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Exploring the behavior of online fitness users by using the Unified Theory of Acceptance and Use of Technology

Exploración del comportamiento de los usuarios de fitness en línea mediante el uso de la Teoría Unificada de Aceptación y Uso de Tecnología

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ABSTRACT

The aim of this study was to explore the behavior of online fitness users by using an integrated technology acceptance model. We also discussed the significant impact of fitness live streaming users on the integrated technology acceptance model. A cross-sectional study was carried out on a sample of 150 users who used Facebook fitness live streaming platform to watch fitness live streaming videos and used the live message reply, like and tracking functions. The Unified Theory of Acceptance and Use of Technology (UTAUT) model was utilized to examine the behavior of users of Facebook fitness live streaming platform. The results showed that there are statistically significant impacts in each structure of UTAUT, and the users of fitness live streaming have positive effects in UTAUT. In addition, the convenience and the infinity of Internet allows the social media users to

obtain effective information through fast and real-time communication media and most users have the resources and knowledge required for live streaming.

KEYWORDS

Facebook; UTAUT; Live streaming; Fitness

RESUMEN

El objetivo de este estudio fue explorar el comportamiento de los usuarios de fitness en línea mediante el uso de un modelo integrado de aceptación de tecnología. También discutimos el impacto significativo de los usuarios de transmisión en vivo de fitness en el modelo integrado de aceptación de tecnología. Se llevó a cabo un estudio transversal en una muestra de 150 usuarios que usaron la plataforma de transmisión en vivo de fitness de Facebook para ver videos de transmisión en vivo de fitness y usaron las funciones de respuesta de mensajes en vivo, me gusta y seguimiento. El modelo de Teoría Unificada de Aceptación y Uso de Tecnología (UTAUT) se utilizó para examinar el comportamiento de los usuarios de la plataforma de transmisión en vivo de fitness de Facebook. Los resultados mostraron que hay impactos estadísticamente significativos en cada estructura de UTAUT, y los usuarios de transmisión en vivo de fitness tienen efectos positivos en UTAUT. Además, la conveniencia y la infinidad de Internet permite a los usuarios de las redes sociales obtener información efectiva a través de medios de comunicación rápidos y en tiempo real y la mayoría de los usuarios tienen los recursos y conocimientos necesarios para la transmisión en vivo.

PALABRAS CLAVE

Facebook; UTAUT; Transmisión en vivo; Condición física

1. INTRODUCTION

Compared to traditional TV broadcasting, social media has become ubiquitous (Kelly, Keaten & Millette, 2020) and live streaming has become real-time and unpredictable, and can even bring more interactive experience and presence to the viewers. Live streaming is ubiquitous in many apps, and has become a major phenomenon (Brouwer, 2015). According to a survey conducted by the Institute for Information Industry (III), Facebook, one of the most popular social networks (Amichai-Hamburger & Vinitzky 2010), has become a very important live broadcasting platform after live streaming became popular. Another survey conducted by the Institute for Information Industry (2017), showed that since the popularity of online live streaming, among various online live

streaming platforms and programs, Facebook is the most popular online live streaming platform in Taiwan and the most popular types of programs include food tourism, entertaining content, sports fitness, make-up lessons, etc. Due to the wide range of age groups and the highly shared characteristics of Facebook, Facebook webcasting not only changes the communication between people but also enhances the speed and efficiency of social learning through the Internet. The use of Facebook for entertainment was the strongest in predicting the intensity (Alhabash, Chiang & Huang, 2014). Webcasting has become another new way of teaching fitness. Without being limited by space and time, the audience not only watch the programs for their own needs, but have even found out that watching other's sport performances is relaxing. The level of interest that social platform users can perceive is the degree to which individuals focus their attention on interacting online. Lin & Tsai (2002) pointed out that 88% of 753 Taiwanese high school students were Internet addicted users. Internet users are curious during interaction and find out that the nature of this interaction is enjoyable and interesting (Moon & Kim, 2001; Ahn, Ryu & Han, 2007), Some introverts and neurotic individuals locate their "true self" on the Internet (Amichai-Hamburger, Wainapel & Fox, 2002).

