Heliyon 5 (2019) e02536

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.heliyon.com

Behavior intention of animation usage among university students

Dima Dajani [a,*], Abdallah S. Abu Hegleh [b]

[a] Al-Zaytoonah University of Jordan, Marketing Department, Jordan
[b] Picasso School "Malga for Design", Jordan

ARTICLE INFO

Keywords:
Psychology
Education
Animation
Learning value
Students' innovativeness
Jordanian universities

ABSTRACT

This research aims to test the antecedents that influence behavior intention of animation usage among marketing students in universities depending on the extended unified theory of acceptance and use of technology (UTAUT2) introduced by Venkatesh et al. (2012). Partial least square structural equation modeling approach was used to analyze information gathered from undergraduate marketing students in Jordanian universities. The results revealed that hedonic motivation, performance expectancy, students' innovativeness, learning value and effort expectancy were significant constructs influencing the behavior intention of animation usage. The research extended UTAUT2 in the field of animation usage by integrating the constructs of learning value and students' innovativeness to the model. The research provides practitioners and teachers in the marketing field with advantageous methods in their learning process.

1. Introduction

The revolution of technology allowed learners and innovators to collect massive supply of learning resources. Nevertheless, there is a difference between progressive technologies and the learners' comprehending of how they can benefit from these technologies, such as animation (Stebner et al., 2017; McElhaney et al., 2015; Chandler, 2004). Recently, animation has been included in the learning environment that depends on technology in developed countries (e.g., Arguel and Jamet, 2009). Animation is defined as a changing graphic visual arrangement which stimulates the view of a constant modification (Schnotz and Lowe, 2008). In this research, animation is defined as an art and a craft that crosses and is part of many disciplinarians in the field(s) of computers and social science, model making, sculpture, performance, and dance to produce a motion picture illustrating the movement of the drawn objects (Suki and Suki, 2017; Luzon and Leton, 2015; Mayer and Moreno, 2002).

The effectiveness of animation may vary based on learning objective levels and the learning abilities of students. In a technological learning environment, animation is frequently employed to enhance and facilitate the students' comprehension for difficult practices that change over time (Ainsworth and Van Labeke, 2004). Animation may serve various purposes and have many advantages. In marketing, animation use is entertaining and memorable (Hoyer and MacInnis, 2001). It provides the consumer with visual and emotional stimulation. It allows the brand to expand in an entertaining and professional method (Jin, 2011), and it gives an opportunity to the consumer to know about the product/service via virtual tours (Simon, 2006).

In addition, animation has a vital and creative role in the learning methods for marketing students. Students extensively watch online videos and online episodes (Lewis et al., 2013). During the year 2016, Techcrunch reported that more than 8 billion videos were seen daily using social media. This translates to an estimated 100 million hours of interactive animation that is imperative to use in the field of marketing (TechCrunch, 2016). This is important evidence for promoting marketing activities concerned with any kind of learning by using these new technologies. Currently, using animation in the education learning process is growing rapidly, and marketers must acquire methods for motivating student interest in this field (Dahl et al., 2018).

The students' perception and behavior intention to use animation is an initial step in implementing this new technology in the learning process. Extensive research has been directed in this area, such as the work of Suki and Suki (2017); Lowe and Boucheix (2016); Höffler et al. (2013); Wang et al. (2011); Moreno and Mayer (2007); Martins and Kellermanns (2004); and Tversky et al. (2002). However, there are limited or nonexistent studies investigating the behavior intention to use animation in less developed countries and specifically in Jordanian universities. Consequently, it is vital to accomplish this research to test factors that influence the students' behavior intention of animation usage.

* Corresponding author.
E-mail address: D.Aldajani@zuj.edu.jo (D. Dajani).

https://doi.org/10.1016/j.heliyon.2019.e02536
Received 17 January 2019; Received in revised form 20 May 2019; Accepted 25 September 2019

2. Theory

To determine consumer behavior, marketers use various behavior and technology models, such as the motivation-need theory by Maslow (1943); the theory of reasoned action (TRA) from Fishbein and Ajzen (1975); the diffusion of innovation theory (DOI) by Rogers (2003); the decomposed theory of planned behavior (DTPB) by Taylor and Todd (1995); the unified theory of acceptance and use of technology (UTAUT) by Venkatesh et al. (2003); and the unified theory of acceptance and use of technology (UTAUT2) model from Venkatesh et al. (2012). These models were originated from concepts in psychology and utilized to clarify technology usage.

Students' comprehension and usage of new technologies are one of the issues in marketing and includes the analysis of beliefs, attitude and behavior intention (Benbasat and Barki, 2007; Venkatesh et al., 2007). Numerous technology theories were used to explain the reasons behind students' adoption of technology. For example, Davis (1989) examined what causes the acceptance or rejection of information technologies usage among students. The idea of (TAM) is to explain the influence of external factors on the construct of belief, attitude toward behavior intention, and system usage (Ibrahim and Jaafar, 2011).

Furthermore, Venkatesh et al. (2003) integrated 8 theories of technology usage to produce the unified theory of acceptance and use of technology. The UTAUT introduced by Venkatesh et al. (2003) has been used by marketing scholars in studying behavior intention and usage behavior. The UTAUT has been examined for its validity and can calculate 70% of the variance intention use; consequently, this makes it an important theory for examining intention and usage behavior (Lee et al., 2013; Venkatesh et al., 2012). The main constructs of the UTAUT: performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) that influence the behavior intention (BI) of technology usage. The UTAUT illustrates gender, age, experience and voluntariness of use as moderators of the key relationships.

Recently, the unified theory of acceptance and use of technology (UTAUT) has been revised, resulting in the extended unified theory of acceptance and use of technology (UTAUT2) (Venkatesh et al., 2012). The UTAUT2 integrated 3 constructs, namely hedonic motivation (HM), price value (PV) and habit (H) to improve its predictive strength. Some demographic variables (age, gender, experience) were proposed to control the effects of constructs on behavior intention and technology usage (Venkatesh et al., 2012).

The literature indicates that the technology acceptance theories are significantly tested in the developed nations. The inadequate research effort on technology usage in the less developed countries shows conflicting results regarding the appropriateness and predictive power of these models in the developing countries (Dajani, 2016; Abu Shanab et al., 2010; Lin and Bhattacherjee, 2008). Researchers explain that the culture of a specific country and the type of technology investigated are the reasons behind this inconsistency (Abu Shanab et al., 2010; Steers et al., 2008). Consequently, this research validates and tests the aptness of the UTAUT2 in a different culture, specifically Jordan, using animation technology. Animation can create a competitive advantage among businesses worldwide to differentiate themselves from competitors; marketing students must motivate themselves to use new technologies such as animation to create innovative content in their marketing activities in the future (Oloko et al., 2014).

This research adapts UTAUT2 because of its comprehensiveness and power in explaining behavior intention compared to other technology theories. Additionally, a great number of the technology acceptance models, specifically UTAUT2, have not been investigated in less developed nations such as Arab countries (Alalwan et al., 2015; Kamoun and Almourad, 2014; Zhao et al., 2012). Moreover, Venkatesh et al. (2012) emphasized to examine UTAUT2 in various cultural settings to improve its applicability and substantiality. Venkatesh et al. (2012) stated that antecedents influencing the usage of new technologies differ according to the context, final user and technology. In comparison to UTAUT, UTAUT2 indicated an essential advancement in the distinction demonstrated in behavior intention (56%–74%) (Venkatesh et al., 2012). It is therefore coherent to adapt this model to examine the constructs that affect students' behavior intention to accept animation in the learning process at Jordanian universities.

