

A STUDY ON THE MODEL OF CONTINUOUS USE OF  
INFORMATION SYSTEM TECHNOLOGY MANAGEMENT IN  
ATHLETIC TRAINING TEACHING AND ATHLETES – TAKING  
CABLE WAKEBOARDING FOR EXAMPLE

Chun-Chang Yen

Assistant Professor, Department of Recreation and Sports Management  
Tajen University, Taiwan, R.O.C.

Mao-Chou Hsu

Associate Professor, Department of Recreation and Sports Management,  
Tajen University, Taiwan, R.O.C.

Meng-Yuan Sung

Associate Professor, Department of Physical Education,  
National Chin-Yi University of Technology, Taiwan, R.O.C.

Abstract

This study aims to explore how modern sport management applies and develops information technology system. It treated cable wakeboard waterskiing as the target to further propose modernized sports instruction training and operational management model. According to related theories and findings on the continuous use model of information system, validation, perception, satisfaction, cognitive key and virtual ideology, this study explored and proposed research framework and hypotheses. Using Cronbach's, it tested the reliability and internal consistency of the scale. Confirmatory factor analysis was conducted to measure the variables of model, and SEM was employed to validate hypothesis relationship between variables and latent variables. The subjects of this study were coaches, athletes and members of the International Waterski and Wakeboard Federation (IWWF), five-star competitions recognized by the IWWF, cable waterskiing competitions in Asia and Oceania in 2017 and waterskiing clubs legally registered in Taiwan in 2018. The countries of participants include Australia, Japan, Singapore, Korea, Indonesia, Kuwait, Iran, Hong Kong, Thailand, the Philippines and Taiwan. This study distributed 100 questionnaires, and retrieved 98 valid samples, with a valid return rate of 98%. The results showed that there are direct correlations and mutual effects between validation and perception, validation and satisfaction, and perception and satisfaction of the users of the waterskiing information management platform. Based on the findings, this study proposed specific suggestions regarding the waterskiing information management platform and waterskiing education technology management.

Keywords: sports technology, sport management, sport communication, innovative instruction, behavioral intention

### Research Background and Motives

The Ministry of Economic Affairs, R.O.C. noted in the latest Industry Vision and Policy Development Report in 2018 that, in order to face social issues, such as sub-replacement fertility, aging, urbanization, and technologicalization, advanced countries around the world have started to develop and promote relevant prospective policies and measures and to engage in specific behaviors, such as assisting in industrial innovation, in an attempt to respond to the life technology application model under the rapid transformation of information technology. Artificial intelligence, information bandwidth, cloud data, Internet of things (IoT), smart management, etc. have all extended from information technologicalization and become the important development trends of Taiwan's current industrial, governmental and academic status (Taiwan Industrial Policy Prospective Research Project, 2018). Without a doubt, under the economic structure of recreation industry and the application and development of information technology in Taiwan, virtual teaching and training have been simultaneously put into practice in academia and industries in line with international trends. For example, the applications of virtual teaching of Facebook Oculus VR to the capturing of character images, virtual experience learning, 3D model development, integration of application scenarios, etc. have gradually become necessary models of new information technologies in the current

teaching, training, entertainment, and recording aspects, which have also started to change the self-learning patterns and sports learning approaches of the global population (Department of Industrial Technology, Ministry of Economic Affairs, 2017). Jacky (2016) took a new product of sports technology, Zwift online virtual sports training platform, which attaches importance to virtual reality, interactive games, and image recording, and suggested that such a product aims to improve the convenience, management, and diversity of sports learners. Wu & Kao (2008) suggested that the feedback messages provided by teaching visualization can utilize image reconstruction to perform self-inspection and engage in mutual learning so as to further improve self-reflection and specific performance of behaviors. From the perspective of multiple learning, the inspection of information technology and the application of images can also be used to enhance learners' different learning motivations (Santagata, Zannoni, & Stigler, 2007). Moreover, information record management can be employed to enable learners to fully observe more different physical performances, which will be significantly beneficial to learners' movement appreciation and analysis skills (Sööt & Leijen, 2012).

The intervention of information technology into athletic training and teaching in recent years has become a comprehensively used approach and tool by trainers and teachers. After the systematic management of

relevant information and data, such an approach/tool even has become an important reference for athletes to manage self-training and for research to focus on academic units. For example, Sheffield Hallam University in the U.K. has started to implement a teaching project that has been improved through sports technology. In this project, information technology is used to collect relevant sports digital information and data and to further develop specific models of athletic training courses so as to help athletes achieve great performances and obtain technological training management from events (Tseng & Tsai, 2010; Cho, J, 2016). Therefore, this study intends to retain the full videos of athletes' complicated movements during training and offer them an information platform for appreciation and discussion to assist coaches and players in using relevant information and data and further enhance athletes' multiple learning motivations and skill learning achievements. Sööt & Viskus (2014) suggested that in addition to skill training, movement education should attach more importance to individual development and learning. How to use information technology and the Internet to implement teaching, social interactions, and management has become an important issue attracting the attention of researchers in recent years (Dania et al., 2011). Based on the above, the 2018 policy implementation guidelines in Taiwan point out the use of digital technology to promote the sports and leisure industry and to build a foundation for the training of elite athletes, as well as the application of sports scientific training and modern technology management. They are some of the

important indices for the industrial development, training innovation, and flipping teaching of current sports in Taiwan (Executive Yuan, 2018).

Taiwan completed the construction of The Cable Park in 2013, making it the first park to meet the international standards in Taiwan, and started to regularly hold domestic and foreign large-scale waterskiing events. With the promotion and development of the International Waterski and Wakeboard Federation (IWWF), cable wakeboarding will become one of the events at the Summer Olympics in 2020. Therefore, now is an important stage for Taiwan to promote the development and management of cable wakeboarding, which is a sporting event that is widely known globally.