Online fitness classes were initially presented in streaming media such as YouTube, Cody, Grokker, and Fitness Blender, etc. Video and audio communication have changed the ways of filming and consuming (Gannes, 2009). Under the rapid development of technology, the online fitness teaching pattern has gradually changed (Stragier, Abeele, Mechant & De Marez, 2016). In many researches on new-type network behaviors, the integrated technology acceptance model (UTAUT) has been widely used for network platforms and technology devices. Since UTAUT is a combination of the last eight theoretical models, the explanatory power of technology adoption is up to 70% (Venkatesh et al., 2003). Terzis & Economides (2011) used the integrated technology acceptance model to examine the acceptance behavior of computer systems. The aim of the present study is to explore the behavior of online fitness users using an integrated technology acceptance model that does not include adjustment variables, and also to discuss the significant impact of fitness live streaming users on the integrated technology acceptance model.

2. LITERATURE REVIEW

Online live streaming is a live broadcast mode of video, through live streaming of audio and video, via the Internet. The terminal will instantly transmit the video to everyone on the network. Since the audience watch the real-time live streaming, the video has no longer needed to be recorded

in advance therefore, the characteristics of online live streaming are real-time, time-limited, and the presence of the audience as if they were there in person (Brouwer, 2015).

Regardless of the live streaming platform or method, the host of the live streaming channel, also known as live streamers, can talk directly to the audience during live video streaming through the chat function, which further improves the interactive and social nature of live streaming (Chen, 2016).

Content and types of live streaming include live video games, product sales, sports events, online classes, etc. Among them, the most popular live streaming platforms include YouTube, Twitch, LIVEhouse in, etc (Lai & Chang, 2016). In addition, Market Intelligence & Consulting Institute (MIC) (2017) found that the most preferred live streaming platform for netizens is the Facebook social platform (71.6%), followed by YouTube (55.2%), 17 live streaming (19.5%), Instagram (15.6%), Live. Me (10.2%), etc. With the development of social networking, more and more people have used social networking sites, and even consider them as an inevitable daily activity.

However, among many social networking sites, Facebook, founded by Mark Elliot Zuckerberg and others in 2004, is one of the largest, most extensive, and most widely used community sites. A survey of college students at several universities in Midwest of the United States found that as many as 91% of respondents have used Facebook (Wiley & Sisson, 2006). In 2017, Mark Zuckerberg announced that the number of Facebook users has reached 2 billion, which is almost a quarter of the world's population. This shows that Facebook has penetrated into the daily lives of many people.

Since the launch of Facebook, the functions and technology of its platform have been continuously improved, from the basic function of leaving messages, uploading photos and videos, and other functions to a major revision in 2011 that introduced dynamic time, video calling and other functions (Huang, Tsou & Lin, 2014). Facebook has focused on "video" since 2014, and began live streaming some celebrities, including Jushi Johnson. Later, Facebook started to promote its live videos globally and has new features, such as likes for favorite videos and participation in discussions and reactions during live streaming in 2016 (Seetharaman & Deepa, 2017). Therefore, this research conducted by platform users who used the Facebook live platform for message reply, like and express their emotions, tracking and watching.

3. METHODS

3.1. Participants and design

This cross-sectional study was carried out on a sample of 150 users who used Facebook fitness live streaming platform to watch fitness live streaming videos and use the live message reply, like, and tracking functions. A convenient sampling method was used for the survey and a total of 150 valid questionnaires were administered through the online questionnaire to 150 users of the Facebook fitness live streaming platform. The UTAUT model was utilized to examine the behavior of users of Facebook fitness live streaming platform.

3.2. Data analysis

Smart PLS 2.0 was used to verify the Unified Theory of Acceptance and Use of Technology by Venkatesh et al. (2003), including Confirmatory Factor Analysis (CFA) and Structural Equation Model (SEM).

3.3. Research Framework

The study utilized the UTAUT model as theoretical framework for the research (Figure 1).

