

Article

Effect of a Taekwondo Academy's Technology-Based Self-Service on Perceived Value and Intention to Use Continuously in the Interaction between Humans and Technology

Dong-Kyu Kim ¹, Na-Hye Kim ², Chae-Yun Oh ³, Jusun Jang ⁴, Hosung Nho ⁵ and Sung-Un Park ^{6,*}

¹ Department of Sports Science, Chungwoon University, 25 Daehak-gil, Hongseong-eup, Hongseong-gun 32224, Republic of Korea

² Department of Taekwondo, Kyunghee University, 1732 Deogyong-daero, Giheung-gu, Yongin-si 17104, Republic of Korea

³ Department of Coaching, Kyunghee University, 1732 Deogyong-daero, Giheung-gu, Yongin-si 17104, Republic of Korea

⁴ Department of Sports Science, Hanyang University, 55 Hanyangdeahak-ro, Sangnok-gu, Ansan-si 15588, Republic of Korea

⁵ Department of Liberal Arts and Science, Suwon Women's University, 72 Onjeong-ro, Gwonseon-gu, Suwon-si 16632, Republic of Korea

⁶ Department of Sports and Health, Hwasung Medi-Science University, 400-5 Namyangjungang-ro, Namyang-eup, Hwaseong-si 18274, Republic of Korea

* Correspondence: psu@hsmu.ac.kr; Tel.: +82-31-369-9217; Fax: +82-31-369-9116



Citation: Kim, D.-K.; Kim, N.-H.; Oh, C.-Y.; Jang, J.; Nho, H.; Park, S.-U. Effect of a Taekwondo Academy's Technology-Based Self-Service on Perceived Value and Intention to Use Continuously in the Interaction between Humans and Technology. *Appl. Sci.* **2022**, *12*, 12420. <https://doi.org/10.3390/app122312420>

Academic Editor: Joung Hwan Mun

Received: 28 October 2022

Accepted: 2 December 2022

Published: 5 December 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Abstract: As the competition among businesses intensifies and customer needs become increasingly diverse and complex, the need for personalized service has emerged. This study examines the effect of technology-based self-service (TBSS) characteristics of a Taekwondo academy on perceived value and intention to use continuously. The study sample consisted of masters managing a Taekwondo academy who had prior experience with TBSS. A total of 188 responses were collected using an online questionnaire. The collected data were analyzed using SPSS 23.0 and AMOS 23.0. The results demonstrated the following: first, among the sub-factors of TBSS characteristics, reliability, usefulness, and enjoyment were found to affect the perceived value positively; second, among the sub-factors of TBSS characteristics, usefulness and ease of use positively affected the intention to use continuously; and finally, the perceived value was found to affect the intention to use continuously positively. This study provides practical implications for more efficient use of the TBSS provided by a Taekwondo academy by discovering the relationship between the TBSS configuration of the Taekwondo academy, perceived value, and intention to use continuously.

Keywords: technology-based self-service; perceived value; intention to use continuously; human and technology; Taekwondo academy

1. Introduction

The proliferation of a non-face-to-face culture as a result of COVID-19 is increasing the popularity of digital-based services across industries. These changes are transforming the existing method of using human services as a medium for customers to receive services in a technology-oriented environment where they are directly or self-processed and supported. Technology-based self-service (TBSS) is becoming more popular, particularly in Korea, where kiosks and delivery applications are being developed [1].

TBSS refers to “all technological access means that enable customers to produce and use services instead of interacting with service enterprise employees and customers” [2]. In other words, TBSS is the overall activity or benefit that enables customers to perform services by themselves using the technology provided by the service provider [3]. TBSS

enables quick and convenient services without time or place restrictions [2] and can enhance business competitiveness by increasing productivity, saving labor costs, and reducing savings and operating costs. In addition, active participation in TBSS can lead to a friendly relationship with a company [4]. According to Fortune Business Insights, a global market research firm, the size of the global kiosk market is estimated to be about \$20.3 billion (23 trillion won) in 2020 and is predicted to grow to \$51 billion (58 trillion won) by 2028 [5].

