

# DETERMINANTS OF ADOPTION OF MOBILE GAMES: EXTENDING UTAUT2 WITH TRUST AND REWARD

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## ABSTRACT

*This paper's goal is to investigate the variables influencing mobile gaming players' behavior intention based on the unified theory of acceptance and use of technology 2 (UTAUT2) model. The UTAUT2 model is expanded by adding variables, trust, and reward, in addition to the model's variables. The behavior intention to adopt mobile game is used and usage behavior is taken as the dependent variable. A survey is conducted and a sample of 474 mobile game players in Turkey is analyzed through structural equation modeling approach. The results indicate that reward has the most influential effect on behavior intention, followed by trust, price value, habit, social influence, performance expectancy, facilitating conditions, hedonic motivation, and effort expectancy. Besides, behavior intention has a significant positive effect on the usage behavior. The findings of the research fill the gap in existing literature on mobile games as well as provide valuable base for forthcoming research findings in mobile games.*

**Key Words:** mobile games, UTAUT2, acceptance of technology, technology adoption, usage behaviour

## Mobil Oyunların Benimsenmesinde Belirleyiciler: UTAUT2 Modelinin Güven ve Ödül İle Genişletilmesi

### ÖZET

*Bu makalenin amacı, birleşik kabul teorisi ve teknoloji kullanımı 2 (UTAUT2) modeline dayalı olarak mobil oyun oyuncularının davranış niyetini etkileyen değişkenleri araştırmaktır. UTAUT2 modeli, modelin değişkenlerine ek olarak, güven ve ödül değişkenleri eklenerek genişletilmiştir. Mobil oyunu benimseme niyeti kullanılmış, bağımlı değişken olarak ise kullanım davranışı alınmıştır. Türkiye'deki 474 mobil oyun oyuncusuna bir anket yapılmış ve veriler yapısal eşitlik modellemesi yaklaşımıyla analiz edilmiştir. Sonuçlar, ödülün davranış niyeti üzerinde en etkili etkiye sahip olduğunu, ardından güven, fiyat değeri, alışkanlık, sosyal etki, performans beklentisi, kolaylaştırıcı koşullar, hedonik motivasyon ve çaba beklentisi olduğunu göstermektedir. Ayrıca davranış niyeti, kullanım davranışı üzerinde anlamlı bir pozitif etkiye sahiptir. Araştırmanın bulguları, mobil oyunlara ilişkin mevcut literatürdeki boşluğu doldurmanın yanı sıra mobil oyunlara ilişkin ileride yapılacak araştırma bulguları için değerli bir temel oluşturmaktadır.*

**Anahtar Kelimeler:** mobil oyunlar, UTAUT2, teknolojinin kabulü, teknolojinin benimsenmesi, kullanım davranışı

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## **Introduction**

The use of mobile services has become widespread with the improvement of communication technologies and the internet. With the use of mobile technologies, people's lives have become easier. Since mobile devices consisting of products such as smart phones and tablets are ready for use anywhere and anytime, the use of these devices has increased day by day. While 3.66 billion people used smartphones in 2016, this number reached 6.25 billion people in 2021 and it is projected that 7.29 billion people will use smartphones in 2025 (Statista, 2022a). The expansion in the employ of smart phones and the development of internet technologies have increased the popularity of mobile applications. Mobile applications are software that can be installed on mobile devices from application stores such as Apple Store and Android Google Play. Mobile users may download mobile applications in areas such as games, music, and shopping from these stores with the assistance of the internet. As the efficiency and functionality of mobile devices enhances due to these mobile applications, more and more users are installing mobile applications on their mobile devices. The number of mobile application downloads in 2021, which increased more than 1.5 times compared to 2016, reached 230 billion (Statista, 2022b). The fact that new mobile applications are designed and the number of downloads increases every day has generated an appropriate atmosphere for the mobile game industry.

Mobile games have experienced great development since the first year they were developed and now they have begun to resemble traditional games. There are many reasons why mobile games are preferred when compared to other platform games such as personal computers and game consoles. One of the benefits of mobile games is that users can play wherever and whenever they want, without being bound by any time and place restrictions. Considerations such as ease of use of mobile devices, portability due to its small size, and decreasing cost day by day have made mobile games common in the choice of leisure interests (Bose & Yang, 2011). However, compared to other traditional games, it is not always convenient to play games in mobile devices because the screens of mobile devices where mobile games are played are smaller and the graphics cards and storage capacity are inadequate. At the same time, receiving many different notifications from mobile devices connected to the Internet can distract users who play mobile games.