Cable wakeboarding focuses on physical coordination, movement skills, and brilliance in performance. As a result, it is necessary to pay more attention to players' actual situation, movement performance, physical fluidity, body language, and interactive learning during training to more easily improve their training efficiency, learning motivations, and skill performances (Lee, 2015a; Lee, 2015b; Huang and Lee, 2015). Lee and Wang (2016) indicated in Sport Sciences Supporting Strategies of Taiwan for the 2016 Rio Olympic Games that the intervention and assistance of sports science have become an important approach and tool adopted by current sports organizations in advanced countries in order to effectively manage organizations, train players, promote sports, and meet international standards. More-

over, the concept of “quantified self” has also gradually won recognition by the public, which has also contributed to the vigorous development of markets and products for many wearable devices. In addition, the concepts of sports, science, and health have been integrated with relevant products and services. Consequently, the management of sports information technology has become an important research field and direction (Chien Chang, Lee, and Shiang, 2016; Yao, 2017).

Information System Continuance Model (ISCM) is a behavioral model investigating users’ intention and correlation of cognitive belief, emotion, and continuous use and is one of the first quantified theoretical models employed for measuring the continuous use of information systems (Bhattacharjee, 2001a). Such a model can explain the level of perception, emotional attachment, and overall current status of development of specific self-behaviors of users, who continue utilizing an information system, as well as explore individuals’ perception, usability, and continuous use of specific things or objects. The application of such a model to the exploration of things or objects and self-development can reduce the costs of the overall environment and create positive and substantial benefits to selves, organizations, enterprises, society, etc. (Bhattacharjee, 2001b; Lee, 2010; Hsu, Chen, and Lee, 2015). Based on the above, with the rapid development of information technology, the application and management of information technology systems have become important application directions for various fields. The framework of

ISCM has thus been utilized to explain and predict users’ satisfaction with and intention to continue using an information system, in order to achieve accurate evaluation and understand critical factors affecting them (Huang et al., 2017). Bhattacharjee (2001ab) further proposed Confirmation, Satisfaction, and Perceived Usefulness as the constructs/indices for explaining or predicting the relevance of users’ subsequent behaviors (Davis, 1989).

Relevant past studies indicated that the confirmation and perception of individuals using an information system affect their intention to continue using it and the correlation with satisfaction. Confirmation affects users’ self-perception and self-satisfaction and may also intervene with their continuous use of relevant information systems in the future (Davis, 1989; Lin & Hsieh, 2007; Lee, 2010; Lu, Liu & Wei, 2017). Therefore, Oliver (1980) proposed the Expectation- Confirmation Theory (ECT), or the Expectation Gap Theory, to explain whether Expectation, Perceived Performance, Confirmation, Satisfaction, and Repurchase Intention have a direct or indirect effect on users’ continuous use, and such a theory started to be comprehensively applied and verified in relevant studies and theories. As a result, users’ confirmation of their acceptance of a system indeed affects their satisfaction with and perceived usefulness of the system. The correlation between them also intervenes with users’ specific perception and behaviors of subsequent use (Lu, Liu & Wei, 2017; Liu and Wu, 2017). The results of the study by Susanto, Chang and Ha (2016) where

enterprises in South Korea were taken as a sample showed that the perception, convenience, and need of users during system operation indeed lead to different self-awareness of use, which further directly affects the intention to reuse this system by themselves and the population in order to complete relevant operations and achieve the objectives set up by themselves. Therefore, this study proposes five relevant research hypotheses.

- H1: The confirmation of users of a water skiing sports information management platform has a significant effect on their perceived usefulness.
- H2: The confirmation of users of a water skiing sports information management platform has a significant effect on their satisfaction.
- H3: The perceived usefulness of users of a water skiing sports information management platform has a significant effect on their satisfaction.
- H4: The perceived usefulness of users of a water skiing sports information management platform has a significant effect on their continuous use.
- H5: The satisfaction of users of a water skiing sports information management platform has a significant effect on their continuous use.

Rheingold (1993) suggested that as long as there is a certain number of people using the Internet,

the constructs of specific practicality, such as continuous use, mutual exchange, and operational management, can be developed, and that a community and culture can be established by consensus. Therefore, virtual community consciousness forms an important core value in the community, and exchange, communication, and sharing enable users to accumulate common experiences and knowledge background (Blanchard, 2004). In addition to being able to retrieve information and data from a community, users who actively join a virtual community are also able to be satisfied with the improvement of a sense of belonging and the strengthening of interpersonal relationships (Wellman, 2005). Castro (2007) indicated that an Internet community can create a remote sense of presence and imagination for users and win them a sense of trust through the experiences of system information services, which can directly affect their intent to use and behavior of continuous use. The results of Yen et al. (2011) showed that an information technology system with a high sense of trust, high usability, high community features, and high consensus affects users' consciousness and behavior. Moreover, during the usage, users will change themselves, continue using it, or recommend it to others (Lu and Lee, 2014; Liao, 2016). Hsu and Lu (2004) suggested that the Internet or a specific information system indeed will affect user behaviors and will be affected by groups to further change selves or affect groups. Based on the above, the cognitive key is to transfer a positive perception and good experiences to users. Moreover, the use of an information system can be popu-



larized and integrated with life through sharing and an increase in users, which can improve their own usage effectiveness and objectives and further strengthen their behavior consciousness and sense of identity (Chiu and Chuang, 2013; Chang and Shao, 2017). We now present two further hypotheses.

H6: The virtual consciousness of users of a water skiing sports information management platform has a significant effect on their continuous use.

H7: The cognitive key of users of a water skiing sports information management platform has a significant effect on their continuous use.

Based on the above, the difference in confirmation and perceived usefulness of users using an information system indeed may affect their satisfaction with their use. In addition, users' cognitive key and virtual consciousness toward an information system may also affect their continuous use of the system. Therefore, the confirmation of an overall behavioral intention model and correlation of users using an information system make up an important foundation for future organizational management (Grönroos, 2006; Morrisson and Huppertz, 2010) as well as an important reference for teaching or training of first-line educators (DeWitt et al., 2013; Sööt & Viskus, 2014).