TBSS is changing the way customers interact with businesses and employees and offers endless possibilities for redesigning services [6]. As the competition among businesses intensifies and customer needs become increasingly diverse and complex, the need for personalized service has emerged [7]. With the growing range of services in which machines are replacing employees [2,8], TBSS is also being applied in sports. Many children practice Taekwondo in Korea [9], with approximately 9654 operational Taekwondo academies in the country [10]. Moreover, in Korea, where this research was conducted, Taekwondo masters serve as administrators who operate and manage Taekwondo academies and as educators who teach Taekwondo [11]. Specifically, the title Taekwondo master is given to a person possessing an official 4-dan certificate issued by Kukkiwon, who has a Taekwondo master instructor license of level 3 or higher [12]. Taekwondo academies have now become a part of the sports industry as well as a place where children are taught.

In general, for-profit groups, such as Taekwondo academies, use TBSS to gain a competitive advantage and reduce costs. In other words, understanding the intention or attitude of customers (i.e., Taekwondo academies) toward new technologies, such as the TBSS, is expected to provide significant theoretical implications to service companies in the future in providing services via TBSS. In addition, through this study, it will be possible to contribute to the improvement of time and work efficiency of Taekwondo masters who are simultaneously performing Taekwondo teaching and operation at Taekwondo academies. These advantages may have practical implications for increasing the effectiveness of TBSS in companies that provide TBSS. Therefore, the TBSS provided by the current academies is a different service concept from the past, when the focus was only on teaching Taekwondo. Examining the effect of TBSS characteristics of Taekwondo academies on perceived value and intention to use continuously can have a positive impact on the management and development of Taekwondo academies as a point of convergence for humans and technology. Therefore, in this study, enjoyment, usefulness, ease of use, and reliability were set as key attributes of TBSS. This study aimed to examine the effect of the TBSS characteristics of a Taekwondo academy on perceived value and intention to use continuously.

2. Literature Review

According to Meuter et al. [2], TBSS includes telephone/interactive response, on-line/internet, and interactive kiosk, depending on the interface. Taekwondo academies use TBSS, such as social media and online applications, to connect masters, children, and their parents together [13]. In addition, various other services are provided via the TBSS, such as sending text messages when children enter the Taekwondo academy to obtain parents' trust and confidence. Furthermore, several studies have found that social media or service characteristics of Taekwondo academies influence training satisfaction and intention to continue [14,15].

Dabholkar [16], Dabholkar and Bagozzi [17], and Curran and Meuter [18] have emphasized that ease is a significant factor in self-service technology. Lin and Hsieh [8] suggested the following attributes of self-service technology: functionality, enjoyment, safety/privacy, confidence, design, convenience, and customization [8]. Kang and Nam [19] proposed seven service quality items—functionality, enjoyment, security, confidence, design, convenience, and customization service—based on the attributes outlined by Lin and Hsieh [8]. However, Globerson and Maggard [20] argued that it is crucial to identify who is attracted to TBSS operations and design them to meet consumer demands because the attractiveness of TBSS varies.

The most important reason why consumers use TBSS is to judge its economic or utility value and predict its usefulness [2]. Parasuraman [21] stated that the customer's experience value, such as the consumer's time, effort, and emotional energy, is determined according to the level of human and technical performance of the company. Perceived value is what one recognizes when the benefits outweigh the costs [22]. The perceived value of TBSS does not imply usability based on whether or not the technology is accepted, but it can measure the experience by encompassing overall emotions [23]. Therefore, when interacting with the technology, the user-perceived value of the TBSS characteristics is important [24]. In addition, perceived value is a broad concept formed by individual beliefs and attitudes [25]. Consumers may perceive the same product or service differently depending on their individual situation or subjective evaluation [26]. Therefore, a user's perceived value may vary depending on the characteristics of TBSS.

Furthermore, because interactions with technology are repeated in the TBSS service environment, the characteristics of TBSS can be estimated to significantly affect users' intention to continue using it. This interaction is an important variable in understanding customer behavioral intentions [27] and has played an important role in increasing customer loyalty [28]. Notably, according to Lee [29] and Meuter et al. [30], service characteristics such as usefulness, ease of use, and time of the technology base themselves induce motivation to use TBSS and influence mature use. Furthermore, Kuo [31] and Jeong [32] found that quality and perceived value significantly impact mobile service intention.

In order to validate the influence relationship, the following hypotheses were established in this study based on this theoretical relationship.