The advancement of modern information technology and the upsurge in the figure of users using mobile devices have caused people who love to play games to be interested in mobile games. Mobile gaming has been a popular activity among all countries. The number of mobile game downloads, which was 100 billion in 2020, taking the largest share compared to other mobile application categories, is expected to reach 165 billion in 2025 (Statista, 2021a). Mobile game is one of the innovations that develops very rapidly and its profitability is constantly increasing (Liu & Li, 2011). Mobile game applications revenues, which were 90.7 billion dollars in 2021, increasing 1.5 times compared to the last two years, are expected to reach 116.4 billion dollars in 2024 (Statista, 2021b). When considering Turkey among the countries, it is one of the countries where the amount of mobile game players and mobile game revenues increase every year. The total number of players in Turkey rose from 36 million to 41 million and total mobile game revenue increased from 450 million dollars to 620 million dollars in 2021 (GamingInTurkey, 2021). Therefore, it is significant to examine mobile game adoption in a country where game player numbers and mobile game revenues are increasing every year.

Because of the rise in mobile game users and mobile game revenues in Turkey, this study examines the factors affecting behavioral intention in mobile game adoption. Earlier papers have studied the behavioral intentions for mobile games' adoption by employing the Technology Acceptance Model (TAM) (Ha et al., 2007; Gökalp, 2014; Kaltum et al., 2018;

Rafdinal et al., 2020), UTAUT (Zhou, 2013; Kumar & Acharjya, 2017) and UTAUT2 (Baabdullah, 2018; Baabdullah, 2020; Ramírez-Correa et al., 2019). However, in addition to a limited number of studies on mobile games' mobile player adoption, only one study has been conducted in Turkey using TAM (Gökalp, 2014). This study focuses on the UTAUT2 model that is put forward by Venkatesh et al. (2012). "Habit" (HBT), "social influence" (SOIN), "price value" (PRVA), "hedonic motivation" (HMO), "effort expectancy" (EFEX), "facilitating conditions" (FACO), "performance expectancy" (PEEX), "behavior intention" (BEIN) and "usage behavior" (USBE) factors are taken from the UTAUT2 model. Besides this research extends the UTAUT2 model by adding the two new independent variables, trust (TRU) and reward (REW). This research's purpose is to empirically identify the determinants having influence upon user's behavioral intention to play mobile games in Turkey. Because research on mobile games is lacking, the noteworthy objective of this study is to remove the vagueness in the literature. Structural equation modeling (SEM) was applied to evaluate the mightiness of relation of the variables in the model that is proposed on account of discovering factors that might affect the intentions of players in mobile games.

## **1. Literature Review**

### **1.1. Mobile Games**

Mobile games are video games that can be played after being installed on mobile devices. The design of mobile games has accelerated with the growth of the internet and mobile technologies. Since mobile devices are portable, users can play mobile games wherever they want. The touchscreens and the larger screen size offer gamers a better experience. Mobile games can be adapting existing games to mobile devices, newly created particularly for mobile devices, single player, or multiplayer (Liang & Yeh, 2011). While some mobile games require internet to play, some mobile games do not need any internet connection. Alzahrani et al. (2017) declares mobile games that require internet are divided into two categories as mobile games in playing individually and social network mobile games.

### **1.2. UTAUT2**

Researchers have created many models to clarify technology acceptance and use. Davis (1989) developed TAM which explains Information Technology (IT) acceptance by two primary factors, ease of use (convenient utilization) and perceived usefulness (beneficial utilization). Within TAM, behavior of using the technological systems of the individual is affected by BEIN, degree of ease of use felt by person, individual's attitude, and perceived usefulness experienced by the individual during the usage of the systems. The model, focusing on the relationships with issues related with the convenient utilization, beneficial utilization, individual's attitude, person's behavioral intention and actual utilization, explains the individual acceptance in information systems. However, the model has been criticized for not including the negative emotions and intrinsic motivations of consumers (Lu & Su, 2009).

Venkatesh et al. (2003) proposed the UTAUT model by integrating eight fundamental novelty adoption of theoretical frameworks, one of which is TAM. During employing a new product behavioral intention is explained seventy percent of variance by UTAUT, while scores for other models range from 17% to 53% (Ramírez-Correa et al., 2019). UTAUT model explains that EFEX and PEEX of the individuals, FACO and SOIN are significantly associated with BEIN to use information technology. Also, BEIN of the users and FACO as independent variable, influence individual's USBE in technology context. However, considering the rapid technological developments and the development of new products and services recently, it has

become necessary to explore different variables which motivate consumers to accept and use new technologies.

Venkatesh et al. (2012) presented the UTAUT2 model by adding up three new variables such as HBT, PRVA, and HEMO to the UTAUT model whose variables are associated with the utilitarian value. Venkatesh et al. (2012) also indicated the recent three factors could enhance the limits of theoretical knowledge of UTAUT2. The new modified model UTAUT2 was tested experimentally and claimed to have a greater percentage of variance than UTAUT (Cheng et al., 2020).