It is not enough for modern sports teaching to provide students with videos for observation and practice only (Fill & Ottewill, 2006). It is extremely difficult for students or

players to reflect on their learning if there is not any information e-platform that guides and helps them to engage in learning (Sööt & Leijen, 2012). Therefore, in addition to providing videos for browsing and clarifying the feedback content of images, an information system platform further uses technology management to provide critical messages to help players make professional judgments and predict whether their movement performance is accurate so as to further improve their self-image's ability to control limbs, reduce errors (Schmidt & Wrisberg, 2008), and more effectively grasp learning progress and improve learning performance (Kay, 2012). As a result, in order to surpass innovative teaching and organizational technology management and achieve synchronization of player information technology in future cable wakeboarding, it is necessary to better understand athletes' continuous use behavior for an information system. Only when relevant theoretical constructs are used to analyze the correlation can the modern management platform for athletes be proposed and established to achieve the specific objectives of developing players' physical and mental balance, skills, social interaction, and learning (Lee, 2015ab; Lin et al., 2016; Lai, 2016; Chien, Liang, and Chen, 2017).

## Research Method

### *Research Structure*

Based on the theories and research results concerning ISCM, confirmation, perceived usefulness, satisfaction, cognitive key, and virtual consciousness, this study pro-

pose the following specific research hypotheses and framework after the investigation.

- H1: The confirmation of users of a water skiing sports information management platform has a significant effect on their perceived usefulness.
- H2: The confirmation of users of a water skiing sports information management platform has a significant effect on their satisfaction.
- H3: The perceived usefulness of users of a water skiing sports information management platform has a significant effect on their satisfaction.
- H4: The perceived usefulness of users of a water skiing sports information management platform has a significant effect on their continuous use.
- H5: The satisfaction of users of a water skiing sports information management platform has a significant effect on their continuous use.
- H6: The virtual consciousness of users of a water skiing sports information management platform has a significant effect on their continuous use.
- H7: The cognitive key of users of a water skiing sports information management platform has a significant effect on their continuous use.

### *Research Subjects*

This study enrolled coaches, players, and members involved in 5-star event, 2017 Asia & Oceania Waterski Championships, certified by the IWWF and a waterskiing club in Taiwan in 2018 as the main research subjects. Eleven countries participated in the event, including Australia, Japan, Singapore, South Korea, Indonesia, Kuwait, Iran, Hong Kong, Thailand, Philippines, and Taiwan. This study conducted a questionnaire survey and then performed the statistical analysis. A total of 98 valid questionnaires were returned, including 30 questionnaires completed by female subjects (32%) and 68 questionnaires completed by male subjects (68%). All 98 subjects (100%) have used the Internet, and 89 subjects (90.8%) have watched online waterskiing events or teaching videos and information.

### *Measurement Tools*

This study used a structured questionnaire to obtain the data needed for verifying the research hypotheses. To meet the needs of the research purposes, the questionnaire content included 7 parts: personal basic information, user confirmation, user perceived usefulness, user satisfaction, user continuous use, user virtual consciousness, and user cognitive key. This study applied a

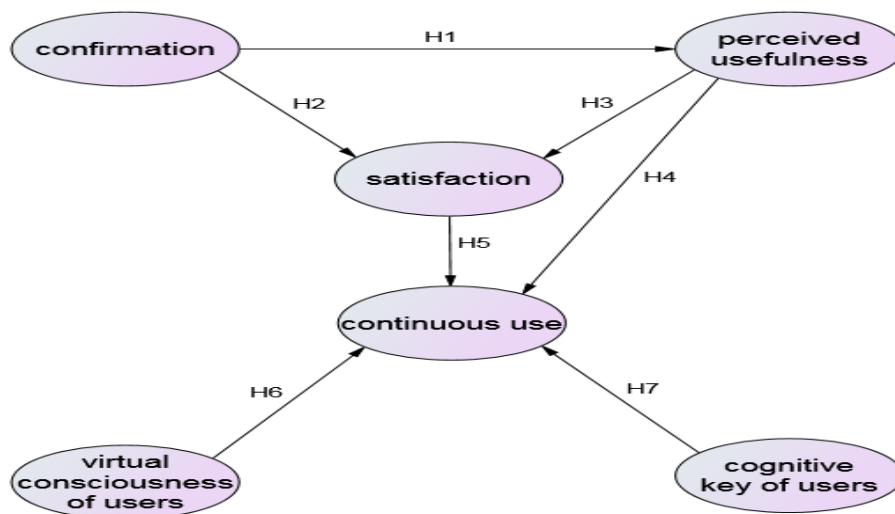


Figure 1. Model Framework of Continuous Use of Information System Technology Management in Athletic Training Teaching and Athletes

7-point Likert scale to the measurement of all the items (Bollen, 1989). The answers included: Strongly agree (7), Agree (6), Slightly Agree (5), Fair (4), Slightly Disagree (3), Disagree (=2), and Strongly Disagree (=1). Confirmation included a total of 5 items ( $\alpha$  reliability is .889); perceived usefulness included a total of 5 items ( $\alpha$  reliability is .872); satisfaction included a total of 5 items ( $\alpha$  reliability is .848); continuous use intention included a total of 5 items ( $\alpha$  reliability is .819); virtual community consciousness included a total of 5 items ( $\alpha$  reliability is .901); and cognitive key majority included a total of 5 items ( $\alpha$  reliability is .852).

#### Data Analysis

This study used statistical software, SPSS for 20.0 Windows and Mplus, to test and analyze the research samples and used Cronbach's coefficient to test the internal consistency

reliability of the scale. Afterwards, this study used Confirmatory Factor Analysis (CFA) to measure the variables of the model (Hair, Black, Babin, Anderson and Tatham, 2006). According to Kline (2005), a model has to be tested and measured before the correction of the two-stage model, and then the SEM can be further used to measure the hypothetical relationship between variables and potential variables (Memon & Rahman, 2013).

#### Results and Discussion

According to the suggestion from Anderson & Gerbing (1988), the analysis of a complete Structural Equation Model (SEM) is mainly divided into two stages. Stage 1 includes the Measurement Model. Stage 2 is the evaluation of the Structural Model. Based on the above, this study used Confirmatory Factor Analysis (CFA), which is equivalent to the evaluation of a



measurement model and is part 1 of the analysis of the Structural Equation Model (SEM), and then corrected the two-stage model of part 2 (Kline, 2005).