Hypothesis 1 (H1). *TBSS characteristics (enjoyment, usefulness, ease of use, reliability) have a significant positive influence on perceived value.*

Hypothesis 2 (H2). *TBSS characteristics (enjoyment, usefulness, ease of use, reliability) have a significant positive influence on the intention to use continuously.*

Hypothesis 3 (H3). *Perceived value has a significant positive influence on the intention to use continuously.*

3. Materials and Methods

3.1. Data Collection

To achieve the study objective, Taekwondo masters who had prior experience with TBSS by paying a fee to the service provider were chosen as the study sample. Data were collected from August to September 2022; an online questionnaire was distributed to masters managing Taekwondo academies in Korea. They were selected using convenience sampling. The online survey was completed using the Naver form, and the link was shared in social media groups, such as Kakao Talk, where the Taekwondo masters were active.

The number of participants necessary for the study was calculated using the G*Power software (ver. 3.1.9.7; Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany) with the following settings: alpha = 0.05; power = 0.9; and effect size = 0.15. Consequently, the required sample size for this study was 130. G*Power software calculates the number of samples and has been validated in numerous studies [33]. The online survey included a description of the survey and a request for participation. The system was set up to respond to the survey after ensuring agreement to the items set prior to the survey questions. To provide an understanding, the opening screen of the online questionnaire displayed a picture of TBSS mainly used in Taekwondo academies (e.g., "Taekwon-friends;" Minsface Corp, Seoul, Republic of Korea, "Edu-family;" Edu-family Corp, Yongin, Republic of Korea, 'Make-edu'; Make-edu Corp, Seoul, Republic of Korea, "Kizguard;" Sejong Telecom Corp, Seoul, Republic of Korea, "Care-I;" Care-I Corp, Seoul, Republic of Korea). In addition,

because respondents' responses may be biased if items to measure one construct are presented in order, the online questionnaire was designed to randomly present all items.

A total of 189 people responded, and 188 questionnaires (99%) were used for the final analysis, excluding the data of the respondent whose responses were unclear. The respondents included 163 men (86.7%) and 25 women (13.3%). The largest age group was 40 s ($n = 66$; 35.1%). The program usage period was found to be the highest in less than one year. Table 1 presents the descriptive statistics of the participants.

Table 1. General characteristics of the study participants.

Variable	Category	<i>n</i>	Percentage (%)
Gender	Male	163	86.7
	Female	25	13.3
Age groups	20 s	46	24.5
	30 s	54	28.7
	40 s	66	35.1
	Over 50 s	22	11.7
Usage period	Less than 1 year	114	60.6
	More than 1 year–Less than 3 years	38	20.2
	More than 3 years–Less than 5 years	10	5.3
	More than 5 years	26	13.8
TBSS Preferred by Taekwondo academies	Taekwon-friends	52	27.7
	Edu-family	41	21.8
	Make-edu	34	18.0
	Kizguard	31	16.5
	Care-I	22	11.7
	Others	8	4.3
Total		188	100

3.2. Measures

An online questionnaire was used as the research tool in this study, and 27 items, except the 3 items (gender, age groups, and program usage period) of demographic characteristics, were measured on a 5-point Likert scale (1 = not at all, 5 = strongly agree). First, based on the items used in the study of Seiders, Voss, Godfrey, and Grewal [34], 12 items of TBSS characteristics (enjoyment, usefulness, ease of use, reliability) were constructed. Second, perceived value comprised nine items based on Sweeney, Soutar, and Johnson [35] and Sweeney and Soutar [36]. Third, the intention to use continuously comprised three items based on Bhattacharjee [37].

3.3. Validity and Reliability of the Measurement Tools

We determined the content and construct validity of the measurement tools used in this study. First, a content validity test was conducted with a professor related to the sports management major, in which the researcher reviewed the contents of the questionnaire to determine whether the measurement concept was adequately measured. Second, a confirmatory factor analysis (CFA) was performed to verify the construct validity of the questionnaire items. The convergent and discriminant validity of the constructed concept was examined using the results of the CFA. As a result of convergence validation, as shown in Tables 2 and 3, all path coefficients exceeded the standard value of 0.707 suggested by Kwon and Trail [38], and the average variance extracted (AVE) for each factor was found to exceed 0.50, the standard value of convergent validity. For discriminant validity verification, the AVE of the construct proposed by Fornell and Larcker [39] and the correlation coefficient squared value were compared. Consequently, the smallest value among the AVE values was 0.60, and the largest value among the correlation square values was 0.50; therefore, discriminant validity between the constructs was secured. In addition, as a result of examining Cronbach's α to measure the internal consistency of the items

measuring constructive concepts, the internal consistency exceeded the standard value of 0.70 suggested by Nunnally and Bernstein [40], thus the items for each factor were reliable.