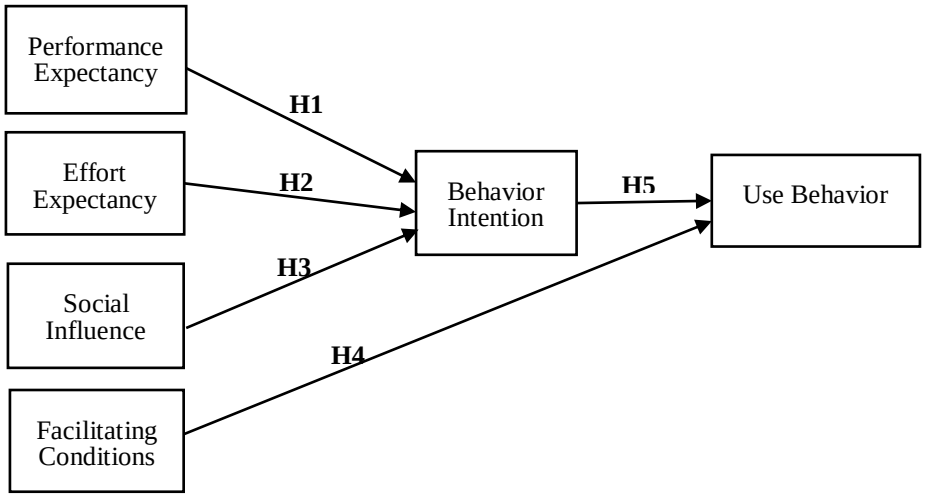

Figure 1. Research Framework Model

There were five hypotheses (H) of research:

H1: The performance expectancy of fitness live streaming users has a significant effect on behavioral intentions.

H2: The effort expectancy of fitness live streaming users has a significant effect on behavioral intentions.

H3: The social influence of fitness live streaming users has a significant effect on behavioral intentions.

H4: The facilitating conditions of the fitness live streaming users have a significant effect on the actual use behavior.

H5: The behavior intention of the fitness live streaming users has a significant effect on use behavior.

4. RESULTS

4.1. Sample description

The sample description is presented in Table 1. Male students number participating in the study was higher (n=91) than female (n=59). Of all participants, 47.3% (n=71) were 21-30 years old, 46.0% (n=69) had less than 3 months of use experience, and 80.7% (n=121) were individual volunteers (Table 1).

Table 1. Results of sample description

Item		Number of People	Percentage
Sex	Male	91	60.7%
	Female	59	39.3%
Age	Under 20 years old	21	14.0%
	21~30 years old	71	47.3%
	31~40 years old	25	16.7%
	41~50 years old	27	18.0%
	Over 50 years old	6	4.00%
Use Experience	Less than 3 months	69	46.0%
	3~6 months	23	15.3%
	6 months~ 1 year	18	12.0%
	More than 1 year	40	26.7%
Voluntary	Individual	121	80.7%
	Recommended by others	29	19.3%

4.2 Confirmatory Factor Analysis (CFA)

The results of Confirmatory Factor Analysis (CFA) are shown in Table 2.

Table 2. Results of Confirmatory Factor Analysis (CFA)

Aspect	Question	Original Sample	S.E.	*T*	P	CR	AVE
Performance Expectancy	PE1	.869	.029	29.616	.000	.934	.671
	PE2	.883	.023	37.840	.000		
	PE3	.835	.029	28.823	.000		
	PE4	.863	.027	31.932	.000		
	PE5	.709	.055	12.884	.000		
	PE7	.757	.058	13.071	.000		
	PE8	.804	.038	21.227	.000		
Effort Expectancy	EE1	.802	.044	18.133	.000	.925	.639
	EE2	.787	.054	14.653	.000		
	EE3	.739	.071	10.360	.000		
	EE4	.803	.042	18.981	.000		
	EE6	.797	.030	26.384	.000		
	EE7	.824	.033	25.230	.000		
	EE8	.839	.034	24.778	.000		
Social Influence	SI1	.829	.032	25.937	.000	.923	.705
	SI2	.861	.027	31.535	.000		
	SI3	.867	.022	39.074	.000		
	SI4	.857	.024	35.411	.000		
	SI5	.783	.034	23.201	.000		
Facilitating Conditions	FC1	.903	.023	38.961	.000	.925	.805
	FC2	.913	.020	45.627	.000		
	FC3	.875	.020	43.888	.000		
Behavior Intention	BI1	.949	.010	97.050	.000	.958	.884
	BI2	.944	.011	85.683	.000		
	BI3	.928	.015	63.884	.000		
Use Behavior	UB1	.876	.030	28.925	.000	.887	.797
	UB3	.909	.016	58.182	.000		

Table 3 presents the results of convergence validity.