Only a few or all of the UTAUT2 variables have been operationalized in different contexts. For example, Krishnaraju et al. (2013) investigated the effect of PE, EE, SI, FC, H and HM on the use of e-governance technology. In addition, Baptista and Oliveira (2015) considered the impact of PE, EE, H, and PV constructs on mobile banking and added cultural moderators to their conceptual model. Yuan et al. (2015) tested the effect of all the Venkatesh et al. (2012) constructs on the continuous usage of health applications without testing the effect of moderators. Moreover, the UTAUT2 model has been investigated in the learning context. For example, Lewis et al. (2013) explored the effect of PE, EE, SI and H constructs on the teacher's adoption of new technologies. Raman and Don (2013) analyzed the impact of PE, EE, SI, FC and HM constructs on learning management software.

Consequently, the literature indicated that the UTAUT2 theory has been examined in various settings. Additionally, researchers have operationalized some or all of the UTAUT2 constructs. The construct of the PV has been omitted from the UTAUT2 theory in the educational context and has not been replaced except for the Ain et al. (2015) study. The constructs of PV, HM and students' innovativeness (SINN) are inadequately discussed in the context of students' behavior intention of animation usage. Hence, there is a call for a framework that reflects these constructs. Thus, the current research objectives are to:

- Enhance the UTAUT2 model by adding the learning value (LV) construct and students' innovativeness (SINN) construct in the animation context.
- Examine the impact of PE, EE, SI, FC, LV, SINN and HM constructs on the students' behavior intention of animation usage.
- Examine whether the UTAUT2 model can be used in developing countries.

2.1. The research model and hypotheses

Fig. 1 illustrates the intended research model that explains the associations between the independent and dependent variable(s). Furthermore, the UTAUT2 model listed 3 moderating variables: age, gender and experience. This research excludes the controlling variable effect because other studies excluded them, such as the work of Morosan and DeFranco (2016); Alalwan et al. (2015); Oechslein et al. (2014); Raman and Don (2013). Moreover, this research eliminates the construct of habit because animation use is a recent knowledge that has not yet acquired general usage among students to form a habit (Oliveira et al., 2016). Moreover, several scholars removed or/and augmented constructs on UTAUT2 (e.g., Morosan and DeFranco, 2016; Baptista and Oliveira, 2015; Lian, 2015; Yang, 2013). This study integrated the learning value and students' innovativeness constructs to the model. Therefore, this study made some adjustments to the Venkatesh et al. (2012) model.

2.1.1. Behavior intention of animation usage

BI is referred to as the possibility of an individual to accomplish a task (Venkatesh et al., 2003). There is extensive usage of information technology to enhance the communication between students and teachers in universities (Adria and Rose, 2004). The construct of BI has an important effect on technology usage according to Venkatesh et al. (2003, 2012). In this research, the behavior intention is examined as a dependent variable (e.g., Lian, 2015) to measure students' acceptance to use animation in their education system.

2.1.2. Performance expectancy

It measures the level to which utilizing a specific innovation may help

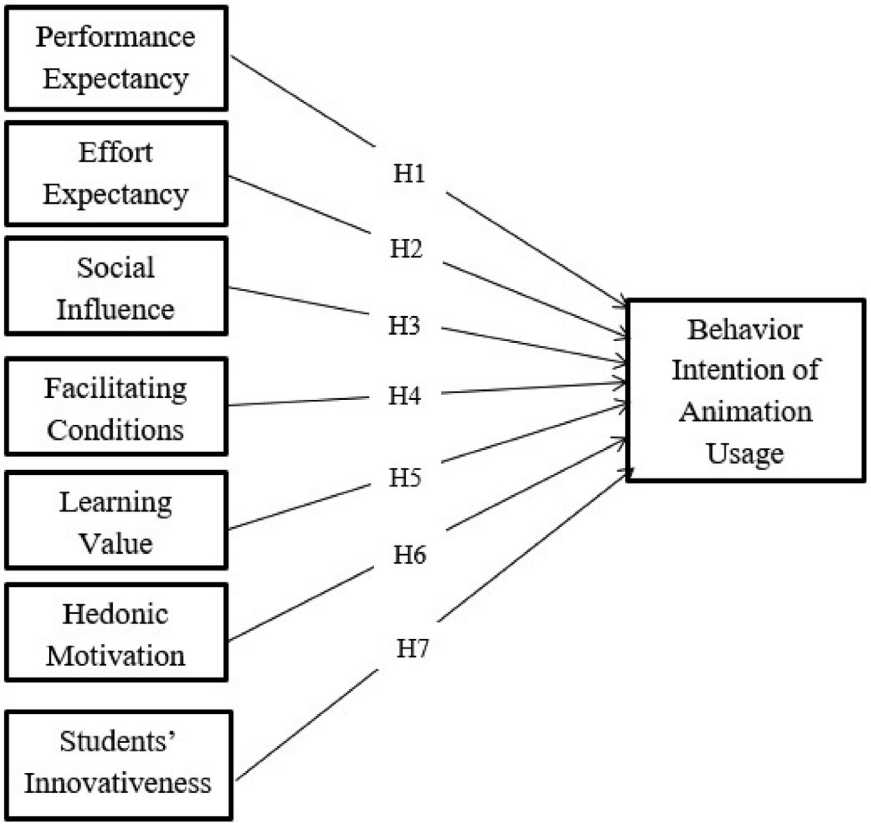

Fig. 1. Proposed research model. Adapted from Venkatesh et al. (2012).

consumers to attain their specific objectives (Venkatesh et al., 2012). The construct of PE has a strong impact on the behavior intention to use new technologies. Diversified characteristics of emerging technologies such as productivity, speed and clearance can promote the individuals' performance expectancy which can determine their technology use intentions and behavior (Suki and Suki, 2017; Baptista and Oliveira, 2015; Tosuntas et al., 2015; Lakhal et al., 2013). Thus, this research proposes the association between PE construct and BI of animation usage and applies it to the students' learning process. Consequently, the following research hypothesis is suggested:

H1. Performance expectancy has a positive impact on the students' behavior intention of animation usage.

2.1.3. *Effort expectancy*

It is known as the level of ease related to using the innovation (Venkatesh et al., 2012). In this research, EE construct shows the level of convenience and ease students feel when using new technology. In short, it measures the level of effort in the behavior intention to use animation. Yang (2013); Porter and Donthu (2006) expressed that EE construct has an influence on the students' use of new technologies. Therefore, this research predicts effort expectancy to be recognized as a significant indicator for the students' behavior intention to use animation to facilitate their learning process. Hence, the subsequent hypothesis is proposed:

H2. Effort expectancy has a positive impact on the students' behavior intention of animation usage.

2.1.4. *Social influence*

It is the level to which individuals believe that significant others think that they must use the system (Venkatesh et al., 2012). In universities, social influence refers to the support and motivation provided by instructors, friends and families to students. Oh and Yoon (2014) suggested that there is a strong association between the construct of SI and BI construct. Furthermore, we can infer that social influence plays a vital role in forecasting the intention of innovation usage in the learning process if faculty members and supervisors use the innovation. Hence, the next hypothesis is formulated:

H3. Social influence has a positive impact on the students' behavior intention of animation usage.

2.1.5. *Facilitating conditions*

Referred to as the level of the accessibility to the means and possessions to accomplish a task (Venkatesh et al., 2012). Students have positive attitudes and perform their tasks if sufficient resources are available. Facilitating conditions are validated as an important interpreter of acceptance and usage of new innovation (Baptista and Oliveira, 2015; Venkatesh et al., 2003). The students' interaction with new technologies is not available in the lack of facilitating conditions. Therefore, this research articulates the suggested hypothesis:

H4. Facilitating conditions have a positive impact on the students' behavior intention of animation usage.

