and website design via SPSS software v.22.

Table (2) Descriptive Statistics for Measurement Items

Variables		Measurement Items	Mean	Std. Deviation	Skewness	Kurtosis
Gamification		GAM1	3.93	.766	-.116	-.750
		GAM2	3.95	.722	-.009	-.872
		GAM3	3.96	.729	-.129	-.620
		GAM4	3.89	.755	-.062	-.708
		GAM5	3.96	.766	-.129	-.805
		AVG_GAM	3.94	.510	-.239	-.320
	Ease-of-Use	EOU1	3.85	.795	.014	-.892
		EOU2	3.86	.769	-.065	-.655
		EOU3	3.90	.788	-.152	-.676
		EOU4	3.73	.759	-.012	-.482
		EOU5	3.76	.804	-.051	-.629
		AVG_ EOU	3.81	.533	-.425	.383
	Webpage Characteristics	WCH1	3.47	.765	-.050	-.369
		WCH2	3.51	.749	-.161	-.314
		WCH3	3.36	.682	-.108	-.335
		WCH4	3.47	.725	-.105	-.287
		AVG_ WCH	3.45	.530	-.634	.405
	Website Information	WINF1	3.49	.792	.040	-.429
		WINF2	3.65	.651	.499	-.694

Variables		Measurement Items	Mean	Std. Deviation	Skewness	Kurtosis
		WINF3	3.73	.651	.232	-.576
		WINF4	3.46	.797	.108	-.279
		WINF5	3.61	.732	-.079	-.262
		WINF6	3.80	.850	-.419	-.343
		AVG_ WINF	3.62	.476	-.659	.398
	Website Design	WDES1	3.27	.719	-.246	-.710
		WDES2	3.33	.684	-.386	-.645
		WDES3	3.29	.675	-.273	-.618
		WDES4	3.27	.678	-.299	-.691
		AVG_ WDES	3.29	.500	-.914	-.058

Exploratory Factor Analysis

The researcher based on Cronbach's alpha to assess internal consistency reliability with SPSS v.22. The results show that all constructs were consistent in their measurement items, as all Cronbach's alpha values were above the recommended minimum of 0.7 which is significant, indicating that the results of the observed variables are considered highly reliable (Field, 2013). Then, the scale items were submitted to exploratory factor analysis, to measure the construct validity of the measurement scales. The results of Kaiser–Meyer–Olkin of sampling adequacy (KMO) and Bartlett's test of sphericity reveal a higher value of KMO (=0.73) and the significance of Bartlett's test statistics ($p \leq 0.0001$) of all latent constructs (Hair et al., 2011). Finally, the construct validity results show that the items loaded well into the constructs, where all items reported factor loadings above 0.40, which are regarded as satisfactory factor loadings (Field, 2013), as well as total variance explained was above 50% (57.60) which means that factor analysis can explain 57.6 % of the variance in scale.

Structural Equation Modeling

The collected data were analyzed using the structural equation modeling approach (SEM) to test the research hypotheses. PLS-SEM is a key multivariate statistical modeling technique (more than one dependent variable) that researchers frequently use, as well as PLS-SEM, become particularly popular in social science disciplines in the past decades (Lin et al., 2020). PLS-SEM is the multi-stage model and suitable choice that combines the confirmatory factor analysis and multiple regression method that enables doing testing of hypotheses about multiple relationships (Chin, 1998; Lin et al., 2020). The researcher relies on PLS-SEM two-stage approach via using Smart PLS software Version. 3.3.2 (Ringle et al., 2015). The first stage includes the assessment of the measurement model through applying the confirmatory factor analysis (CFA) stage. Then, the second stage involves the assessment of the structural model for testing hypotheses.

PLS-SEM First Stage - Measurement Model Assessment

The evaluation of the measurement model is based on testing the item's reliability and construct's reliability and validity through confirmatory factor analysis (CFA). All latent variables are measured by reflective firstorder measurement items. The evaluation of the measurement model requires measuring convergent validity via average variance extracted (AVE), discriminant validity via Fornell-Larcker Criterion, and composite reliability (CR).

Convergent Validity

To measure the convergent validity, the researcher assess items loading (CFA), composite reliability (CR), and average variance extracted (AVE). According to Hair et al. (2014), it is recommended that the items loading shall be higher than 0.7 and any item loading less than 0.4 will be eliminated as it means that there is a cross-loading. All the measurement items load more strongly on their corresponding constructs than on other constructs in the theoretical model, where factors loading are more than 0.40, therefore the item deletion is not required. Therefore, factor loading results of all items are satisfactory according to the criterion.

On the other hand, the average variance extracted (AVE) shall exceed 0.50 of the total variances. AVE for all constructs ranging from 0.50 to 0.67 meets the requirement. In addition, composite reliability (CR) scores for each construct are greater than 0.7, which is the - benchmark for acceptable reliability (Hair et al., 2011), where all construct's CR ranged from 0.79 to 0. 89 as shown in table (3).