### Measurement Model

#### 1) Convergent Validity

For the measurement model, this study adopted maximum likelihood estimation. The estimated parameters included factor loading, reliability, convergent validity, and discriminant validity. According to the standards of convergent validity proposed by Fornell and Larcker (1981), this study performed the testing as follows: (1) the Standardized Factor Loading of each index variable is higher than .50; (2) Composite Reliability is higher than .60; and (3) Average Variance Extracted is higher than .50. Chin (1998) suggested that, ideally, the reliability and standardized factor loading of items should be higher than .7, and those higher than .6 are acceptable. Consequently, Hooper, Coughlan, & Mullen (2008) recommended that

items whose standardized factor loading is lower than .45 should be deleted, because they involve many errors. Moreover, the squared multiple correlation is the squared standardized factor loading.

Based on the above, this study tested relevant values according to the standards mentioned above and summarized non-standardized factor loading, standard error, significance test, standardized factor loading, squared multiple correlation, composite reliability, and average variance extracted in Table 1. The results showed that the standardized factor loading was .607-.859, meeting the standard, implying that the reliability of each item was acceptable. The composite reliability of the research constructs was .845-.904 (all higher than .7), meeting the standard recommended by Nunnally and Bernstein (1994), and suggested that the internal consistency of each construct was good. The AVE was .525-.655 (all higher than .5), meeting the standard proposed by Hair, Anderson, Tatham, and Black.

Table 1. Analysis Results of the Measurement Model of Continuous Use of Information System Technology Management in Athletic Training Teaching and Athletes

Construct	Item	Significance of estimated parameters			P-Value	Item Reliability		Construct Convergence validity	
		Unstd	S.E.	Unstd./S.E.		Std.	SMC	CR	AVE
Confirmation	CO1	1.000				0.719	0.517	0.891	0.620
	CO2	0.958	0.061	15.636	0.000	0.787	0.619		
	CO3	1.130	0.124	9.134	0.000	0.849	0.720		
	CO4	1.009	0.114	8.867	0.000	0.837	0.701		
	CO5	0.826	0.136	6.081	0.000	0.729	0.531		
Perceived usefulness	PU1	1.000				0.754	0.569	0.878	0.590
	PU2	1.250	0.147	8.534	0.000	0.760	0.578		

	PU3	1.020	0.136	7.524	0.000	0.800	0.641		
	PU4	1.064	0.230	4.624	0.000	0.727	0.529		
	PU5	0.968	0.129	7.520	0.000	0.795	0.633		
Satisfaction	SA1	1.000				0.721	0.520	0.850	0.533
	SA2	1.033	0.113	9.110	0.000	0.719	0.518		
	SA3	1.337	0.160	8.356	0.000	0.813	0.660		
	SA4	1.056	0.184	5.728	0.000	0.663	0.440		
	SA5	0.974	0.122	8.002	0.000	0.730	0.532		
Continuous use	CI1	1.000				0.748	0.560	0.845	0.525
	CI2	0.869	0.118	7.384	0.000	0.679	0.462		
	CI3	1.000				0.697	0.486		
	CI4	1.210	0.243	4.984	0.000	0.607	0.368		
	CI5	1.026	0.126	8.141	0.000	0.859	0.738		
Virtual consciousness	VC1	1.000				0.792	0.627	0.904	0.655
	VC2	0.935	0.094	9.975	0.000	0.792	0.627		
	VC3	0.904	0.113	8.006	0.000	0.791	0.626		
	VC4	0.935	0.099	9.439	0.000	0.842	0.709		
	VC5	0.802	0.084	9.590	0.000	0.827	0.684		
Cognitive key	CM1	1.000				0.771	0.595	0.863	0.560
	CM2	0.530	0.109	4.862	0.000	0.647	0.418		
	CM3	0.499	0.120	4.145	0.000	0.674	0.455		
	CM4	0.911	0.087	10.450	0.000	0.807	0.651		
	CM5	0.939	0.085	11.071	0.000	0.825	0.680		

(1998), Fornell and Larcker (1981)  
 2) Discriminant Validity and denoting that the convergent reliability of each construct was good.

This study adopted the rigorous AVE method to test the discriminant validity of the model. Fornell and Lacker (1981) suggested that during the application of discriminant validity, it is necessary to concurrently take into account the relationship between convergent validity and constructs. Therefore, they said that

the square root of AVE of each construct should be greater than the correlation coefficient among constructs to meet the standard and to show that there is discriminant validity in the research model. Based on the above, after the verification, this study discovered that the square root of AVE of each construct was greater than the diagonal correlation coefficient, implying that the discriminant validity of each construct was good, as shown in Table 2.

Table 2. Analysis of Discriminant Validity of the Measurement Model of Continuous Use of Information System Technology Management in Athletic Training Teaching and Athletes

	AVE	CO	PU	SA	CI	CM	VC
CO	.620	<b>.787</b>					
PU	.590	.776	<b>.768</b>				
SA	.533	.806	.832	<b>.730</b>			
CI	.525	.741	.705	.746	<b>.725</b>		
CM	.655	.649	.617	.605	.663	<b>.809</b>	
VC	.560	.602	.576	.617	.674	.775	<b>.748</b>

CO=confirmation; PU=perceived usefulness; SA=satisfaction; CI=continuous use; VC=virtual consciousness; CM =cognitive key majority.

### 3. Structural Model Analysis

After testing the measurement model of “continuous use of information system technology management in athletic training teaching and athletes,” this study performed structural model analysis and maximum likelihood estimation, including model fit, significance test of research hypotheses, and explained variance ( $R^2$ ). However, SEM is an analysis method for large sample sizes. Therefore, the P value tends to be less than .05, which can cause a false rejection of a hypothesis and reach a conclusion of a poor model.