2.1.6. *Hedonic motivation*

It is the acquired entertainment caused by technology usage (Venkatesh et al., 2012). Several researchers proposed the positive association between HM construct and BI construct. This relationship is supported by the work of Thong et al. (2006); Escobar-Rodríguez and Carvajal-Trujillo (2014); Brown and Venkatesh (2005); Childers et al. (2001). Derived from the literature review, this study recognized the vital role of HM construct (e.g., enjoyment) in clarifying the motives behind students' usage of new technologies (Brown and Venkatesh, 2005; Childers et al., 2001). Thus, the research uses HM construct as an antecedent of the students' behavior intention of new technologies usage. Therefore, this research proposes the subsequent hypothesis:

H5. Hedonic motivation has a positive impact on the students' behavior intention of animation usage.

2.1.7. Learning value

Price value is the balance between the apparent advantages of using a system and the expense of that system (Venkatesh et al., 2012). This is a cost–benefit association that influences the individual's behavior intention of a new technology usage as indicated by Venkatesh et al. (2012). Consumers perceive products or services of good value if the benefits of these goods are higher than the cost. In the current research, the value is related to the benefits achieved from the intention to use animation. However, students do not pay any price to learn the system. They spend time and effort to achieve benefits from animation use, according to Ain et al. (2015). Therefore, agreeing with the definition by Venkatesh et al. (2012) of price value, learning value construct is a balance between the obvious advantage of animation, and time spent on it, according to Ain et al. (2015). The following hypothesis is suggested to examine the association between the learning value and behavior intention of animation usage:

H6. Learning value has a positive impact on the students' behavior intention of animation usage.

2.1.8. Students' innovativeness

Agarwal and Prasad (1998) stated that personal innovativeness has an important role in explaining the intention of new technology usage. Rogers (2003) described innovativeness as the level to which a person is fairly ahead of other people in using the innovation. He categorized adopters in different stages, beginning with innovators who are early adopters and ending with laggards who are the last to use an innovation. Goldsmith et al. (2015) described innovativeness as the eagerness to try new things.

Personal innovativeness reflects the level to which a person would likely direct the way in trying new technologies (Yi et al., 2006). Similarly, Colby and Parasuraman (2003) stated that individual innovativeness, including (the desire to try out the technology, learn more about it, influence others and having faith in the ability of technology to provide real benefit) contributes to the technology adoption, while discomfort, insecurity and lack of control over technology will inhibit the adoption.

Extensive research was conducted to explore the role of innovativeness to determine behavior intention in different contexts (Thakur and Srivastava, 2015; Escobar-Rodríguez and Carvajal-Trujillo, 2014; San Martín and Herrero, 2012; Crespo and Bosque, 2008). The students' personal innovativeness has a great impact on the use of new technologies (Farooq et al., 2017; Lin et al., 2013; San Martín and Herrero, 2012; Herrero & Rodríguez Del Bosque, 2008; Citrin et al., 2000; Agarwal and Prasad, 1998). A student who is innovative is more likely to be ahead of his colleagues to experiment a new technology. Therefore, it is anticipated that high innovativeness among students will reinforce their behavior intention of animation usage. The explanation above led to the suggestion of the following hypothesis:

H7. Students' innovativeness has a positive impact on the behavior intention of animation usage.

3. Methods

3.1. Sampling and questionnaire administration

The sample of the current research includes undergraduate marketing students in Jordanian universities. Self-administered questionnaires were distributed to gather data from five major universities over a period of two weeks in April 2018. The five universities are a good representation of public and private Jordanian universities. The selected universities introduced animation learning in their marketing and management programs and have the intention to integrate animation learning in their curriculum. Currently, animation is used more extensively in the marketing department than the management department but it is not an obligatory requirement in the program.

The suggested sample size for this study is 370 undergraduate marketing students which is suitable for the size of the population, according to Sekaran (2003). A pilot study was made before the dissemination of the questionnaires. The researchers selected 30 marketing students and asked them to complete the questionnaire. Students were introduced to the objectives of the study and the researchers made sure that the students understood the questionnaire and all the questions were clear for them. The students read the questionnaire in the Arabic language and stated that the questionnaire was clear and understandable.

Then, 370 self-administered questionnaires were distributed randomly among marketing students in classroom settings ranging from freshman to senior years. These students have used animation at least once in their marketing classes. The researchers sent 120 electronic questionnaires using Google form, and 250 questionnaires were distributed physically by the researchers. Of the 370 students involved, 320 provided complete questionnaires. As a result, the actual number of surveys used in the analysis was 320, with a gross response rate of 86.4%.

The questionnaire had closed questions: Section 1 requested socio-demographic information, and Section 2 contained (29) measurement items that tested the factors affecting the students' behavior intention of animation usage as adapted from the literature review. A research survey was prepared in the English language and translated into Arabic then back-translated into English to ensure validity. A cover letter was added to each survey to ensure the confidentiality of the responses. The questionnaire contained 29 questions measured using a 5-point Likert scale varying from strongly disagree (1) to strongly agree (5). To increase the face validity, a list of academic arbitrators (eleven arbitrators) who specialized in the field of marketing, animation and innovation adoption evaluated the questionnaire before distributing it.

3.2. Measures

The dimensions used in the research were validated from prior research papers. Table 1 illustrates the applicable sources of the scale adjustment of each construct.

4. Analysis

The respondents include (48.1%) males and (51.9%) females as illustrated in Table 2. These percentages show a fair distribution of the questionnaire between males and females. The age sample is categorized on various levels, and the majority of the study sample is between (18–20) years old, followed by (21–23) years old and then (24–26) years old. The minimum percentage was above (27) years old. This means that the highest percentage of the sample represents young people (18–20) years old.

Table 1
Measurement adaptation.

Constructs	Sources
Performance Expectancy	Venkatesh et al. (2003),Venkatesh et al. (2012), Suki and Suki (2017)
Effort Expectancy	Venkatesh et al. (2003),Venkatesh et al. (2012), Suki and Suki (2017)
Social Influence	Venkatesh et al. (2003), Venkatesh et al. (2012), Suki and Suki (2017)
Facilitating conditions	Venkatesh et al. (2003), Venkatesh et al. (2012), Suki and Suki (2017)
Learning Value	Venkatesh et al. (2012), Paechter et al. (2010), Ain et al. (2015)
Hedonic Motivation	Venkatesh et al. (2012), Ain et al. (2015)
Students' Innovativeness	Yi et al. (2006), Agarwal and Prasad (1998), Mahat et al. (2012)
Behavior Intention	Venkatesh et al. (2003), Venkatesh et al. (2012)

Table 2
Demographic sample characteristics–gender, age.

	Frequency	Percent	Valid Percent	Cumulative Percent
Gender				
Male	154	48.1	48.1	48.1
Female	166	51.9	51.9	100.0
Total	320	100.0	100.0	
Age				
18–20	166	51.9	51.9	51.9
21–23	111	34.7	34.7	86.6
24–26	31	9.7	9.7	96.3
27 and over	12	3.7	3.7	100.0
Total	320	100.0	100.0	

Table 3
Descriptive statistics of the research variables.

Items	Mean	Standard Deviation	Excess Kurtosis	Skewness
PE1	4.456	0.724	2.333	-1.444
PE2	4.404	0.742	2.105	-1.330
PE3	4.490	0.655	1.181	-1.161
PE4	4.370	0.679	1.751	-1.012
EE1	4.234	0.723	1.127	-0.832
EE2	3.826	0.897	-0.254	-0.383
EE3	4.099	0.778	-0.096	-0.533
EE4	3.927	0.897	-0.090	-0.574
SI1	3.858	0.846	-0.328	-0.393
SI2	3.806	0.869	-0.470	-0.333
SI3	3.957	0.863	-0.071	-0.583
SI4	3.897	0.935	-0.450	-0.497
FC1	3.643	1.115	-0.682	-0.464
FC2	3.826	0.817	-0.333	-0.351
FC3	3.594	0.859	-0.419	-0.197
FC4	3.578	0.946	-0.862	-0.025
LV1	4.226	0.775	-0.227	-0.678
LV2	3.856	0.759	-0.549	-0.114
LV3	3.983	0.730	-0.040	-0.379
HM1	3.875	0.714	0.779	-0.585
HM2	3.817	0.724	0.625	-0.568
HM3	3.551	0.915	-0.014	-0.446
HM4	3.854	0.727	0.903	-0.619
SINN1	4.344	0.685	0.794	-0.879
SINN2	4.121	0.712	0.471	-0.555
SINN3	4.237	0.777	0.462	-0.848
BI1	4.295	0.768	0.038	-0.833
BI2	4.071	0.851	0.698	-0.830
BI3	4.236	0.830	1.188	-1.054

PE: Performance Expectancy; LV: Learning Value; EE: Effort Expectancy; HM: Hedonic Motivation; SI: Social Influence; SINN: Students' Innovativeness; FC: Facilitating Conditions; BI: Behavior Intention.