Table 3. Results of convergence validity

	PE	EE	SI	FC	BI	UB
PE	.819					
EE	.717	.799				
SI	.753	.724	.840			
FC	.776	.714	.746	.897		
BI	.722	.733	.731	.788	.940	
UB	.740	.699	.732	.792	.850	.893

**NOTE: PE (Performance Expectancy); EE (Effort Expectancy); SI (Social Influence); FC (Facilitating Conditions); BI (Behavior Intention); UB (Use Behavior)*

As Table 2 shows, the factor loading of each item is between .709 ~ .949, which has good convergent validity. The CR value of each aspect is between .887 ~ .958, which meets the standard above 0.7 recommended by Hair et al. (1998), which indicates that each facet has good internal consistency. The AVE value of each aspects is between .639 ~ .884, which complies with the standard of 0.5 or more recommended by Fornell & Larcker (1981), indicating that each aspect has convergence validity. Hair et al. (1998) suggested that the correlation coefficient between each aspect should be less than the root value of the average amount of extraction (AVE value) of each dimension which represents the difference between facets. Table 3 shows that the AVE value of each aspect is greater than the correlation coefficient with other aspects after the root sign, which means that each scale has different validity.

4.3. Structural Equation Model

The hypothesis test results are presented in the following table (Table 4).

Table 4. Results of hypothesis

Path	Original Sample	S.E.	*t*	P value
PE -> BI	.265	.086	3.092	.002
EE -> BI	.332	.093	3.569	.000
SI -> BI	.291	.088	3.300	.001
FC -> UB	.320	.073	4.382	.000
BI -> UB	.598	.070	8.525	.000

**NOTE: PE (Performance Expectancy); EE (Effort Expectancy); SI (Social Influence); FC (Facilitating Conditions); BI (Behavior Intention); UB (Use Behavior)*

Table 4 shows that the significance test of each path takes the t-value>1.96 as the critical value and shows whether the causality between the variables reaches a statistically significant level. The results from Table 4 present that each path is statistically significant, and performance expectancy, effort expectancy and social influence have a direct positive impact on behavioral intentions, with impact coefficient values of .265, .332, and .291, respectively. Facilitating conditions and behavioural intentions have a direct positive impact on usage behavior, with coefficient values of .320 and .598, respectively. The above results verify the hypotheses H1 ~ H5 of this research.

Table 5 presents the results of the overall mode.

Table 5. Results of the overall mode

Aspect	**AVE**	**Composite Reliability**	**R^2**	**Cronbach's α**	**redundancy**	**GOF**
Performance Expectancy	.671	.934		.918		
Effort Expectancy	.639	.925		.906		
Social Influence	.705	.923		.895		.727
Facilitating Conditions	.805	.925		.879		
Behavior Intention	.884	.958	.648	.934	.333	
Use Behavior	.797	.887	.762	.747	.322	

PLS-SEM uses the GOF value to evaluate the overall model fit, uses Cronbach's α to measure the internal consistency and stability of the dimensions, and R^2 represents the degree of potential internal interpretation of the model. According to the results of Table 5, the overall model fit of this research is 0.727 with a good model fit; Cronbach's α of the aspects are all above 0.8 with good model fit; R^2 of behavioural intention and usage behavior are 0.648 and 0.762 respectively, representing that the model has a moderate-high degree of predictive power (Figure 2).