### **2.3. Mobile Game Adoption**

Several studies analyzed determinants that affect intention of customer to use mobile games (Gökalp, 2014; Kumar & Acharjya, 2017; Baabdullah, 2018; Kaltum et al., 2018; Ramírez-Correa et al., 2019; Baabdullah, 2020; Rafdinal et al., 2020). Within the context of Turkey, Gökalp (2014) used TAM to explore the determinants influencing the usage and mobile games' acceptance. By using structural equation modeling Gökalp (2014) reported that perceived convenience, perceived enjoyment, flow experience, and use context impacts the BEIN of customers to use mobile games. Kaltum et al. (2018) found the main factors that encourage Indonesian smart phone users to play mobile games employing TAM. After doing a survey on Indonesian mobile game users in the age range of 18–25 and analyzing the data statistically, they found that attitude, perceived ease of use, flow, and accessibility affect BEIN in mobile games.

Kumar and Acharjya (2017) proposed and empirically tested UTAUT model to decide the determinants of behavior intention in mobile games. After analyzing the online survey data, they applied to 263 people with the structural equation model, Kumar and Acharjya (2017) concluded that facilitating condition, satisfaction of the game and game system quality significantly affect BEIN in mobile games.

Drawing on the UTAUT2 model, Baabdullah (2018) identified the main factors impacting on the behavioral intention in order to use mobile social network games. Baabdullah (2018) applied a survey to collect data from 386 Saudi potential users who are from three Saudi Arabian cities. Baabdullah (2018) used Structural Equation Modelling for analyzing data and he found that all UTAUT2 model independent variables except habit and trust impacted behavioral intention positively to use mobile games. Ramírez-Correa et al. (2019) analyzed the users acceptance of online games in their mobile devices, based on UTAUT2 within the context of Spain. They declared SOIN, HEMO, and HBT have an association with the playing online games' intention. Baabdullah (2020) investigated variables that impact the adoption of social network games in mobile by UTAUT2. After obtaining 355 usable questionnaires in Saudi Arabia, Baabdullah (2020) found that UTAUT2's independent factors and additionally awareness factor as independent factor has positive impact on behavioral intention.

## **2. Conceptual Model**

The UTAUT2 model, which was developed by adding three variables to the UTAUT model, which consists of four variables, better predictive validity within the scope of technological products and services (Venkatesh et al., 2012). Figure 1 demonstrates the research model implemented in this study based on UTAUT2. The research model aims to explain the acceptance of mobile games in Turkey. Figure 1 indicates that PEEEX, EFEX, SOIN, FACO, HEMO, PRVA, HBT and TRU as independent factors of UTAUT2 model affects BEIN and BEIN of the customers influences the use behavior. Additionally, this study has extended the UTAUT2 model by adding two independent variables, TRU and REW.

### **2.1. Performance Expectancy (PEEX)**

PEEX is defined as benefiting the user or increasing individual's work-related performance when person uses the technology (Venkatesh et al., 2003). PEEX is like the perceived usefulness (PEUS) variable used in the TAM model. Kaltum et al. (2018) and Rafdinal et al. (2020) found that PEUS impacts attitude in mobile games by using TAM. Park et al. (2014), Lee et al. (2018) found that behavior intention will be influenced towards using mobile social network games through the perceived usefulness. Baabdullah (2018) and Baabdullah (2020) used UTAUT2 model and found that PEEX influenced BEIN in social network games. Consequently, study hypothesizes the following:

H1: PEEX directly and positively affects the BEIN in the mobile games.

### **2.2. Effort Expectancy (EFEX)**

Venkatesh et al. (2003) described EFEX as the degree of simplicity a user realises and feels while using the technological system There is a resemblance between EFEX variable in UTAUT2, and the perceived ease of use variable in TAM. When players feel easy to use a particular mobile game and put little effort into it, their behavioral intentions will rise (Chen & Kuan, 2012). Ha et al. (2007) and Rafdinal et al. (2020) found that EFEX had positive impact on attitude in the perspective of the mobile game by using TAM. Liang and Yeh (2011) proposed a research model that strengthens existing theories of technology adoption and observed that ease of use strongly impacts BEIN in the mobile games. The positive relationship between EFEX and BEIN in the mobile games was examined and validated in a previous studies (Baabdullah, 2018; Baabdullah, 2020). Therefore, study offers the following hypthosis:

H2: EFEX directly and positively affects the BEIN in the mobile games.

### **2.3. Social Influence (SOIN)**

SOIN is formed according to the importance that people close to the user give to technological systems (Venkatesh et al. 2003). If a person assumes that his behavior will be accepted by his social environment, then the intention of a particular behavior is more likely to occur (Ajzen, 1991). Ramírez-Correa et al. (2019) developed a model based on the original UTAUT2 and found that SOIN has a high association with the using online games' intention in mobile devices. Zhou (2013) drew on the flow theory to identify the factors of user adoption in mobile games and concluded that SOIN affects BEIN. In the research of Baabdullah (2018) and Baabdullah (2020), it is stated that SOIN is effective in BEIN of Saudi Arabian society in the context of mobile games. Based on this theoretical review, it can be proposed that:

H3: SOIN directly and positively affects the BEIN in the mobile games.