The descriptive analyses of the data are illustrated in Table 3. The results show that means scored higher than 3.5 on all items (29 items) which is a relatively positive indication for the answers.

A partial least square structural equation modeling approach using SmartPLS (Version 3.2.8) is employed to analyze the collected data through two stages. Step 1: Measurement model to assess the reliability and validity of the theoretical constructs. Step 2: Structural model to represent the (paths) associations between the constructs. PLS is used because it is an entrenched technique for calculating path coefficients in a structural model and has the ability to model latent constructs when data is not normally distributed and samples are small to medium size (Hair et al., 2013). PLS is considered as the most comprehensive analytical system (McDonald, 1996, p. 240) that is extensively employed in management information system research (Marcoulides and Saunders, 2006), marketing (Hair et al., 2012), and various disciplines. It can measure reflective models and forecast the behavior of the relationship between variables and investigate the fundamental theoretical concept (Hair et al., 2013).

4.1. Measurement model

The research examines the convergent validity, reliability, and discriminant validity to evaluate the measurement model. To fulfill convergent validity, three steps are needed (Hair et al., 1998; Fornell and Larcker, 1981). First, the entire item loadings should be higher than 0.65. Second, composite reliabilities (CR) must be above 0.8. Third, the average variance extracted (AVE) should be higher than 0.5. The results of this analysis confirmed that the entire item loadings were higher than the recommended value of 0.65. CR values are between 0.810 and 0.891. The AVE ranges between 0.520 and 0.780. Consequently, convergent validity is fulfilled in this study. To check the reliabilities of latent variables, CR and AVE should be above 0.8 and 0.5, respectively. The reliability for both is acceptable and presents clear confirmation of the reliability of the model's measurements as illustrated in Table 4. Discriminant validity illustrates that the square root of the AVE (Diagonal Values) of each variable is greater than its parallel correlation coefficients (Fornell and Larcker, 1981) as illustrated in Table 5. Thus, the measurement model showed that there was no great relationship between variables. This implies the model fitness for the proposed research.

4.2. Structural model

The research structural model and its associated hypotheses are tested depending on the calculated values of path coefficients (β) and significance T-level (T-Values), and the (R^2) which reflects the strength of the predictive variables on the related construct. The coefficient of the R^2 for the dependent variable (behavior intention of animation usage) indicates that the five independent variables (PE, EE, LV, HM and SINN) explain 48.4% of the intention to use variance. The value of SRMR = 0.068, RMStheta = 0.11, and the NFI = 0.918. Following a conservative approach, an SRMR (RMStheta) values of less than 0.08 (0.12) indicates good fit (Hair et al., 2017).

Bootstrap resampling methods were utilized to test the statistical significance of the propositions (Henseler et al., 2009). Table 6 illustrates the supported hypotheses of the adapted model. The results indicate a strong positive effect for five hypotheses H_1, H_2, H_5, H_6, H_7, while H_3, H_4 is not supported. Consequently, **H_1** the path coefficient for performance expectancy is (β = 0.195) and has a value of (T-Value = 4.814) at a significant level of ($p < 0.05$). This outcome refers to the acceptance of the hypothesis. It could be concluded that there is a positive effect of PE on students' behavior intention of animation usage. **H_2** the path coefficient for effort expectancy is (β = 0.100) and has a value of (T-Value = 2.587) at a significant level of ($p < 0.05$). This consequence refers to the acceptance of the hypothesis. It could be concluded that there is a positive effect of EE on students' behavior intention of animation usage.

H_5 the path coefficient for learning value is (β = 0.147) and has a (T-Value = 3.515) at a significant level of ($p < 0.05$). This outcome refers to the acceptance of the proposition. It could be concluded that there is a positive impact of learning value on students' behavior intention of animation usage. **H_6** the path coefficient for the HM is (β = 0.277) and has a value of (T-Value = 6.058) at a significant level of ($p < 0.05$). This outcome refers to the acceptance of the proposition. It could be concluded that there is a positive impact of HM on students' behavior intention of animation usage. **H_7** the path coefficient for the students' innovativeness is (β = 0.180) and has a (T-Value = 4.007) at a significant level of ($p < 0.05$). This outcome refers to the acceptance of the proposition. It could be concluded that there is a positive effect of students' innovativeness on students' behavior intention of animation usage.

H_3 the results for SI is β = 0.025, T-Value = 0.603 and $p > 0.05$. This result refers to the rejection of the proposition. Therefore, **H_3** is not supported, and SI has no positive impact on the students' behavior intention of animation usage. The results for facilitating conditions is β = 0.005, T-Value = 0.152 and $p > 0.05$. This result rejects the hypothesis. Therefore, **H_4** is not supported, and facilitating conditions (FC) have no positive impact on the students' behavior intention of animation usage.

Table 4
Convergent validity of the research constructs.

Items	Loadings	CR	AVE	Reference
Performance Expectancy				
PE1: Using animation is a useful learning process.	**0.782**	**0.891**	**0.671**	Venkatesh et al. (2003), Venkatesh et al. (2012), Suki and Suki (2017)
PE2: Using animation helps me to better achieve my learning duties.	**0.828**			
PE3: Using animation increases my learning process productivity.	**0.829**			
PE4: Using animation enhances my possibilities of earning better grades.	**0.837**			
Effort Expectancy				
EE1: Using animation is clear and comprehensible.	**0.704**	**0.823**	**0.539**	Venkatesh et al. (2003), Venkatesh et al. (2012), Suki and Suki (2017)
EE2: It is simple to become proficient when using animation.	**0.748**			
EE3: Using animation is easy.	**0.708**			
EE4: Learning to work with animation is simple.	**0.774**			
Social Influence				
SI1: Individuals who affect my actions believe that I must use animation.	**0.692**	**0.810**	**0.516**	Venkatesh et al. (2003), Venkatesh et al. (2012), Suki and Suki (2017)
SI2: Individuals who are significant to me believe that I must use animation.	**0.772**			
SI3: Teachers are supportive to use animation.	**0.732**			
SI4: Overall, the university may support animation usage.	**0.674**			
Facilitating Conditions				
FC1: I get the important means to use animation.	**0.683**	**0.821**	**0.535**	Venkatesh et al. (2003), Venkatesh et al. (2012), Suki and Suki (2017)
FC2: I possess the important information to use animation.	**0.794**			
FC3: Using animation is well-matched with other systems I use in the learning process.	**0.767**			
FC4: Individual(s) is there to help me if I face any problem in using animation.	**0.676**			
Learning Value				
LV1: Animation provides me with the opportunity to control my own learning time.	**0.731**	**0.873**	**0.697**	Venkatesh et al. (2012), Paechter et al. (2010), Ain et al. (2015)
LV2: Animation provides me a chance to enhance my knowledge and to control my success.	**0.864**			
LV3: Animation helps me to immediately and easily communicate my knowledge with others (e.g., short movies, animated images, forums, etc.)	**0.901**			
Hedonic Motivation				
HM1: Interaction with using animation is fun in my learning process.	**0.796**	**0.866**	**0.619**	Venkatesh et al. (2012), Ain et al. (2015)
HM2: I find using animation is thrilling in my learning process.	**0.794**			
HM3: I find using animation is enjoyable in my learning process.	**0.800**			
HM4: I find using animation is exciting in my learning process.	**0.756**			
Students' Innovativeness				
SINN1: If I knew about a new innovation, I would discover new ways to try it (e.g., animation).	**0.818**	**0.841**	**0.638**	Yi et al. (2006), Agarwal and Prasad (1998), Mahat et al. (2012)
SINN2: I would be the first among my friends to try out a new technology.	**0.810**			
SINN3: Generally, I seek to experiment new technologies (e.g., animation)	**0.768**			
Behavior intention				
BI1: I expect to use animation in the next semester.	**0.847**	**0.886**	**0.721**	Venkatesh et al. (2012), Venkatesh et al. (2003)
BI2: I would advise my friends of animation usage in the following semester.	**0.867**			
BI3: I would tell constructive things about animation usage in my learning process.	**0.833**			

The final findings of PLS analysis are illustrated in Fig. 2. In addition, the outcome of the tested hypotheses is illustrated in Table 6.