Therefore, Kline (2005) and Schumacker and Lomax (2010) suggested that the model fit should not be determined by the p value, and different goodness-of-fit indices should be proposed to determine whether the model fit is good. As a result, this study used 9 goodness-of-fit indices that are the most comprehensively used to analyze the research model according to the study by Jackson, Gillaspay, and Purc-Stephenson (2009) where relevant theories of 194 SSCI international academic papers were investigated, as shown in Table 3. After rigorous analysis of the model, the results

showed that except for  $\chi^2$  (the smaller the value, the better the model fit), all the goodness-of-fit indices met the standards recommended (Schumacker and Lomax, 2010). Because  $\chi^2$  is very sensitive to large sample sizes, chi-square value/degree of freedom is required for the evaluation. Moreover, the ideal value of a good model fit should be less than 3. Therefore, Hu and Bentler (1999) indicated that each index should be independently evaluated, and more rigorous goodness-of-fit indices should be used to concurrently control type I and type II errors, such as Standardized RMR <.08 and CFI>.90 or RMSEA <.08.

After the numerical verification steps and analysis and verification of the model mentioned above, the path coefficient results of the model, as in Table 4, showed in the measurement model of continuous use of information system technology management in athletic training teaching and athletes that the confirmation of users of a water skiing sports information management platform ( $b=.751$ ,  $p<.001$ ) has a significant effect on their perceived usefulness, and confirmation ( $b=.298$ ,  $p=.039$ ) and perceived usefulness ( $b=.592$ ,  $p<.001$ )

Table 3. Model Fit Analysis of the Measurement Model of Continuous Use of Information System Technology Management in Athletic Training Teaching and Athletes

Model fit	Criteria	Model fit of research model
ML $\chi^2$	The small the better	978.178
DF	The large the better	395.000
Normed Chi-square ( $\chi^2/DF$ )	$1 < \chi^2/DF < 3$	2.476
RMSEA	<0.08	0.085
SRMR	<0.08	0.068
TLI (NNFI)	>0.9	0.854
CFI	>0.9	0.868
GFI	>0.9	0.798
AGFI	>0.9	0.778

have a significant effect on satisfaction. Perceived usefulness ( $b=-.727$ ,  $p=.512$ ), satisfaction ( $b=1.566$ ,  $p=0.213$ ), virtual consciousness ( $b=0.204$ ,  $p=0.432$ ), and cognitive key ( $b=-.007$ ,  $p=.981$ ) have a significant effect on cognitive key. Based on the above, the path coefficient diagram of the research model is summarized in Figure 2. The results of relevant values also showed that confirmation can explain 80.3% of perceived usefulness; confirmation and perceived usefulness can explain 96.1% of satisfaction; and perceived usefulness, satisfaction, virtual consciousness, and cognitive key can explain 87% of continuous use.

Therefore:

- H1 is supported (value=.751);
- H2 is supported (value=.298);
- H3 is supported (value=.592);
- H4 is not supported (value=-.727);
- H5 is not supported (value=1.566);
- H6 is not supported (value=.204);
- H7 is not supported (value=-.007).

## Discussion

This study used the statistical methods mentioned above to test and verify the relevant hypotheses and judged the effects among potential variables based on critical ratios. This study used path coefficient values of the model to confirm the significance level and whether the research hypotheses were supported.

Therefore, the verification results of the research hypotheses are summarized as follows.

1. Analysis on the relationship between the confirmation of users of a water skiing sports information management platform and perceived usefulness.

H1: "The confirmation of users of water skiing sports information management platform has a significant effect on perceived usefulness" is supported.

Table 4. Regression Coefficient Analysis of the Measurement Model of Continuous Use of Information System Technology Management in Athletic Training Teaching and Athletes

DV	IV	Unstd	S.E.	Unstd./S.E.	P-Value	Std.	R <sup>2</sup>
PU	CO	0.751	0.096	7.812	0.000	0.896	0.803
SA	CO	0.298	0.145	2.060	0.039	0.377	0.961
	PU	0.592	0.162	3.662	0.000	0.628	
CI	PU	-0.727	1.108	-0.656	0.512	-0.659	0.870
	SA	1.566	1.258	1.245	0.213	1.337	
	VC	0.204	0.260	0.786	0.432	0.303	
	CM	-0.007	0.281	-0.023	0.981	-0.013	

CO=confirmation; PU=perceived usefulness; SA=satisfaction; CI=continuous use; VC=virtual consciousness; CM=cognitive key majority.

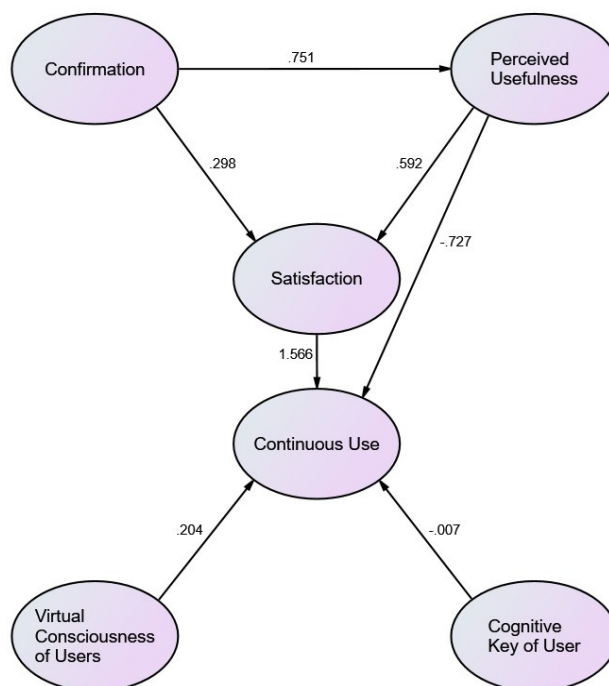


Figure 2. Model of Continuous Use of Information System Technology Management in Athletic Training Teaching and Athletes

This result is similar to that of the studies by Lin and Wang (2012) and Guo, Barnes, and Jia (2017). Thus, the expectation and obtainment of information system technology management by users of a water skiing sports information management platform are very important, because the self-meaning and scenario framework will affect selves' perceived usefulness of system application and management and further cause individuals to be involved in obstacles or problems.

2. Analysis on the relationship between the confirmation of users of a water skiing sports information management platform and satisfaction

H2: "The confirmation of users of water skiing sports information management platform has a significant effect on satisfaction" is supported.