### **2.4. Facilitating Conditions (FACO)**

FACO are referred to as the degree of systematic support for the individual to feel comfier in using technological systems (Venkatesh et al. 2003). The FACO are related with the perceived behavioral control constructs in the theory of planned behavior which is proposed by Ajzen (1991). FACO indicate the impact of the resources (memory of mobile devices and internet connection) and information required for mobile game play on mobile devices. Kumar and Acharjya (2017) revealed that FACO have an influence on BEIN in the mobile games. In the research of Baabdullah (2018) and Baabdullah (2020), it is stated that FACO affect BEIN in mobile social network games. It was developed in line with these researches, hypothesis is listed as below:

H4: FACO directly and positively affects the BEIN in the mobile games.

## **2.5. Hedonic Motivation (HEMO)**

HEMO are referred to as the delight one gains while using technology. (Venkatesh et al. 2012). Earlier studies assessed the positive affect of perceived enjoyment of game player on mobile game adoption (Liang & Yeh, 2011; Ha et al., 2007). In Turkey, also it was discovered that perceived amusement impacts on BEIN to use mobile games (Gökalp, 2014). HEMO is studied as an important determinant of user's buying intention in perspective of mobile games (Lee et al., 2018) and mobile social network games (Baabdullah, 2018; Baabdullah, 2020). The H5 hypothesis developed in line with these researches are listed below:

H5: HEMO directly and positively affects the BEIN in the mobile games.

## **2.6. Price Value (PRVA)**

PRVA refers to "the consumer's cognitive arrangement between the perceived gains, and their monetary cost" (Dodds et al., 1991). The player will either adopt or abandon the mobile game based on his comparison. Within the context of mobile social network games, Baabdullah (2018) and Baabdullah (2020) indicates that PRVA is the important factor that impacts behavior intentions of customer to use mobile games. Thus, it is hypothesized:

H6: PRVA directly and positively affects the BEIN in the mobile games.

## **2.7. Habit (HBT)**

HBT is defined as behaviors that the person demonstrates again as a result of past knowledge (Venkatesh et al. 2012). HBT was found to positively influence BEIN and use behavior (Venkatesh et al. 2012). When using UTAUT2 framework, HBT is vital predictor of BEIN in mobile banking (Kwateng et al., 2018) and other mobile applications (Hew et al., 2015; Palau-Saumell et al., 2019). Ramírez-Correa et al. (2015) declares HBT and BEIN relationships within the context of online games in mobile devices. Based on a limited number of studies conducted within the mobile games, study derives the following hypothesis:

H7: HBT directly and positively affects the BEIN in the mobile games.

## **2.8. Trust (TRU)**

TRU is related with the truthfulness, benevolence, and the competence of another party (Doney et al., 1998). TRU has been investigated and proven to be an important variable that affects behaviour intention toward mobile banking (Alalwan et al., 2017) and a mobile shopping (Marriott & Williams, 2018). Alalwan et al. (2017) reached the relevant conclusions by extending the UTAUT2 model. Baabdullah (2018) found that TRU impacts BEIN of the Saudi mobile gamers by extending UTAUT2 model. Based upon the positive effect of TRU on BEIN in many different mobile applications, it can be proposed that TRU can have an effect on BEIN when using mobile games. From this point of view, H8 hypothesis have been developed as follows:

H8: TRU directly and positively affects the BEIN in the mobile games.

## **2.9. Reward (REW)**

The REW is defined as the winnings earned or experienced during using a mobile game. As players progress through the many mobile games they play, they receive higher virtual gifts such as virtual money, points in the game and goods (Hsiao & Chen, 2016). Philips et al. (2018) found that the REW in games increased the player's attendance, interest, and activity level. Besides, achievements increase motivation and performance in games if designed properly (Groening & Binnewies, 2019). In the research of Hsiao and Chen (2016), it is stated that REW

affect purchase of in-app behavioral intention in the mobile games. Thus, the hypothesis is made as follows:

H9: REW directly and positively affects the BEIN in the mobile games.

### 2.10. Behavior Intention (BEIN)

BEIN has a powerful role in influencing the actual use and new systems' adoption (Adjen, 1991). In the studies conducted within the scope of the UTAUT2 model, it was concluded that the BEIN affects the usage behavior in mobile banking (Alalwan et al., 2017) and mobile application for restaurants (Palau-Saumell et al., 2019). Present research proves that BEIN is a strong determinant of usage behavior within the context of online games on mobile devices by using UTAUT 2 model (Ramírez-Correa et al., 2019). The relationship mentioned above is specified in the following hypothesis:

H10: BEIN directly and positively affects the usage behavior in the mobile games.

Based upon the hypotheses developed, the proposed model that predicts mobile games adoption is illustrated in Figure 1.