5. Results & discussion

The research investigated the antecedents that have an effect on the students' behavior intention of animation usage by adapting the UTAUT2 model. The formulated hypotheses were tested by SmartPLS (Version 3.2.8). The proposed structural model is acceptable and the relevance constructs have a notable explanatory capacity in terms of the variance of the factors that influence the students' behavior intention of animation usage.

Empirically, the outcome of the analyses indicated that the linkage between HM and students' behavior intention of animation usage is the most significant. Additionally, students find that interaction with using animation is fun and thrilling in their learning process. Consequently, they felt good when using animation in the learning process. These results are consistent with Farooq et al. (2017); Escobar-Rodríguez and Carvajal-Trujillo (2014); Raman and Don (2013); Saadé and Kira (2006).

The construct of performance expectancy also has an important influence on the students' behavior intention of animation usage. Students find using animation is a useful learning process and enables them to accomplish tasks better in the learning process. Consequently, this increases the productivity of the students and the chances of earning a good grade. These vital findings are aligned with the work of several researchers, such as Stebner et al. (2017); Chauhan and Jaiswal (2016); Lowe and Boucheix (2016); Luzon and Leton (2015); Tosuntas et al. (2015); Suki and Suki (2013).

Moreover, the students' innovativeness has a significant influence on the behavior intention of animation usage. It is apparent that undergraduates who are aware of a new technology would seek methods to experiment with it (e.g., animation). A student who is innovative would be the first among his colleagues to experiment a new technology. Students would like to try out new technologies such as animation (San

Table 5
Discriminant validity of the research constructs.

	BI	EE	FC	HM	LV	PE	SINN	SI
BI	**0.849**							
EE	0.431	**0.734**						
FC	0.242	0.350	**0.732**					
HM	0.581	0.416	0.272	**0.786**				
LV	0.504	0.378	0.259	0.563	**0.835**			
PE	0.503	0.313	0.216	0.418	0.407	**0.819**		
SINN	0.528	0.465	0.203	0.465	0.402	0.513	**0.799**	
SI	0.423	0.535	0.357	0.504	0.383	0.303	0.485	**0.718**

Bold signifies the square root of the AVE.

Table 6
Results of the tested hypotheses.

	Path Coefficient (β	T-Values (Bootstrapping	P-Values (Bootstrapping
PE -> BI	0.195	4.814	0.000
EE -> BI	0.100	2.587	0.010
SI -> BI	0.025	0.603	0.547
FC -> BI	0.005	0.152	0.879
HM -> BI	0.277	6.058	0.000
LV -> BI	0.147	3.515	0.000
SINN -> BI	0.180	4.007	0.000

Martín and Herrero, 2012; Herrero & Rodríguez Del Bosque, 2008; Citrin et al., 2000; Legris et al., 2003; Agarwal and Prasad, 1998).

The hypothesized association between learning value and the students' behavior intention to use animation was significant. It shows that animation provides students with an opportunity to decide the pace of their personal learning. Animation provides them with a chance to improve their comprehension and to control their success and in less time. A related outcome was addressed by Ain et al. (2015), and Dodds et al. (1991) who reported that individuals' eagerness to purchase a commodity depends on the perception of value.

Furthermore, the construct of EE has a significant impact on the students' behavior intention of animation usage. Students who have great technological skills are more expected to use new innovations in their learning process (Baydas, 2015; Sadaf et al., 2012; Giallamas and Nikolopoulou, 2010; Sang et al., 2010). Students recognized that their experience with using animation is obvious, easy and comprehensible. This outcome clarifies the significant role of effort expectancy on the behavior intention (Raman and Don, 2013; Yang, 2013; Venkatesh et al., 2012; Dulle and Minishi-Majanja, 2011). The outcome reinforces the assumption that students are able to operate and use a new technology, despite of its complexity (Yi et al., 2006). Consequently, these results confirm that an advanced and convenient learning environment reduces the effort expectancy. Related outcome was also found by Heerink et al. (2009) and Cheng et al. (2008).

In addition, the outcome of this research analyses showed that SI did not have any influence on the behavior intention of animation usage. Moreover, students did not consider the community surrounding them to have an impact on their behavior. Perhaps the SI does not have an effect

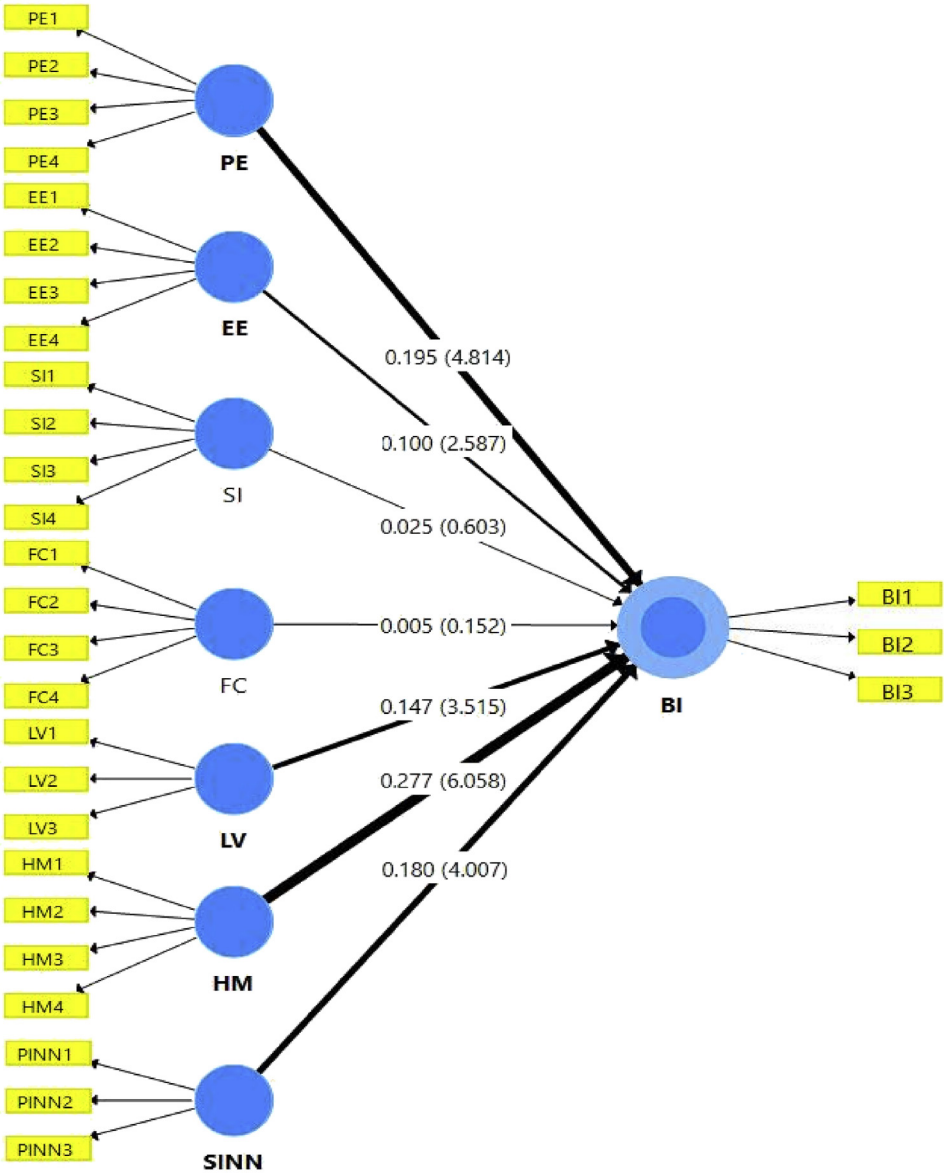

Fig. 2. Results of PLS analysis (path coefficients and T-Values).