Table 2. Results of CFA on TBSS characteristics.

Factors		Questions					β	SE	t	AVE	CR
Enjoyment	I enjoy providing services through the TBSS system						0.844	-	-	0.773	0.911
	I find it interesting to provide services through the TBSS system						0.956	0.052	19.699		
	I think providing services through the TBSS system is a new challenge						0.831	0.057	15.159		
Usefulness	I think the overall performance of gym operation has improved through the TBSS system						0.893	-	-	0.792	0.920
	I think it is possible to operate the gym smoothly through the TBSS system						0.861	0.056	16.820		
	I think the TBSS system is efficient for Taekwondo participants and their parents						0.872	0.053	17.280		
Ease of use	I can easily participate in the operation of the gym using the TBSS system						0.863	-	-	0.703	0.876
	I was effectively guided on how to use the TBSS system						0.829	0.067	15.221		
	I think the use of the TBSS system is generally easy						0.811	0.063	14.633		
Reliability	I think the TBSS system accurately provides guidance on the services needed to operate the academy						0.896	-	-	0.717	0.883
	I think the provision of services for the TBSS system is consistent						0.858	0.055	16.445		
	I think the TBSS system will work without a problem even if an unexpected situation occurs						0.767	0.067	13.343		
Model Fit	X ²	df	p	X ² /df	NFI	TLI	CFI	RMR	RMSEA		
	147.156	47	0.000	3.13	0.937	0.938	0.956	0.031	0.097		

Table 3. Results of CFA on single-dimensional factor.

Factors		Question					β	SE	t	AVE	CR
Perceived value	I am happy when I provide services through the TBSS system						0.836	-	-	0.742	0.963
	Using the TBSS system is fun						0.817	0.045	22.028		
	The use of the TBSS system is interesting						0.771	0.054	17.912		
	The cost of using a TBSS system is reasonable						0.849	0.073	14.766		
	Buying services from the TBSS system is a smart way of consumption						0.861	0.063	15.115		
	TBSS systems offer a variety of values at a low cost						0.838	0.068	14.445		
	TBSS systems effectively improve academy performance						0.923	0.061	17.121		
	TBSS systems contribute to gym performance and achievement						0.912	0.065	16.749		
TBSS systems have various functions						0.798	0.066	13.369			
Intention to use continuously	I will continue to use the TBSS system						0.937	-	-		
	I will increase the frequency of use of the TBSS system						0.942	0.040	25.641		
	I plan to use the TBSS system more						0.952	0.038	26.782		
Model Fit	χ^2	df	p	χ^2/df	NFI	TLI	CFI	RMR	RMSEA		
	119.558	48	0.000	2.491	0.959	0.966	0.975	0.021	0.089		

In this study, multiple regression analysis was conducted, rather than structural equation modeling (SEM), to verify the established research hypotheses. As the correlation coefficient between the constructs used in this study is relatively high, concerns about type 2 errors may be raised when performing SEM verification [41,42]. In particular, when it comes to multicollinearity in SEM, there are no specific guidelines for dealing with it in practice [43]. Nonetheless, this problem can be solved by removing variables suspected of multicollinearity or integrating variables with high correlation coefficients into one [44]. However, there is a risk of errors in model setting or distorted results [45]. Therefore, the hypotheses were verified using multiple regression analysis, and the multicollinearity problem was confirmed through the variance inflation factor (VIF) index.

3.4. Statistical Analysis

Frequency analysis, CFA, reliability analysis, Pearson's correlation analysis, and simple and multiple linear regression analysis were performed on the data collected through the online questionnaire using SPSS 27.0 and AMOS 27.0 programs (IBM Corp., Armonk, NY, USA). Statistical significance was set at $\alpha = 0.05$.

4. Results

4.1. Normality of Data and Pearson's Correlation Analysis

In this study, we first examined whether the assumptions necessary for multiple regression analysis were satisfied. First, it was determined that the data used in this study had a normal distribution after confirming the normality of the residuals using the P-P chart. Second, by inspecting the scatterplot of the residuals, it was determined that the residuals had linearity and equal variance and that the assumptions for multivariate multiple regression analysis were met. Third, as shown in Table 4, skewness ranges from -0.91 to -0.10 , and kurtosis ranges from -0.26 to 0.43 . The data analyzed in this study, which fall within the appropriate range, satisfy the normality assumption [46]. Moreover, as a result of Pearson's correlation analysis, as shown in Table 4, the correlation coefficients between variables ranged from 0.763 to 0.877 , indicating significant correlations.