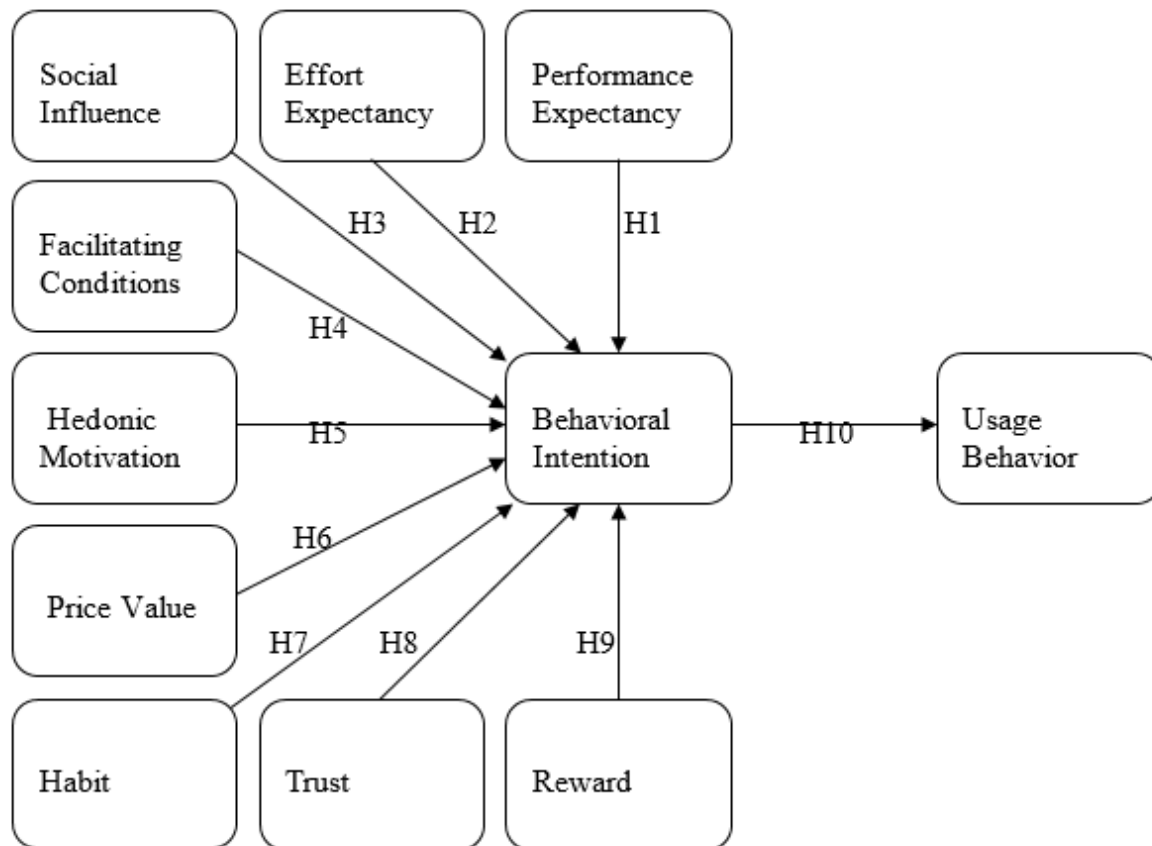


Figure 1. Conceptual Model

## 3. Research Method

### 3.1. Sample and Data Collection

The population of the research consists of individuals living in Turkey and having mobile devices. Due to restrictions on time, money, and resource, sample of this study was selected using a convenience sampling technique. Data was collected through a survey among mobile game players. Data collection began on June 25, 2022, and ended on July 10, 2022, and

participation was entirely voluntary. In total, 500 respondents participated. After incomplete responses and duplicates were eliminated, 474 usable questionnaires were obtained. Kline (2011) stated in their research that proportion of a sample size to the parameters' number must be minimum 10:1 to meet minimal sample criteria. Besides, Kline (2005) recommended a sample size of more than 300 individuals. The final sample size used in the study was 474 which is above minimum threshold suggested by research.

Sample' analysis reveals that 65.19% of the respondents were male and 34.81% of the participants were female. Most respondents were between 18 and 29 years of age, 41.98%. The remaining groups of the sample, 31.43% were 30–39 years old, 19.20% were aged 40-49, and 7.38% were over 50 years. Play time per day showed that the largest percentage accounted for 30.80% with 0.5 hour to 1 hour. Players playing less than 0.5 hour made up 26.16%, those who play between 1 hour to 2 hours made up 27.22%, and those playing over 2 hours per day accounted for 15.82%. Mobile game players who use Android as mobile game platform made up 71.31% of the sample, while those using iOS made up 28.69%. 81.43% of the sample used the mobile phone to play mobile games, and 18.57% used a tablet.

The research data were collected with the permission of the Presidency of the Ethics Committee of Ankara Science University with the decision numbered "2022/06" and dated 24.06.2022.

### **3.2. Measures**

The questionnaire benefitted in the research consisted of demographic profile of the participants and construct items. Based upon the proposed research model, with the 7-point Likert scale, 11 initial variables are measured by 41 items. UTAUT2 model-based constructs HBT, PRVA, HEMO, EFEX, PEEEX, FACO, SOIN, and BEIN were measured using the scale which is proposed by Venkatesh et al. (2012). Measurement items for TRU were adapted from Gefen et al. (2003). Items for REW were adapted from Yi and Jeon (2003). Items for USBE were adopted from study by Kwon and Wen (2010).