on the behavior intention because it is not used extensively in the department and it is also not incorporated in the curriculum. Thus, social influence is not supported. This outcome was coherent with the work of Suki and Suki (2017); Chauhan and Jaiswal (2016). Furthermore, facilitating conditions (FC) do not affect the students' behavior intention of animation usage. Students conclude that they do not have the essential means to use new technologies, and the use of new technologies is not adaptable with other systems, such as the use of animation in their learning process, while Venkatesh et al. (2012) suggested that FC directly influence behavior intention. In contrast, the study finding does not support that claim. This finding aligns with previous research (El-Masri and Tarhini, 2017; Tarhini et al., 2017; Zuiderwijk et al., 2015; Joo et al., 2014).

6. Related work

6.1. Implications and further research

The present research enriches the scientific knowledge in the subject of education. The findings have meaningful implications that provide educators and practitioners with useful guidelines for successful e-learning methods at universities. Management and educators of Jordanian universities should recognize the animation usage as an effective educational method in students' learning process. Different courses may be organized for marketing students to train them to use animation. Consequently, the same experience could be provided for various departments that may need to use animation in the future. This will provide graduates who are very advanced and innovative in their communication skills.

The results indicated that students should be offered an enjoyable exposure by the addition of animation in their learning process. The management of universities should guarantee the usefulness and the ease of using animation programs for their students. Including animation in the curriculum is a must to increase the creativity and communication skills among students. Teachers and managers should realize the positive learning value of animation and the positive students' innovativeness. This allows them to speed up the process of integrating animation learning in the students' curriculum. Finally, management should provide the necessary resources (animation programs, technological equipment, and labs) to facilitate the use of animation in the classrooms.

The research has some restrictions that could be avoided in potential research. For example, the sample could be extended to other departments, such as management department. This will increase the sample size of the research and allow for testing the generalizability of the results. Furthermore, a replication of this research in other Arab countries will enhance generalizability. Additionally, further studies should explore cross-cultural differences among students in various parts of the world. Future research should examine the teachers' acceptance to use animation. A comparative study between teaching with and without animation could be conducted. Finally, it would be useful to test the influence of vital moderators, such as age, gender and experience on the behavior intention of animation usage.

7. Conclusion

The current research tested the variables that influence the students' behavior intention of animation usage by adapting the UTAUT2 model introduced by Venkatesh et al. (2012). The data were analyzed and the hypotheses were tested by using SmartPLS (Version 3.2.8) and SPSS (Version 24) programs. The extended model had a good measurement model fit and can explain the behavior intention to use animation in universities. Additionally, the research structural model proved the match between the collected data and the research model and supported the hypothesized associations. The outcome of the research confirmed that hedonic motivation, performance expectancy, students' innovativeness, learning value and effort expectancy were significant, and explained (48.4%) of the students' behavior intention of animation usage. Hedonic motivation had the strongest and largest effects in explaining students' behavior intention. This is followed by performance expectancy, students' innovativeness, learning value and effort expectancy, respectively.

The research offers enlightenment regarding the students' behavior intention of animation usage. The research extended the UTAUT2 model by adding the LV construct and the SINN construct. The findings adjust UTAUT2 in the field of animation acceptance. Studies that have used UTAUT2 have ignored the construct of price value in the field of education and did not replace it. Furthermore, students' innovativeness was scantly discussed in the context of animation usage. Students perceived the learning value of animation exceeds their time and effort learning it. Therefore, they had a positive behavior intention of animation usage. In addition, students' innovativeness led to a positive impact on the behavior intention of animation usage. Moreover, the analysis of the impact of PE, EE, SI, FC, LV, HM and SINN on students' intention of animation usage validated the UTAUT2 model applicability in the animation learning context. Depending on the research outcome, it was concluded that the UTAUT2, which was initially suggested and examined in developed countries, can also justify the behavior intention of animation usage in Arab countries, such as Jordan.

Declarations

Author contribution statement

D. Dajani: Conceived and designed the experiments; Analyzed and interpreted the data Contributed reagents, materials, analysis tools or data; Wrote the paper.

A. Abu Hegleh: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

References

Abu Shanab, E., Pearson, J.M., Setterstrom, A.J., 2010. Internet banking and consumers' acceptance in Jordan: the unified model's perspective. Commun. Assoc. Inf. Syst. 26 (23), 493–524.

Adria, M., Rose, T., 2004. Technology, preprocessing, and resistance - a comparative case study of intensive classroom teaching. J. Educ. Bus. 80 (1), 53–60.

Agarwal, R., Prasad, J., 1998. A conceptual and operational definition of personal innovativeness in the domain of information technology. Inf. Syst. Res. 9 (2), 204e215.

Ain, N., Kaur, K., Waheed, M., 2015. The influence of learning value on learning management system use: an extension of UTAUT2. Inf. Dev. 32 (5), 1306–1321.

Ainsworth, S., Van Labeke, N., 2004. Multiple forms of dynamic representation. Learn. Instr. 14 (3), 241–256.

Alalwan, A.A., Dwivedi, Y.K., Rana, N.P., Lal, B., Williams, M.D., 2015. Consumer adoption of Internet banking in Jordan: examining the role of hedonic motivation, habit, self-efficacy and trust. J. Financ. Serv. Mark. 20 (2), 145–157.

Arguel, A., Jamet, E., 2009. Using video and static pictures to improve learning of procedural contents. Comput. Hum. Behav. 25 (2), 354–359.

Baptista, G., Oliveira, T., 2015. Understanding mobile banking: the unified theory of acceptance and use of technology combined with cultural moderators. Comput. Hum. Behav. 50, 418–430.

Baydas, O., 2015. A Model Proposal for the Intention of the Use of Information Technology in Teachers' Candidate' Future Course. Unpublished Doctoral Dissertation. Ataturk University, Turkey.