Table 4. Descriptive statistics and correlation analysis.

	Enjoyment	Usefulness	Ease of Use	Reliability	Perceived Values	Intention to Use Continuously
1	1					
2	0.777 **	1				
3	0.809 **	0.863 **	1			
4	0.764 **	0.796 **	0.843 **	1		
5	0.829 **	0.855 **	0.853 **	0.862 **	1	
6	0.763 **	0.859 **	0.836 **	0.778 **	0.877 **	1
M	3.65	3.82	3.69	3.63	3.65	3.60
SD	0.96	0.85	0.89	0.87	0.81	0.86
Skewness	-0.29	-0.46	-0.37	-0.91	-0.15	-0.10
Kurtosis	-0.26	0.43	0.10	0.05	0.43	-0.20

Note. ** $p < 0.01$.

Kline and Klammer [47] argued that “a correlation coefficient between two latent constructs greater than 0.85 indicates a high correlation, indicating multicollinearity.” According to Kline [48], with a correlation of 0.90 , “it is difficult to measure the variables X and Y as separate components” [49]. The correlation coefficient between the components, set as a result of the correlation analysis, is at the boundary with respect to multicollinearity. However, to eliminate the multicollinearity problem, additional verification was performed through the VIF, and the related results are shown in Tables 5–7.

Table 5. Effect of TBSS characteristics on perceived value.

		B	SE	β	t	p	Collinearity Statistics	
							Tolerance	VIF
Perceived value	(constant)	0.276	0.111		2.490	0.014		
	Enjoyment	0.211	0.044	0.250	4.811	0.000	0.307	3.252
	Usefulness	0.281	0.058	0.294	4.862	0.000	0.228	4.388
	Ease of use	0.089	0.064	0.098	1.407	0.161	0.171	5.863
	Reliability	0.332	0.053	0.354	6.254	0.000	0.260	3.853
Adjusted $R^2 = 0.844$, $F = 254.635$ ***								

*** $p < 0.001$.

Table 6. Effect of TBSS characteristics on the intention to use continuously.

		B	SE	β	t	p	Collinearity Statistics	
							Tolerance	VIF
Intention to use continuously	(constant)	0.135	0.145		0.933	0.352		
	Enjoyment	0.109	0.058	0.118	1.902	0.059	0.307	0.3252
	Usefulness	0.497	0.076	0.474	6.563	0.000	0.228	0.4388
	Ease of use	0.236	0.083	0.237	2.839	0.005	0.171	5.863
	Reliability	0.113	0.069	0.110	1.630	0.105	0.260	3.853
Adjusted $R^2 = 0.777$, $F = 164.172$ ***								

*** $p < 0.001$.**Table 7.** Effect of perceived value on the intention to use continuously.

		B	SE	β	t	p	Collinearity Statistics	
							Tolerance	VIF
(constant)		0.211	0.145		1.456	0.147		
Perceived value		0.960	0.039	0.877	24.840	0.000	1.000	1.000
Adjusted $R^2 = 0.767$, $F = 617.044$ ***								

*** $p < 0.001$.

4.2. Effect of TBSS Characteristics of Taekwondo Academies on Perceived Value and Intention to Use Continuously

4.2.1. Effect of TBSS Characteristics of Taekwondo Academies on Perceived Value

Table 5 shows the results of the multiple regression analysis conducted to verify the effect of TBSS characteristics of Taekwondo academies on perceived value. The explanatory power of the regression equation was $R^2 = 84.4\%$, and the F statistic was 254.635 ($p < 0.001$), which is statistically significant. Among the sub-factors of TBSS characteristics, reliability ($\beta = 0.354$, $p < 0.001$), usefulness ($\beta = 0.294$, $p < 0.001$), and enjoyment ($\beta = 0.250$, $p < 0.001$) were found to have a positive (+) effect on the perceived value. However, ease of use ($\beta = 0.098$, $p = 0.161$) did not appear to affect perceived value significantly. In addition, since the correlation coefficients of all independent variables used for hypothesis testing are relatively high, the VIF was checked to confirm the absence of multicollinearity. This was satisfied, and thus, there was no problem with multicollinearity. Therefore, hypothesis 1 was partially supported.