### **3.3. Data Analysis**

SEM was employed as a tool for testing the proposed general model presented in Figure 1. The analysis of the data obtained from the research was done through SPSS 26 and AMOS 24 programs. Before conducting SEM analysis, the measurement model was tested for validity and reliability.

### **4. Results**

Decision of the normality for all the variables was examined using the kurtosis and skewness values (KUANDSK). It was observed that the KUANDSK of all the variables were below their cut-off point recommended by Kline (2011) which reveals the variables in the study supplies the univariate normal distribution.

To discover common method bias, study implemented post hoc Harman's one factor analysis to check whether variance in the data can be largely attributed to a single factor (Podsakoff et al., 2003). An unrotated principle component factor analysis was carried out for all variables. The results disclosed that eigenvalues of 11 factors was greater than one. The first factor accounted for 22.02% of covariance among the measures at maximum. The other nine factors explained the variance between 3.21% and 10.56%. Further, common latent factor test indicates that the differences in the factor loading of the items on the underlying latent construct is not more than 0.2 (Podsakoff et al., 2003). Thus, no obvious common method bias was detected. After examining the normality and common method bias, the two phases recommended in the study of Anderson and Gerbing (1988) will be implemented.



#### 4.1. Measurement Model

Several fit indicators such as CMIN/DF, GFI, AGFI, CFI, NFI, TLI, RMSEA are assessed to measure how well the model of the study fits the data. The findings reveal the study's model fit is satisfactory: (CMIN/DF=1.443, DF=724,  $p=0.000$ ), GFI=0.904, AGFI=0.886, CFI=0.978, NFI=0.932, TLI=0.975, RMSEA=0.031. All indices could provide stated value of threshold, suggested by Bagozzi and Yi (1988), Hair et al. (2010).

By inspecting standardized regression weights (factor loading) in Table 1, all items were observed to have a factor loading greater than 0.5 and items were significant in  $p < 0.0001$  statistically (Hair et al., 2010). Similarly, AVE values of PEEEX, EFEX, SOIN, FACO, HEMO, PRVA, HBT, TRU, REW, BEIN and USBE variables are shown in Table 1, showing all the values are greater than recommended value of 0.50 (Hair et al., 2010). Table 2 describes factor correlation coefficients and diagonal values in bold show square root value of AVE for PEEEX, EFEX, SOIN, FACO, HEMO, PRVA, HBT, TRU, REW, BEIN and USBE constructs. It can be observed that all of the inter-construct's value of correlations are less than the square roots of AVE for the corresponding factors (Fornell & Larcker, 1981). Thus, study finalizes that the convergent and discriminant validity of each of the construct measures are accomplished.

**Table 1:** Results of Measurement Model

Constructs	Items	Loadings	AVE	Composite Reliability	Cronbach's Alpha
Performance Expectancy	PEX1	0.851	0.849	0.957	0.956
	PEX2	0.969			
	PEX3	0.963			
	PEX4	0.899			
Effort Expectancy	EEX1	0.537	0.604	0.856	0.847
	EEX2	0.832			
	EEX3	0.870			
	EEX4	0.826			
Social Influence	SIN1	0.730	0.659	0.852	0.851
	SIN2	0.853			
	SIN3	0.848			
Facilitating Conditions	FCO1	0.711	0.628	0.870	0.865
	FCO2	0.904			
	FCO3	0.830			
	FCO4	0.709			
Hedonic Motivations	HMO1	0.812	0.803	0.924	0.922
	HMO2	0.936			
	HMO3	0.936			
Price Value	PVA1	0.704	0.551	0.786	0.786
	PVA2	0.755			
	PVA3	0.767			
Habit	HBT1	0.866	0.804	0.942	0.941
	HBT2	0.952			
	HBT3	0.933			
	HBT4	0.832			
Trust	TRU1	0.702	0.570	0.902	0.900
	TRU2	0.861			

	TRU3	0.814			
	TRU4	0.748			
	TRU5	0.759			
	TRU6	0.680			
	TRU7	0.708			
	REW1	0.814			
Reward	REW2	0.954	0.785	0.916	0.910
	REW3	0.885			
Behavioral Intention	BIN1	0.883			
	BIN2	0.946	0.855	0.946	0.945
	BIN3	0.944			
Usage Behavior	USE1	0.841			
	USE2	0.950	0.831	0.936	0.933
	USE3	0.940			