This result is similar to that of the studies by Lin and Wang (2012), Sun, Fang and Zou (2016). Thus, the practicality and value of information system technology management to users of a water skiing sports information management platform are very important, because higher knowledge power and power structure of individuals for the system will further affect their satisfaction and continuous use.

3. Analysis on the relationship between the perceived usefulness of users of a water skiing sports information management platform and satisfaction

H3: "The perceived usefulness of users of water skiing sports information management platform has a significant effect on satisfaction" is supported.

This result is similar to that of the studies by Hsia, Huang and Hwang (2015) and Cho (2016). Thus, the applicability and ease of use of information system technology perceived by users of a water skiing sports information management platform are very important, because higher operational convenience and interactivity perceived by individuals will affect their development of positive value for system use and further affect their satisfaction.

4. Analysis on the relationship between the perceived usefulness of users of a water skiing sports information management platform and continuous use.

H4: "The perceived usefulness of users of water skiing sports information management platform has a positive effect on continuous use" is not supported.

This result is different from that of the studies by Tsai, Cheng, and Chen (2011) and Guo, Barnes, and Jia (2017). The reason might be that currently the IWWF and formal and official organizations of water-skiing in various countries have not established a certification system or set up an organizational and systemic Internet platform, resulting in players' lack of information, low information reliability, or a lack of management that affects users' loyalty to



information system browsing and intention to recommend.

5. Analysis on the relationship between the satisfaction of users of a water skiing sports information management platform and continuous use.

H5: "The satisfaction of users of water skiing sports information management platform has a significant effect on continuous use" is not supported.

This result is different from that of the studies by Lee (2010) and Chen, Yu, and Li (2016). The reason might be, as extended from the viewpoint on the effect of perceived usefulness on continuous use mentioned above, because users' loyalty and intention to recommend are low, and hence their continuous use intention is further affected.

6. Analysis on the relationship between the virtual consciousness of users of a water skiing sports information management platform and continuous use

H6: "The virtual consciousness of users of water skiing sports information management platform has a significant effect on continuous use" is not supported.

This result is different from that of the studies by Bart, Shankar, Sultan, & Urban (2005) and Tsai, Cheng, and Chen (2011). The reason might be because, as extended from the viewpoint on the effect of perceived usefulness on continuous use mentioned above, the lack of an official organization and representative

information system Internet browsing platform and the lack of a verification and accreditation system for online information and messages influence users' sense of trust in virtual consciousness and cause groups' continuous use of system platform. Bart, Shankar, Sultan, and Urban (2005) emphasized that the profession of a message source is the fundamental requirement for Internet trust.

Therefore, the profession and fairness of websites are very important. If the recommendation messages on blogs can provide sufficient information and services, then users can also develop trust in the blogs and relevant messages. The higher the trust is, the higher the users' behavioral intention to browse blogs is (Birgit, 2001; Castro, Armario & Ruiz, 2007).

7. Analysis on the relationship between the cognitive key of users of a water skiing sports information management platform and continuous use.

H7: "The cognitive key of users of water skiing sports information management platform has a significant effect on continuous use" is not supported.

This result is different from that of the studies by Hsu and Lu (2004) and Schmidt & Wrisberg (2008). The reason might be that, as extended from the viewpoint on the effect of virtual consciousness on continuous use mentioned above, the profession and fairness of an information system platform are the fundamental requirements affecting us-

ers' Internet trust. Tseng & Tsai (2007) and Chen, Liu, Shih, Wu & Yuan (2011) indicated that common online systems can increase learners' opportunity at multiple learning and reduce the pressure of interactive learning in peer scenes. Science and technology should be used to provide individualized instruction, communication, and feedback in order to improve and elevate teaching quality, rather than to replace the entire learning and training process (Dania et al., 2011). Consequently, at present, the trust, profession, and fairness of the Internet have become important observation indices for modern information technology or online teaching. These may also be what the platform is currently deficient in, which further affects the relationship between cognitive key and continuous use.

### Conclusions and Suggestions

After an investigation of relevant theories and statistical tests and analyses using the research methods and design, this study found that there are indeed potential correlations and mutual effects between confirmation and perceived usefulness, confirmation and satisfaction, and perceived usefulness and satisfaction of users of a water skiing sports information management platform. Therefore, this study propose specific suggestions as follows.

1. Suggestions on a water skiing sports information management platform. According to the research results, in the "model of continuous use of information system technology management in athletic training teaching and athletes," "confirma-

tion" is very important, because this variable directly affects the correlation between perceived usefulness and satisfaction. Therefore, in future management, the "knowledge power" and "power structure" of the platform should be strengthened, because the development of "knowledge power" can convert text messages and image files into accurate, important, and systemic information for transmission to enable users to engage in learning and exchanges in the professional fields to which they attach importance. In this way, users can develop attachment and further establish usage habits and reliability to increase the perception and experience value of confirmation, which is very important to "confirmation." In terms of "perceived usefulness," "power structure" should be developed, because users will develop a relevant strength of perceived usefulness after the confirmation. Users' perceived usefulness and cognitive belief are extended from perceived usefulness, which further affects their behavioral intention. Therefore, the identity or class of platform users, such as coaches, players, and members, can be further used to divide the platform into basic platform, advanced platform, high-level platform, or theme platform to assist users in self-inspection and help in the interactions and exchanges between users of the same class. In this way, the learning effectiveness can be improved and the level of profession can be elevated. Creating a specific platform for professional use can increase users' perceived usefulness and satisfaction.

2. Suggestion on technology management of waterskiing sports educa-

tion. The Internet, information systems, big data, technology management, etc. have all become important sports management trends in various advanced countries. According to the research results, users of a waterskiing information system all have used the Internet for learning and utilized relevant messages to enhance themselves and develop learning skills. Therefore, the development of modern waterskiing teaching and training, school waterskiing sports, national waterskiing sports, competitive waterskiing sports, and commercial waterskiing sports in the future will be fully dependent upon waterskiing sports educators' new model of "technology-based teaching materials and teaching methods," as well as technology management and application of a waterskiing information system.

Therefore, based on the research results of the correlation among confirmation, perceived usefulness, and satisfaction, this study suggests that "vertical development" is required for a waterskiing information system: school waterskiing courses should be digitalized and graded. Moreover, "knowledge power" should be developed to enhance the brand and education of information and to improve the confirmation of student and public users.