4.2.2. Effect of TBSS Characteristics of Taekwondo Academies on the Intention to Use Continuously

Table 6 shows the results of multiple regression analysis conducted to verify the effect of TBSS characteristics of Taekwondo academies on intention to use continuously. The explanatory power of the regression equation was $R^2 = 77.7\%$, and the F statistic was 164.172 ($p < 0.001$), which is statistically significant. Among the sub-factors of TBSS characteristics, usefulness ($\beta = 0.497$, $p < 0.001$) and ease of use ($\beta = 0.236$, $p < 0.01$) had a positive (+) effect on the intention to use continuously. However, among the characteristics of TBSS, enjoyment ($\beta = 0.118$, $p = 0.059$) and reliability ($\beta = 0.110$, $p = 0.105$) did not significantly affect the intention to use continuously. In addition, since the correlation coefficients of all independent variables used for hypothesis testing are relatively high, the VIF was checked to confirm the absence of multicollinearity. This was satisfied, and thus, there was no multicollinearity problem. Therefore, hypothesis 2 was partially supported.

4.2.3. Effect of Perceived Value of Taekwondo Academies on the Intention to Use Continuously

Table 7 shows the results of the multiple regression analysis conducted to verify the effect of the perceived value of Taekwondo academies on the intention to use continuously. The explanatory power of the regression equation was $R^2 = 76.7\%$, and the F statistic was

617.044 ($p < 0.001$), which is statistically significant. Perceived value positively affected the intention to use continuously ($\beta = 0.877$, $p < 0.001$). In addition, since the correlation coefficients of all independent variables used for hypothesis testing are relatively high, the VIF was checked to confirm the absence of multicollinearity. This was satisfied, and thus, there was no multicollinearity problem. Therefore, hypothesis 3 was supported.

5. Discussion

When the effect of TBSS characteristics of Taekwondo academies on perceived value was examined, it was found to have a positive effect on reliability, usefulness, and enjoyment in descending order. However, there is no previous research on TBSS from Taekwondo academies' perspective, so it is difficult to compare the results of this study directly. Despite this limitation, the following discussion is developed, centering on the results of TBSS characteristics and perceived values.

First, among TBSS characteristics, enjoyment positively affected perceived value. According to Seong [50], the enjoyment due to TBSS at a golf course, a sports facility similar to a Taekwondo academy, positively affected perceived value. Enjoyment tends to reduce the psychological cost or burden involved in producing and delivering services [51]. Therefore, it is necessary to use gamification to solidify records and work performance [52]. These efforts have the potential to reduce the psychological burden of TBSS from TBSS users (Taekwondo masters) to inmates (trainees' parents) while also increasing perceived value through enjoyment.

Second, among TBSS characteristics, usefulness had a positive effect on perceived value. Recently, digitalization has been accelerating in society because of advances in science and technology and COVID-19 [53]. The use of TBSS in various fields is growing as the non-face-to-face environment becomes more common. Taekwondo masters oversee Taekwondo education, admission counseling, and management of Taekwondo academy simultaneously. TBSS saves time and effort by making it possible to process work quickly and conveniently. Therefore, technology can have a positive influence by supporting the management activities of Taekwondo academies. As a result, the rising demand for TBSS in a variety of fields, including Taekwondo academies, can be interpreted as an increase in TBSS's perceived value. In a pandemic situation like COVID-19, these findings are expected to increase usage intention.

Third, among TBSS characteristics, ease of use did not appear to affect perceived value. Masters of Taekwondo academies may prefer to contact children's parents directly or respond immediately instead of using TBSS and may choose to distribute tasks among existing staff. In addition, some of the Taekwondo masters who are older or endure some inconvenience in using the new functions of TBSS are affecting its perceived value. However, TBSS, which can establish management and education strategies in delivering and accepting new information, is increasing its perceived value because it provides simple and quick support for routine tasks that frequently occur in a Taekwondo academy. Ease of use does not affect the perceived value. However, Taekwondo masters are willing to continue using TBSS for its convenience and advantages beyond positive value recognition. These advantages, rather than the time Taekwondo masters spend running Taekwondo academies, can improve education quality. Therefore, TBSS can be used as one element necessary to improve and achieve Taekwondo academies' performance. TBSS also promotes goal accomplishment and other significant achievements, such as physical and mental health. Thus, TBSS and Taekwondo education quality improvement must be pursued together.