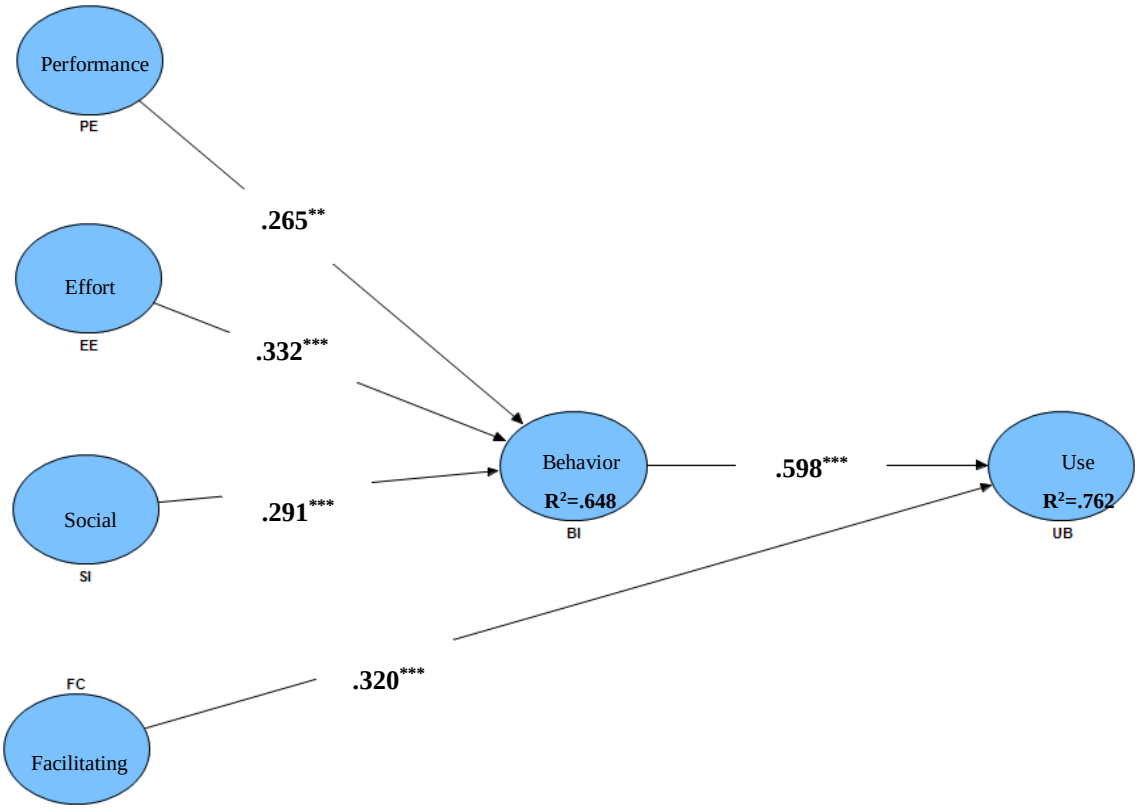

Figure 2. Structural Equation Model

4. DISCUSSION

The results of the study show us that hypotheses H1 ~ H5 are all established which indicates that Facebook users believe that online fitness live classes enable them to obtain effective fitness knowledge and they receive help in improving their fitness. As Greenhow, Robelia & Hughes (2009) stated, Facebook is based on the principles of mutual support and participation to create blended learning through cyberspace. Users of the community platform can share effective fitness knowledge and concepts with each other through the interaction and dialogue of the live fitness videos and live streamers to effectively improve personal understanding of fitness

The live streaming and functions provided by Facebook are easy to operate and convenient for users. Users are willingness to use through simple and uncomplicated systems, which this is one of the advantages that make Facebook the mainstream of social media. Therefore, effort expectancy has a positive effect on behavioural intention, which is also consistent with the research findings of Rodrguez, Trujillo & Lozano (2014).

Facebook is a very popular community website Many people are affected by sharing and message development of others on the board, which will trigger the willingness to use and watch live streaming. This result is also in line with the research result of Gruzd, Staves & Wilk (2012) which show that social impact has an important influence on individuals intention to use the social media system.

The convenience and infinity of the Internet allows the social media users to obtain effective information through fast and real-time communication media, and most users have the important resources and knowledge required for live streaming. For the users of social platforms, Facebook fitness live streaming is a great time-saver, and they can obtain effective fitness knowledge without spending too much effort.

5. RECOMMENDATIONS

Since Taiwan has gradually developed into an aging society, the care of the elderly people has received much attention. This research recommends the government and operators to use a new form of live streaming for sports teaching courses and activities for the elderly in the future. Considering safety aspects, allocating appropriate instructors to assist and provide an interesting and healthy senior activities for the elderly people is necessary.

As a result of this research, we have learned the influencing factors and the substantial benefits of Facebook live streaming users on the fitness live teaching methods. However, as the fitness live streaming instruction includes very difficult and dangerous training activities, the users' perception of fitness live-teaching is one of the factors to be understood due to the lack of professional side-by-side guidance by the coaches. Therefore, it is recommended that the perception risk factors are taken into interference variables for discussion in the future.

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AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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