Table (3) Items Loading of Theoretical Model- Convergent Validity (AVE)-Composite Reliability (CR)

Constructs	GAM	EOU	WCH	WINF	WDES
GAM1	0.64				
GAM2	0.64				
GAM3	0.60				
GAM4	0.66				
GAM5	0.63				
EOU1		o.70			
EOU2		0.54			
EOU3		0.58			
EOU4		0.77			
EOU5		0.78			
WCH1			0.78		
WCH2			0.68		
WCH3			0.75		
WCH4			0.70		
WINF1				0.73	
WINF2				0.55	

Constructs	GAM	EOU	WCH	WINF	WDES
WINF3				0.50	
WINF4				0.65	
WINF5				0.66	
WINF6				0.77	
WDES1					0.78
WDES2					0.73
WDES3					0.73
WDES4					0.83
AVE	**0.60**	**0.55**	**0.53**	**0.50**	**0.58**
CR	**0.80**	**0.79**	**0.89**	**0.80**	**0.87**

Discriminant Validity

To investigate discriminant validity, it requires to compare the square roots of the average variance extracted (AVE) of each construct with its correlations with all other constructs. The square root of AVE shall be larger than the correlation to support the discriminant validity of measurement items (Fornell and Larcker, 1981; Chin, 1998). As shown in table (4), the numbers in the diagonal line (bolded) are the root square of AVE for each construct, as well as the numbers under the diagonal are the correlations of each construct with other constructs. As shown in table (4) the AVE was greater than the squared correlation coefficients, and hence confirming strong discriminant validity of all constructs.

Table (4) Constructs Correlation- Root Square Of AVE

Constructs	EOU	WCH	WDES	WINF	GAM
EOU	**0.65**				
WCH	0.18	**0.73**			
WDES	0.16	0.36	**0.76**		
WINFO	0.18	0.32	0.31	**0.60**	
GAM	0.15	0.31	0.26	0.25	**0.69**

PLS-SEM Second stage- Assessment of Structural Model

Table (5) below illustrates the results of the path coefficient of testing direct relationships between latent constructs. According to Hair et al. (2011), the significance of the relationships between constructs identified by P. value shall be less than 0.05 (P. value < 0.05) at a 95% significance level. As well as t-value shall be more than ±1.96. As shown in table (5) below, all hypotheses are significantly supported.

Table (5 Path Coefficient of Testing Hypotheses

Hypothesis	Relationship	Standard Beta (β)	T-Value	P. Value	Decision
H1	GAM⟶EOU	0.15	2.76	0.006	Supported**
H2	GAM⟶WCH	0.31	7.28	0.000	Supported***
H3	GAM⟶WINF	0.25	5.03	0.000	Supported***
H4	GAM⟶WDES	0.26	5.64	0.000	Supported***

*** Significance is 99.9%, p. value < 0.001, t-value ± 3.21.
** Significance is 99%, p. value < 0.01, t-value ± 2.58.
β ranged between (0-1).

Grounded on Technology Acceptance Model, the present study supports the research hypotheses since the findings show a positive significant relationship between gamification and website features (ease-of-use, webpage characteristics, website information, and website design) in the context of e-banking in Washington DC, United States of America.

Limitations and Future Research

The study is only applied to a gamified website in the e-banking context. Therefore, future studies may expand the sample frame in different contexts such as e-shopping, e-learning, recycling, fashion, etc., to enhance the validity of the research results. Second, the sample used in this study is biased towards the users of e-banking websites and has an online account rather than non-users. Furthermore, the respondents of the questionnaire are selected from only the users of e-banking in Washington DC, USA. Therefore, it is inadvisable to generalize the findings to the entire banking industry. Consequently, future studies shall apply the research model in other countries. As well as future studies can apply the conceptual model with different customer profiles such as younger and other nationalities or different cultures or backgrounds with different values and beliefs.

Conclusion and Implications

To sum up, the results of the current study show a significant relationship between gamification and website features in the context of e-banking based on the TAM model. Therefore, these results reveal that a bank website with elements and characteristics of games (a gamified bank website) has a superior positive effect on bank customers as compared to banks with a traditional, simple, and functional design. Consequently, electronic banking, game elements, dynamics, and mechanics shall receive greater attention from web designers and marketers in the future, as they receive higher attention from customers and can have a direct effect on the continuous use of e-banking (Deterding et al., 2011).

As shown above, there is a -conflict between researchers about website features. Some researchers divide website features into hedonic and utilitarian features. While other researchers classify website features into ease-of-use, webpage characteristics, website information, and web design. The current study focuses on website features in relation to ease-of-use, webpage characteristics, website information, and web design in e-banking websites. The findings of this study should help business managers in better understanding client perceptions using gamification as a critical tool for improving website functionality. While website features have become increasingly popular in management, and website managers must have a broad understanding of website design. The findings point website managers in the right path for assessing customers' perceptions of website features. It is self-evident that great website feature design allows a company to establish a positive client experience, and hence enhancing perceived value, positive attitude, and desired behavioral intentions all at the same time. Importantly, gamification in the context of online business - - is a powerful tool for convincing customers to learn more about financial products and fully embrace e-banking.

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