Benbasat, I., Barki, H., 2007. Quo Vadis, TAM? J. AIS 8 (4), 212–218.
Brown, S.A., Venkatesh, V., 2005. Model of adoption of technology in the house hold: a base line model test and extension incorporating house hold life cycle. MIS Q. 29 (4), 399–426.
Chandler, P., 2004. The crucial role of cognitive processes in the design of dynamic visualizations. Learn. Instr. 14, 353e357.
Chauhan, S., Jaiswal, M., 2016. Determinants of acceptance of ERP software training in business schools: empirical investigation using UTAUT model. Int. J. Manag. Educ. 14, 248–262.
Cheng, D., Liu, G., Song, Y.-F., Qian, C., 2008. Adoption of internet banking: an integrated model. 4th International Conference on Wireless Communications, Networking and Mobile Computing, 2008. WiCOM '08, pp. 1–4.
Childers, T.L., Carr, C.L., Peck, J., Carson, S., 2001. Hedonic and utilitarian motivations for online retail shopping behavior. J. Retail. 77 (4), 511–535.
Citrin, A.V., Sprott, D.E., Silverman, S.N., Stem, D.E., 2000. Adoption of internet shopping: the role of consumer innovativeness. Ind. Manag. Data Syst. 100 (7), 294e300.
Colby, C.L., Parasuraman, A., 2003. Technology still matters. Mark. Manag. 12 (4), 28–33.
Crespo, A., Bosque, I., 2008. The effect of innovativeness on the adoption of B2C e-commerce: a model based on the theory of planned behavior. Comput. Hum. Behav. 24 (6), 2830e2847.
Dahl, Andrew J., Peltier, James W., Schibrowsky John, A., 2018. Critical thinking and reflective learning in the marketing education literature: a historical perspective and future research needs. J. Mark. Educ. 40 (2), 101–116.
Dajani, D., 2016. Using the unified theory of acceptance and use of technology to explain e-commerce acceptance by Jordanian travel agencies. J. Comp. Int. Manag. 19 (1), 121–144.
Davis, F.D., 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. 13 (3), 319–339.
Dodds, W.B., Monroe, K.B., Grewal, D., 1991. Effects of price, brand, and store information on buyers' product evaluations. J. Mark. Res. 28 (3), 307–319.
Dulle, F.W., Minishi-Majanja, M.K., 2011. The suitability of the unified theory of acceptance and use of technology (UTAUT) model in open access adoption studies. Inf. Dev. 27 (1), 32–45.
El-Masri, M., Tarhini, A., 2017. Factors affecting the adoption of e-learning systems in Qatar and USA: extending the unified theory of acceptance and use of technology 2 (UTAUT2). Educ. Technol. Res. Dev. 65 (3), 1–21.
Escobar-Rodríguez, T., Carvajal-Trujillo, E., 2014. Online purchasing tickets for low cost carriers: an application of the unified theory of acceptance and use of technology (UTAUT) model. Tour. Manag. 43, 70–88.
Farooq, M.S., Salam, M., Jaafar, N., Fayolle, A., Ayupp, K., Radovic-Markovic, M., Sajid, A., 2017. Acceptance and use of lecture capture system (LCS) in executive business studies: extending UTAUT2. Interact. Technol. Smart Educ. 14 (4).
Fishbein, M., Ajzen, I., 1975. Belief, Attitude, Intention, and Behavior: an Introduction to Theory and Research. Addison-Wesley, Reading, Mass.
Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. J. Mark.
Giallamas, V., Nikolopoulou, K., 2010. In-service and pre-service early childhood teachers' views and intentions about ICT use in early childhood settings: a comparative study. Comput. Educ. 55, 333e341.
Goldsmith, R.E., Clark, R.A., Goldsmith, E.B., 2015. The desire for unique consumer products, innovativeness, and conformity. Proceedings of the 2007 Academy of Marketing Science (AMS) Annual Conference. Springer International Publishing, p. 206e210.
Hair, J.F., Anderson, R.E., Tatham, R.L., Black, W.C., 1998. Multivariate Data Analysis, fifth ed. Prentice-Hall, London.
Hair, J.F., Hult, G.T.M., Ringle, C., Sarstedt, M., 2013. A Primer on Partial Least Squares Structural Equation Modelling (PLS-SEM). Sage Publications.
Hair, J.F., Sarstedt, M., Ringle, C.M., Mena, J.A., 2012. An assessment of the use of partial least squares structural equation modeling in marketing research. J. Acad. Mark. Sci. 40 (3), 414–433.
Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., 2017. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), second ed. Sage, Thousand Oaks.
Heerink, M., Krose, B., Wielinga, B., Evers, V., 2009. Measuring the influence of social abilities on acceptance of an interface robot and a screen agent by elderly users. Proceedings of the 23rd British HCI Group Annual Conference on People and Computers: Celebrating People and Technology. British Computer Society, Swinton, UK, pp. 430–439. http://dl.acm.org/citation.cfm?id=1671011.1671067.
Henseler, J., Ringle, C.M., Sinkovics, R.R., 2009. The Use of Partial Least Squares Path Modeling in International Marketing New Challenges to International Marketing. Emerald Group Publishing Limited, pp. 277–319.
Herrero, A., Rodríguez Del Bosque, I., 2008. The effect of innovativeness on the adoption of B2C e-commerce: a model based on the theory of planned behavior. Comput. Hum. Behav. 24 (6), 2830e2847.
Höffler, T.N., Schmeck, A., Opfermann, M., 2013. Static and dynamic visual representations: individual differences in processing. In: Schraw, G., McCrudden, M.T., Robinson, D. (Eds.), Learning through Visual Displays. Information Age Publishing, Charlotte, NC, p. 133e163.
Hoyer, W.D., MacInnis, D.J., 2001. Consumer Behaviour, second ed. Houghton Mifflin Company, Boston.
Ibrahim, R., Jaafar, A., 2011. User acceptance of educational games: a revised unified theory of acceptance and use of technology (UTAUT). World Acad. Sci. Eng. Technol. 53, 551–557.
Jin, C.H., 2011. The role of animation in the consumer attitude formation: exploring its implications in the tripartite attitudinal model. J. Target. Meas. Anal. Mark. 19, 99–111 published online 23 May 2011.
Joo, Y.J., Joung, S., Shin, E.K., Lim, E., Choi, M., 2014. Factors influencing actual use of mobile learning connected with e-learning. Int. J. Comput. Sci. Inf. Technol. 6 (6), 169–176.
Kamoun, F., Almourad, M.B., 2014. Accessibility as an integral factor in e-government web site evaluation: the case of Dubai e-government. Inf. Technol. People 27 (2), 208–228.
Krishnaraju, V., Mathew, S.K., Sugumaran, V., 2013. Role of web personalization in consumer acceptance of e-government services.
Lakhal, S., Khechine, H., Pascot, D., 2013. Student behavioral intentions to use desktop video conferencing in a distance course: integration of autonomy to the UTAUT model. J. Comput. High. Educ. 25 (2), 93e121.
Lee, S.G., Trimi, S., Kim, C., 2013. Innovation and imitation effects' dynamics in technology adoption. *Ind. Manag. Data Syst.* 103 (6), 772–799.
Legris, P., Ingham, J., Collerette, P., 2003. Why do people use information technology? A critical review of the technology acceptance model. Inf. Manag. 40, 191–204.
Lewis, C.C., Fretwell, C.E., Ryan, J., Parham, J.B., 2013. Faculty use of established and emerging technologies in higher education: a unified theory of acceptance and use of technology perspective. Int. J. High. Educ. 2 (2), 22–34.
Lian, J.W., 2015. Critical factors for cloud-based e-invoice service adoption in Taiwan: an empirical study. Int. J. Inf. Manag. 35 (1), 98–109.
Lin, C.P., Bhattacherjee, A., 2008. Elucidating individual intention to use interactive information technologies: the role of network externalities. Int. J. Electron. Commer. 13 (1), 85–108.
Lin, S., Zimmer, J.C., Lee, V., 2013. Podcasting acceptance on campus: the differing perspectives of teachers and students. Comput. Educ. 68, 416e428.
Lowe, R.K., Boucheix, J.M., 2016. Principled animation design improves comprehension of complex dynamics. Learn. Instr. 45, 72–84.
Luzon, J.M., Leton, E., 2015. Use of animated text to improve the learning of basic mathematics. Comput. Educ. 88, 119–128.
Mahat, J., Ayub, A.F.M., Luan, S., 2012. An assessment of students' mobile self-efficacy, readiness and personal innovativeness towards mobile learning in higher education in Malaysia. Proc.-Social Behav. Sci. 64, 284–290.
Marcoulides, G.A., Saunders, C., 2006. PLS: a silver bullet? MIS Q. 30 (2), iii–ix.
Martins, L.L., Kellermanns, F.W., 2004. A model of business school students' acceptance of web based course management system. Acad. Manag. Learn. Educ. 3, 7–26.
Maslow, A.H., 1943. A theory of human motivation. Psychol. Rev. 50 (4), 370–396.
Mayer, R.E., Moreno, R., 2002. Animation as an aid to multimedia learning. Educ. Psychol. Rev. 14 (1).
McDonald, R.P., 1996. Path analysis with composite variables. Multivar. Behav. Res. 31 (2), 239–270.
McElhaney, K., Chang, H., Chiu, J.L., Linn, M.C., 2015. Evidence for effective uses of dynamic visualizations in science curriculum materials. Stud. Sci. Educ.
Moreno, R., Mayer, R.E., 2007. Interactive multimodal learning environments. Educ. Psychol. Rev. 19 (3), 309–326.
Morosan, C., DeFranco, A., 2016. It's about time: revisiting UTAUT2 to examine consumers' intentions to use NFC mobile payments in hotels. Int. J. Hosp. Manag. 53, 17e29.
Oechslein, O., Fleischmann, M., Hess, T., 2014. January). An application of UTAUT2 on social recommender systems: incorporating social information for performance expectancy. 2014 47th Hawaii International Conference on System Sciences. IEEE, pp. 3297–3306.
Oh, J., Yoon, S., 2014. Predicting the use of online information services based on a modified UTAUT model. Behav. Inform. Technol. 33 (7), 716–729.
Oliveira, T., Thomas, M., Baptista, G., Campos, F., 2016. Mobile payment: understanding the determinants of customer adoption and intention to recommend the technology. Comput. Hum. Behav. 61, 404–414.
Oloko, M., Anene, E.B., Kiara, P.G., Kathambi, I., Mutulu, J., 2014. Marketing Strategies for profitability: a case of safaricom ltd in Kenya telecommunication industry. Int. J. Sci. Res. Publ. 4 (5). Available at. http://www.ijsrp.org/research-paper-0514/ijsrp-p2943.pdf.
Paechter, M., Maier, B., Macher, D., 2010. Students' expectations of, and experiences in e-learning: their relation to learning achievements and course satisfaction. Comput. Educ. 54, 222–229.
Porter, C.E., Donthu, N., 2006. Using the technology acceptance model to explain how attitudes determine Internet usage: the role of perceived access barriers and demographics. J. Bus. Res. 59 (9), 999–1007.
Raman, A., Don, Y., 2013. Preservice teachers' acceptance of learning management software: an Application of the UTAUT2 Model. Int. Educ. Stud. 6 (7), 157–160.
Rogers, E.M., 2003. Diffusion of Innovations, fifth ed. The Free Press, New York.
Saadé, R., Kira, D., 2006. The emotional state of technology acceptance. Informing Sci. Inform. Technol. 3, 529–539.
Sadaf, A., Newby, T.J., Ertmer, P.A., 2012. Exploring factors that predict preservice teachers' intentions to use web 2.0 technologies using decomposed theory of planned behavior. J. Res. Technol. Educ. 45 (2), 171e196.
San Martín, H., Herrero, _A., 2012. Influence of the user's psychological factors on the online purchase intention in rural tourism: integrating innovativeness to the UTAUT framework. Tour. Manag. 33 (2), 341e350.
Sang, G., Valcke, M., van Braak, J., Tondeur, J., 2010. Student teachers' thinking processes and ICT integration: predictors of prospective teaching behaviors with educational technology. Comput. Educ. 54, 103e112.