**Table 2:** Correlation Matrix

	PEEX	EFEX	SOIN	FACO	HEMO	PRVA	HAB	TRU	REW	BEIN	USBE
PEEX	<b>0.921</b>										
EFEX	0.134	<b>0.777</b>									
SOIN	0.197	0.205	<b>0.811</b>								
FACO	0.153	0.228	0.272	<b>0.792</b>							
HEMO	0.060	0.111	0.044	0.065	<b>0.896</b>						
PRVA	0.194	0.208	0.183	0.190	0.167	<b>0.742</b>					
HAB	0.034	0.062	0.157	0.114	-0.008	0.118	<b>0.896</b>				
TRU	0.212	0.179	0.184	0.230	0.096	0.161	0.107	<b>0.754</b>			
REW	0.143	0.117	0.055	0.147	0.038	0.109	0.398	0.135	<b>0.886</b>		
BEIN	0.311	0.275	0.340	0.336	0.202	0.365	0.329	0.364	0.381	<b>0.924</b>	
USBE	0.215	0.208	0.176	0.190	0.042	0.147	0.491	0.252	0.528	0.588	<b>0.911</b>

All variables were examined to confirm an acceptable level of reliability using both composite reliability values (CRV) and Cronbach’s alpha values (CAV). As displayed in Table 1, CRV and CAV of PEEEX, EFEX, SOIN, FACO, HEMO, PRVA, HBT, TRU, REW, BEIN and USBE constructs have above the cut-off point of 0.70 (Bagozzi & Edwards, 1998; Hair et al., 2010). Thus, all the constructs in the study signified adequate reliability.

#### 4.2. Structural Model and Hypothesis Testing

The structural model’s goodness of fit is evaluated with the similar conditions as used in measurement model. All indices estimated are within their recommended values (CMIN/DF=1.591 p=0.000, AGFI=0.878, CFI=0.970, NFI=0.924, TLI=0.967, RMSEA=0.035). Therefore, the structural model presents a good fit of the data.

According to Table 3 showing the results of the path coefficients, PEEEX ( $\beta_{PEEX-BEIN} = 0.136, p < 0.001$ ), EFEX ( $\beta_{EFEX-BEIN} = 0.082, p < 0.05$ ), SOIN ( $\beta_{SOIN-BEIN} = 0.154, p < 0.001$ ), FACO ( $\beta_{FACO-BEIN} = 0.121, p < 0.01$ ), HEMO ( $\beta_{HEMO-BEIN} = 0.113, p < 0.01$ ), PRVA ( $\beta_{PRVA-BEIN} = 0.176, p < 0.001$ ), HBT ( $\beta_{HBT-BEIN} = 0.166, p < 0.001$ ), TRU ( $\beta_{TRU-BEIN} = 0.179, p < 0.001$ ), REW ( $\beta_{REW-BEIN} = 0.224, p < 0.001$ ) were found to be significant in explaining BEIN. Besides, BEIN ( $\beta_{BEIN-USBE} = 0.597, p < 0.001$ ) impacted USBE. Therefore, all research hypotheses H1-H10 are all supported.

**Table 3:** Standardized Estimates of the Structural Model

Hypotheses	Relationships	Path	t-values	p-values	Result
H1	PEEX -> BEIN	0.136	3.450	0.000	Supported
H2	EFEX -> BEIN	0.082	1.965	0.049	Supported
H3	SOIN -> BEIN	0.154	3.548	0.000	Supported
H4	FACO -> BEIN	0.121	2.846	0.004	Supported
H5	HEMO -> BEIN	0.113	2.945	0.003	Supported
H6	PRVA -> BEIN	0.176	3.890	0.000	Supported
H7	HBT -> BEIN	0.166	3.976	0.000	Supported
H8	TRU -> BEIN	0.179	4.288	0.000	Supported
H9	REW -> BEIN	0.224	5.216	0.000	Supported
H10	BEIN -> USBE	0.597	13.118	0.000	Supported

## 5. Discussion

The aim of this study is to examine the determinants of adoption of mobile games and thus to analyze the acceptance of mobile games, based on the UTAUT2 model. The study extends the UTAUT2 model with TRU and REW constructs to investigate the factors that affect the consumers' BEIN on mobile games. Moreover, the study examines the relationship between BEIN and USBE. The results show the good measurement and structural model and support all ten hypotheses.

With respect to the PEEX-BEIN path coefficient analysis, PEEX has a positive effect on BEIN. Players who think mobile games are useful and beneficial, have a higher BEIN to adopt mobile games. Result indicates if mobile games improve the game player's performance, it will create intention for the players. The results about PEEX-BEIN link are consistent with the work of Baabdullah (2018) and Baabdullah (2020) within the context of mobile games.

The relation between the EFEX and BEIN was significant and positive and thus the second hypothesis regarding EFEX-BEIN link of the study was supported. The results of EFEX-BEIN association are in accordance with the work of Ha et al. (2007) and Rafdinal et al. (2020). This indicates that if the understanding how to use mobile games is simple and interaction with mobile games is strong, it will create BEIN and results in USBE on mobile games. When players perceive that using mobile games does not require too much hard work, they will be more likely to adopt mobile games.

The findings also suggest that SOIN impacts on BEIN positively. The relationship between the SOIN and BEIN within the context of mobile games is consistent with the past literature (Zhou, 2013; Baabdullah, 2018; Baabdullah, 2020). Finding indicates that behavior intention of the gamers is influenced by the people who are crucial to the gamer and people who control gamer's behavior. Recommendations and suggestions of the people that gamers care about increases the gamer's behavior intention.