Fourth, among TBSS characteristics, reliability positively affected perceived value. The basic trust that the Taekwondo master who runs the Taekwondo academy will assist with management activities is aided by the technology they selected from among various smart solutions supporting business activities. The repeated use of these skills required in the management of Taekwondo academies depicts that trust in the characteristics of TBSS could increase their perceived value. Every day, Korea generates a massive amount of data

based on a fast and powerful network [54–57] and is extremely sensitive to change. As a result, continuous TBSS updates are required to increase the trust of rapidly changing users.

Among the characteristics of TBSS, usefulness and ease of use were found to have a positive effect on the intention to use continuously. According to several studies, usefulness and ease of use positively affected behavioral intention [58,59]. A positive attitude toward TBSS can significantly affect the intention to use it [60]. In other words, a positive evaluation of TBSS helps to maintain a smooth relationship with consumers [61]. Therefore, among the characteristics of TBSS, usefulness, and ease of use enhance perceived value more strongly than enjoyment and reliability. Therefore, when developing TBSS for Taekwondo academies, it is necessary to develop content with improved usability and ease, considering the age and characteristics of users. However, among the characteristics of TBSS, enjoyment and reliability did not significantly affect the intention to use it continuously. Despite TBSS being commonly used in Taekwondo academies, its purpose is related to the level of managing trainees, that is, work, rather than pursuing enjoyment. In addition, Taekwondo masters who do not prefer TBSS or are unfamiliar with its use may believe that paper distribution methods such as telephone or postal mail are more effective than TBSS. Therefore, it is necessary to attempt a comparative analysis of the use and non-use of TBSS in Taekwondo academy management.

Finally, the perceived value of TBSS was found to positively affect the intention to use it continuously. According to several studies [62,63], the perceived value influences the intention to use continuously, supporting the results of this study. The perceived value of TBSS in reducing costs and time incurred by Taekwondo masters in the management process is ultimately beneficial to business activities. Thus, Taekwondo masters try to use it consistently. Therefore, technological improvement is required to increase the intention of continuous use and enhance the perceived value of TBSS. In addition, these technological improvements of Taekwondo TBSS should be secured in terms of ease of use and usefulness.

6. Conclusions

As the TBSS characteristics of Taekwondo academy positively affect perceived values of reliability, usefulness, and enjoyment, it is necessary to strengthen a stable service environment and provide interesting and valuable services. In addition, as usefulness and ease are derived as factors affecting the intention of continuous use, the TBSS provider is required to improve the user-friendly system. Our study provides practical implications for more efficient use of the TBSS provided by a Taekwondo academy by discovering the relationship between the TBSS configuration of the Taekwondo academy, perceived value, and intention to use continuously.

These findings are practical achievements related to TBSS in Taekwondo management, and these results can be applied not only to Taekwondo academies in Korea. Therefore, when TBSS-related services are expanded and the current situation is considered, the results of this study can be utilized for follow-up studies.

Nonetheless, this study has certain limitations. First, although the number of samples was calculated and sampled by a scientific method, various characteristics (female and elderly) of the study participants could not be investigated due to the limitations of the online survey. Second, this study guided TBSS through pictures and collected data using an online survey owing to the COVID-19 pandemic. In this process, it cannot be excluded that some respondents have a bias toward TBSS. In addition, although the order of the questions was set to be random, there is concern regarding common method bias because the survey was conducted at the same time. Third, due to the high correlation between constructs, this study, as a basic study for the application of TBSS in Taekwondo academies, focused on the direct influence relationship through regression analysis. Moreover, it is limited in not being able to consider various variables that can affect the perceived value of TBSS. In the follow-up study, it is necessary to investigate the characteristics of various TBSS that can influence the management of private institutes by supplementing these limitations.