For "virtual union:" industries should be combined with commercial models, and teaching materials and products should be classified and integrated to help combine online virtual teaching with physical stores so as to popularize the market of waterskiing sports in the aspects of life and services. For "cross-border de-

velopment:" the system should be combined with the diversity of competitive waterskiing sports, and national players and professional players should be hired as faculties within the information system platform. Moreover, activities or teaching should be regularly provided at waterskiing clubs in order to understand waterskiing sports participants' actual needs and motivations, solve their problems, develop affections, and expand the potential market population, which would then increase the reputation and usage of the information system platform. In the future, work opportunities can be further developed on the market for sports coaches to create and promote the overall environment and industrial chain of national or enterprise organizations in waterskiing sports.

## References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin*, 103(3), 411-423.
- Bigné, J.E., Sánchez, M.I., & Sánchez, J. (2001). Tourism image, evaluation variables, and after purchase behavior: Interrelationship. *Tourism Management*, 22(6), 607-616.
- Bhattacharjee, A. L. (2001a). An Empirical Analysis of the Antecedents of Electronic Commerce Service Continuance. *Decision Support System*, 32(2), 201-214.

- Bhattacharjee, A. L. (2001b). Understanding Information Systems Continuance: An Expectation-Confirmation Model. *MIS Quarterly*, 25(3), 351-370.
- Blanchard, A. L. (2004). Virtual Behavior Settings: An Application of Behavior Setting Theories to Virtual Communities. *Journal of Computer Mediated Communication*, 9(2), 100-111.
- Bart, Y., Shankar, V., Sultan, F., & Urban, G. L. (2005). Are the drivers and role of online trust the same for all web sites and consumers? A large-scale exploratory empirical study. *Journal of Marketing*, 69 (4), 133-152.
- Bollen, K. A. (1989). *Structural equations with latent variables*. New York, NY: John Wiley & Sons.
- Chen, Y. L., Liu, E. Z. F., Shih, R. C., Wu, C. T., & Yuan, S. M. (2011). Use of peer feedback to enhance elementary students' writing through blogging. *British Journal of Educational Technology*, 42(1), E1-E4.
- Castro, C. B., Armario, E. M., & Ruiz, D. M. (2007). The influence of market heterogeneity on the relationship between a destination's image and tourists' future behavior. *Tourism Management*, 28, 175-187.
- Chun-Chang, Yen, Chih-Yu Liu, Wei-San, Su, Chii-Hwa, Liang, Chia-Ming Chang (2011). Verification of a Destination Image Influence Model for Taiwan Bicycle Tourism Blogs for Chinese Tourists. *African Journal of Business Management*. 5(19), 7931-7938.
- Cho, J. (2016). The impact of post-adoption beliefs on the continued use of health apps. *International Journal of Medical Informatics*, 87, 75-83.
- Chin, W. W. (1998). Commentary: Issues and Opinion on Structural Equation Modeling. *Management Information Systems Quarterly*, 22(1), 7-16.
- Dania, A., Hatziharistos, D., Koutsouba, M., & Tyrovola, V. (2011). The use of technology in movement and dance education: Recent practices and future perspectives. *Procedia Social and Behavioral Sciences*, 15, 3355-3361.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- DeWitt, D., Alias, N., Siraj, S., Yaa-kub, M. Y., Ayob, J., & Ishak, R. (2013). The potential of Youtube for teaching and learning in the performing arts. *Procedia-Social and Behavioral Sciences*, 103, 1118-1126.
- Fill, K., & Ottewill, R. (2006). Sink or swim: taking advantage of developments in video streaming. *Innovations in Education and Teaching International*, 43(4), 397-408.

- Fornell, C. R., & Lacker, D. F. (1981). Two structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39-50.
- Grönroos, C., (2006). *Service Management and Marketing*, 3th ed., John Wiley and Sons, New York.
- Guo, Y., Barnes, S. J., & Jia, Q. (2017). Mining meaning from online ratings and reviews: Tourist satisfaction analysis using latent dirichlet allocation. *Tourism Management*, 59, 467-483.
- Hsu, C. - L., & Lu, H. - P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & Management*, 41(7), 853-868.
- Hair, Jr., J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate Data Analysis*(6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- Hair, J. F. Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*(5th ed.). Upper saddle River, NJ: Prentice Hall.
- Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1), 53-60.
- Joo, S., & Choi, N. (2016). Understanding users' continuance intention to use online library resources based on an extended expectation-confirmation model. *The Electronic Library*, 34(4), 554-571.
- Jackson, D. L., Gillaspay Jr, J. A., & Purc-Stephenson, R. (2009). Reporting practices in confirmatory factor analysis: An overview and some recommendations. *Psychological methods*, 14(1), 6-23.
- Kay, R. H. (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. *Computers in Human Behavior*, 28(3), 820-831.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2. nd. ed.). New York: Guilford Press.
- Lee, M. - C. (2010). Explaining and predicting users' continuance intention toward e-learning: An extension of the expectation-confirmation model. *Journal of Computers & Education*, 54(2), 506-516.
- Lin, C. J. S. & Hsieh, P. L. (2007). The influence of technology readiness on satisfaction and behavioral intentions toward self-service technologies. *Computers in Human Behavior*, 23(3), 1597-1615.
- Lin, W. - S., & Wang, C. - H. (2012). Antecedences to continued intentions of adopting e-learning system in blended