FACO is also another antecedent of behavior intention in mobile games. Such result relating to the role of FACO was consistent with other study (Kumar & Acharjya, 2017). Gamer values the availability of resources, skills, facilities, and assistance necessary to use the mobile game. If they have resources, technical support, and information about the mobile games, they will be more likely to adopt mobile games. The studies which support facilitating condition and behavior intention relationship include Huang et al. (2014) in mobile cloud games and Park et al. (2014) in the mobile social network games.

The path between the HEMO and BEIN was significant and positive. The results regarding HEMO-BEIN are in accordance with the studies of Gökalp (2014) Lee et al. (2018). The result about this relationship implies that if the mobile game is fun, enjoyable, and entertaining it will increase user's engagement. When users have a feeling of pleasure, they will be more likely to have higher intention in mobile games.

PRVA-BEIN relationship is supported by the studies of Baabdullah (2018) and Baabdullah (2020). If the user thinks that mobile game is reasonably priced, this will give rise to establishment of BEIN. The result also indicates that if an individual thinks mobile game is good value for the money, this will result in the mobile game acceptance.

Regarding the HBT - BEIN path, this path is accepted. The studies which also support our results include Ramírez-Correa et al. (2015) and Hew et al. (2015). The result implies that when the use of mobile games has become a habit to the user, this will result in the creation of intention. If the individuals consider that using mobile games becomes natural for them, they will opt for this mobile game. Habits towards mobile gaming play a significant role in enhancing their BEIN towards mobile gaming.

TRU also has a significant impact over the BEIN of the players. This finding is in sync with results of previous studies on mobile games, mobile shopping, and mobile banking (Baabdullah, 2018; Marriott & Williams, 2018; Alalwan et al., 2017). If the individual thinks that mobile game is honest and trustworthy, this will result in the creation of BEIN. When people or organizations that offer the mobile game are not opportunistic, care about their customers, and provide a good service and experience to the customer, this will lead to increase mobile game player's engagement. People are more willing to adopt a mobile game when there is trust in the mobile game's provider.

H9 is also supported and shows a significant REW – BEIN relationship. The finding that REW has a significant impact on BEIN is in harmony with the findings of Hsiao and Chen (2016). The reward provided in the mobile games rises the behavioral intention of the players.

Behavioral intention is also approved to have a meaningful effect on the usage behavior to adopt mobile games. By a similar argument, study in the context of online games in mobile devices has suggested relationship between the BEIN and the USBE (Ramírez-Correa et al., 2019). The result indicates that behavioral intention brings about the usage of technology in mobile games.

## **6. Implications, Limitations and Future Scope of Work**

### **6.1. Implications**

From a theoretical perspective, this research assessed the user adoption of mobile games using UTAUT2 model. Earlier studies mostly focused on proposing and testing the relationship between determinants and the behavior intention on mobile banking (Alalwan et al., 2017; Kwateng et al., 2018) and mobile application for restaurants (Palau-Saumell et al., 2019) by using UTAUT2 model. However, the user adoption of mobile games using UTAUT2 model has rarely been investigated. This research attempts to fill the gap. Besides, to extend the UTAUT2 model, another two new variable constructs, trust and reward, has been used to examine its impact on behavior intention. Two new variable trust and reward positively influence behavior intention of mobile game player. Thus, this study developed the UTAUT2 application to be implemented in Turkey by adding two new variables on the context of mobile game, which is rarely studied in the literature. Lastly, this study contributes to the limited literature on figuring out the adoption and usage behavior of mobile games players.

From a managerial perspective, this study proves that reward, trust, and price value are the top three important predictors of behavioral intention in mobile games. This indicates that mobile game providers should offer rewards such as play bonuses or top score rewards. Mobile games providers must focus on providing greater perceived value and benefit in saving money by creating opportunities, such as offering extra discounts on mobile game downloads. They also provide certainty, honesty, trustworthy, safety in their mobile games. Mobile games providers should conduct training courses and user-friendly instructions about mobile games for players to learn how to use games easily. Mobile games should be designed to increase the interest, pleasure, and excitement of players. The mobile games providers must also focus on designing their game's content fascinating, for instance, by presenting daily game duties according to the player status. Mobile games providers could employ word of mouth impact to enhance mobile games' player adoption. To create a social influence, attention-grabbing videos about the mobile game should be posted on social media such as Tumblr, Instagram, Twitter, YouTube, Facebook, and Pinterest.

## 6.2. Limitations and Future Scope of Work

The main limitation of this study is that it was conducted only one country, Turkey. Future researchers could test proposed model across different countries. Study extended UTAUT2 model by adding reward and trust variables. Further research may consider other contextual related variables such as personalization or perceived risk, that may impact player's behavior intention.

### Information Note

The article has been prepared in accordance with research and publication ethics. The research data were collected with the permission of the Presidency of the Ethics Committee of Ankara Science University with the decision numbered 2022/06 and dated 24.06.2022.

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