Schnotz, W., Lowe, R.K., 2008. A unified view of learning from animated and static graphics. In: Lowe, R., Schnotz, &W. (Eds.), Learning with Animation. Cambridge University Press, Cambridge, p. 304e356.
Sekaran, U., 2003. Research Methods for Business A Skill-Building Approach, fourth ed. John Wiley & Sons, New York.
Simon, H., 2006. Something from nothing. AdMedia 21 (1), 25–31.
Stebner, F., Kühl, T., Hoffler, T.N., Wirth, J., Ayres, P., 2017. The role of process information in narrations while learning with animations and static pictures. Comput. Educ. 104, 34–48.
Steers, R.M., Meyer, A.D., Snachez-Runde, C.J., 2008. National culture and the adoption of new technologies. J. World Bus. 23, 255–260.
Suki, N.M., Suki, N.M., 2013. Examining students' attitudes to the mobile phone as an educational tool. Educ. Res.: Challenges, Training Techniques and Improvements 33–45.
Suki, N.M., Suki, N.M., 2017. Determining students' behavioral intention to use animation and storytelling applying the UTAUT model: the moderating roles of gender and experience level. Int. J. Manag. Educ. 15, 528–538.
Tarhini, A., Masa'deh, R.E., Al-Busaidi, K.A., Mohammed, A.B., Maqableh, M., 2017. Factors influencing students' adoption of e-learning: a structural equation modeling approach. J. Int. Educ. 10 (2), 164–182.
Taylor, S., Todd, P.A., 1995. Understanding information technology usage: a test of competing models. Inf. Syst. Res. 6 (2), 144–176.
TechCrunch, 2016. Facebook climbs to 1.59 billion users and crushes Q4 estimates with $5.8B revenue. Retrieved 12 January 2017 from. https://techcrunch.com/2016/01/27/facebook-earnings-q4-2015/.
Thakur, R., Srivastava, M., 2015. A study on the impact of consumer risk perception and innovativeness on online shopping in India. Int. J. Retail Distrib. Manag. 43 (2), 148e166.
Thong, J.Y.L., Hong, S.-J., Tam, K.Y., 2006. The effects of post-adoption beliefs on the expectation-confirmation model for information technology continuance. Int. J. Hum. Comput. Stud. 64 (9), 799–810.
Tosuntas, S.B., Karadag, B.E., Orhan, S., 2015. The factors affecting acceptance and use of interactive whiteboard within the scope of FATIH project: a structural equation model based on the unified theory of acceptance and use of technology. Comput. Educ. 81 (2), 169–178.
Tversky, B., Bauer-Morrison, J., Bétrancourt, M., 2002. Animation: can it facilitate? Int. J. Hum. Comput. Stud. 57 (4), 247–262.
Venkatesh, V., Davis, F.D., Morris, M.G., 2007. Dead or alive? The development, trajectory and future of technology adoption research. J. AIS 8 (4), 268–286.
Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D., 2003. User acceptance of information technology: toward a unified view. MIS Q. 27 (3), 425–478.
Venkatesh, V., Thong, J.Y., Xu, X., 2012. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS Q. 36 (1), 157–178. /March 2012.
Wang, P.-Y., Vaughn, B.K., Lee, M., 2011. The impact of animation interactivity on novices' learning of introductory statistics. Comput. Educ. 56 (1), 300–311.
Yang, S., 2013. Understanding undergraduate students' adoption of mobile learning model: a perspective of the extended UTAUT2. J. Convergence Inf. Technol. 8 (10), 969–979.
Yi, M.Y., Fielder, K., Park, J., 2006. Understanding the role of individual innovations in the acceptance of it-based innovations: comparative analyses of models and measures. Decis. Sci. J. 37, 393–426.
Yuan, S., Ma, W., Kanthawala, S., Peng, W., 2015. Keep using my health apps: discover users' perception of health and fitness apps with the UTAUT2 model. Telemedicine e-Health 21 (9), 735–741.
Zhao, F., Scavarda, A.J., Waxin, M.-F., 2012. Key issues and challenges in e-government development: an integrative case study of the number one eCity in the Arab world. Inf. Technol. People 25 (4), 395–422.
Zuiderwijk, A., Janssen, M., Dwivedi, Y.K., 2015. Acceptance and Use Predictors of Open Data Technologies: Drawing upon the Unified Theory of Acceptance and Use of Technology. Government Information Quarterly.