- learning instruction: A contingency framework based on models of information system success and task-technology fit. *Journal of Computers & Education*, 58, 88-99.
- Lu, J., Liu, C., & Wei, J. (2017). How important are enjoyment and mobility for mobile applications? *Journal of Computer Information Systems*, 57(1), 1-12.
- Morrisson, O., and Huppertz, J. W., (2010). External equity, loyalty program membership, and service recovery. *Journal of Services Marketing*, 24(3), 244-254.
- Memon, A. H., & Rahman, I. A. (2013). Analysis of cost overrun factors for small scale construction projects in Malaysia using pls- sem method. *Modern Applied Science*, 7(8), 78-88.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Rheingold, H. (1993). *The Virtual Community: Homesteading on the Electronic Frontier*, Reading, Boston, MA: Addison-Wesley.
- Santagata, R., Zannoni, C., & Stigler, J. W. (2007). The role of lesson analysis in pre-service teacher education: An empirical investigation of teacher learning from a virtual video-based field experience. *Journal of Mathematics Teacher Education*, 10(2), 123-140.
- Schmidt, R. A., & Wrisberg, C. A. (2008). *Motor learning and performance: A situation-based learning approach* (4th ed.). Champaign, IL: Human Kinetics.
- Sööt, A., & Leijen, Ä. (2012). Designing support for reflection activities in tertiary dance education. *Procedia-Social and Behavioral Sciences*, 45, 448-456
- Sööt, A., & Viskus, E. (2014). Contemporary Approaches to Dance Pedagogy–The Challenges of the 21st Century. *Procedia- Social and Behavioral Sciences*, 112, 290-299.
- Susanto, A., Chang, Y., & Ha, Y. (2016). Determinants of continuance intention to use the smartphone banking services: An extension to the expectation-confirmation model. *Industrial Management & Data Systems*, 116(3), 508-525.
- Sun, H., Fang, Y., & Zou, H. (2016). Choosing a fit technology: understanding mindfulness in technology adoption and continuance. *Journal of the Association for Information Systems*, 17(6), 377-412.
- Schumacker, R. E., & Lomax, R. G. (2010). *A beginner's guide to Structural equation modeling* (3 ed.). Taylor and Francis Group, LLC.
- Tseng, S. C., & Tsai, C. C. (2010). Taiwan college students' self-efficacy and motivation of



- learning in online peer assessment environments. *The Internet and Higher Education*, 13(3), 164-169.
- Tsai, M. - T., Cheng, N. - C., & Chen, K. - S. (2011). Understanding online group acceptance factors. *Total Quality Management and Business Excellence*, 22(10), 1091-1104.
- Tseng, S. C., & Tsai, C. C. (2007). On-line peer assessment and the role of the peer feedback: A study of high school computer course. *Computers & Education*, 49(4), 1161-1174.
- Wu, C. C., & Kao, H. C. (2008). Streaming Videos in Peer Assessment to Support Training Pre-service Teachers. *Educational Technology & Society*, 11(1), 45-55.
- Executive Yuan (2018). 2018 Policy Implementation Guidelines. Taipei: Executive Yuan, R.O.C.
- Lu, C.H., Lee, M.H. (2014). A Study of the Relationship between Internet Communication and Social Capital of College Students in Hua-Lien. *Tzu-Chi University Journal of the Humanities and Social Science*, 16, 129-164.
- Lee, Y.R., Wang, H.C. (2016). Sport Sciences Supporting Strategies of Taiwan for 2016 Rio Olympic Games. *Journal of Sports Performance*, 3(2), 79-83.
- Lee, K.C. (2015a). Development of and Business Model for Cable Wakeboarding Parks in Taiwan. *Journal of Taiwan Society for Sport Management*, 15(2), 147-172.
- Lee, K.C. (2015b). The Strategic Analysis of Water-Skiing Development in Taiwan. *Quarterly of Chinese Physical Education*, 29(2), 93-102.
- Lin, K.C., Lu, W.C., Ho, M.C., Chen, M.H., Liao, H.C. (2016). Study of Life Saving Association ROC water exercise instructor teaching effectiveness. *Journal of Sports Health and Leisure*, 7, 183-187.
- Chiu, M.H., Chuang, M.J. (2013). A Content Analysis of Facebook Pages for Children with Disability. *Journal of Educational Media & Library Sciences*, 50(3), 355-392.
- Kao, C.P. (2017). Theory and Practice in Sport Science Tests for Road Cyclists. *Journal of National Cheng Kung University Physical Education Research*, 49(1), 1-18.
- Chang, Y.W., Shao, J.L. (2017). Exploring Farmers' Information Seeking Behavior from the Perspectives of Information Channels. *Journal of Library and Information Studies*, 15(2), 67-99.
- Chien Chang, S.F., Lee, Y.H., Shiang, T.Y. (2016). The applications of wearable technology in sport science. *Quarterly*

- of Chinese Physical Education, 30(2), 121-127.
- Hsu, L.L., Chen, C.J., Lin, T.H. (2015). An Empirical Study of Backpackers' Continuing Usage Intention of Travel Website: Based on Expectation – Confirmation Theory. *Commerce & Management Quarterly*, 16(1), 47-88.
- Huang, R.R., Lee, K.C. (2015). Analysis on the Current Status of Sports and Tourism Resources of Cable Waterski Park in Lianchihtan. *Taiwan Journal of Sports Scholarly Research*, 59, 155-170.
- Huang, W.M., Yang, S.C., Lee, H. Y., Chen, C.C., Su, Y.H. (2017). Investigation on the satisfaction and continuance intention for Nursing Information Systems – Example of a Regional Teaching Hospital in Southern Taiwan. *International Journal of Advanced Information Technologies (IJAIT)*, 11(1), 54-66.
- Department of Industrial Technology, Ministry of Economic Affairs (2017). Perception of Economic Development Trends and Business Opportunities – Application Scenarios. Taipei: Department of Industrial Technology, Ministry of Economic Affairs (IT IS Research Team).
- Taiwan Industrial Policy Prospective Research Project (2018). Industry Vision and Policy Development in Taiwan. Taipei: Department of Industrial Technol-
- ogy, Ministry of Economic Affairs
- Liu, T.J., Wu, C.H. (2017). A Study on the Influencing Factors of Continuance Using Intention of Food and Beverage Management Students after Studying an Certified ELearning Course. *Journal of Hospitality and Tourism*, 14(1), 19-35.
- Lai, H. L. (2016). Sharing of Application of Computing Thinking to Information Teaching Design of Senior High School. *Pulse of Education*, 6, 143-155.
- Chien, K.P., Liang, J.C., Chen, S.F. (2017). Exploring the Relationships among Teaching Beliefs, Age and TPACK. *Chinese Journal of Science Education*, 25(1), 1-19.

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.