Author Contributions: Conceptualization, D.-K.K., N.-H.K. and S.-U.P.; methodology, D.-K.K.; software, D.-K.K.; validation, D.-K.K.; formal analysis, D.-K.K.; investigation, D.-K.K., N.-H.K., C.-Y.O. and S.-U.P.; data curation, D.-K.K., N.-H.K., C.-Y.O. and S.-U.P.; writing—original draft preparation, D.-K.K. and N.-H.K.; writing—review and editing, D.-K.K., N.-H.K., C.-Y.O., J.J., H.N. and S.-U.P.; visualization, D.-K.K., N.-H.K., C.-Y.O. and S.-U.P.; supervision S.-U.P.; project administration D.-K.K., N.-H.K. and S.-U.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of Kyung Hee University Global Campus-designated institutional bioethics committee (KHGIRB-22-214).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Acknowledgments: The authors express their sincere gratitude to all study participants.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Jeon, H.A.; Kim, K.A.; Kim, S.H. The effects of customer's relational benefits on continuous usage intention of technology-based self-service: Focusing on types of technology-based self-service. *J. Mark. Manag. Res.* **2018**, *23*, 27–49. [CrossRef]
2. Meuter, M.L.; Ostrom, A.L.; Roundtree, R.I.; Bitner, M.J. Self-service technologies: Understanding customer satisfaction with technology-based service encounters. *J. Mark.* **2000**, *64*, 50–64. [CrossRef]
3. Dabholkar, P.A. Incorporating choice into an attitudinal framework: Analyzing models of mental comparison processes. *J. Con. Res.* **1994**, *21*, 100–118. [CrossRef]
4. Payne, A.F.; Storbacka, K.; Frow, P. Managing the co-creation of value. *J. Acad. Mark. Sci.* **2008**, *36*, 83–96. [CrossRef]
5. Fortune Business Insight. Kiosk Market Size, Share & COVID-19 Impact Analysis, by Type, by Industry, and Regional Forecast. pp. 2021–2028. Available online: <https://www.fortunebusinessinsights.com/industry-reports/kiosks-market-101374> (accessed on 22 October 2022).
6. Berry, L.L.; Lampo, S.K. Teaching an old service new tricks: The promise of service redesign. *J. Serv. Res.* **2000**, *2*, 265–275. [CrossRef]
7. Cho, S.H. The Effect of Self-Service Technology (SST) Quality on Customer Satisfaction: The Mediating Effect of Experience Value of SST Users. Master's Thesis, Sejong University, Seoul, Republic of Korea, 2015.
8. Lin, J.C.; Hsieh, P.L. Assessing the self-service technology encounters: Development and validation of SSTQUAL scale. *J. Retail.* **2011**, *87*, 194–206. [CrossRef]
9. Jung, H.C.; Song, J.K. Decreased abdominal fat and improved bone metabolism after taekwondo training in obese adolescents. *Kinesiology* **2018**, *50*, 79–88. [CrossRef]
10. Kukkiwon. Statistics and Policy Data. Available online: <https://www.kukkiwon.or.kr/front/kor/information/report.action?cmd=View&seq=294&pageNum=1&searchKey=1&searchVal> (accessed on 22 October 2022).
11. Seo, Y.W. The relationship among emotional labor, job stress, and job satisfaction of Taekwondo masters. *Korean J. Sport Sci.* **2019**, *28*, 3021–3093. [CrossRef]
12. World Taekwondo Academy. Conditions for Application by Course in 2022 in Korea. Available online: <http://wta.kukkiwon.or.kr/kr/trainingProcess/list?menuid=75&topMenuid=71> (accessed on 29 November 2022).
13. Kim, D.H.; Jeong, K.H.; Kim, H.Y. Korean taekwondo gyms' use of marketing communications and business strategy through social networking services. *Int. Symp. Taekwondo Stud.* **2017**, *2017*, 210–212.
14. Lee, S.L.; Kim, J.M. Influence of Utilizing SNS characteristics necessary for communication with parents at taekwondo school on consumer behavior. *Korean Soc. Sport Sci.* **2016**, *25*, 713–726.
15. Lee, J.H.; Kim, T.H. Effect of SNS use at taekwondo gyms on training satisfaction and intention to continue training. *The Korea J. Sports Sci.* **2018**, *27*, 599–610. [CrossRef]
16. Dabholkar, P.A. Consumer evaluations of new technology-based self-service options: An investigation of alternative models of service quality. *Int. J. Res. Mark.* **1996**, *13*, 29–51. [CrossRef]
17. Dabholkar, P.A.; Bagozzi, R.P. An attitudinal model of technology-based self-service: Moderating effects of consumer traits and situational factors. *J. Acad. Mark. Sci.* **2002**, *30*, 184–201. [CrossRef]
18. Curran, J.M.; Meuter, M.L. Self-service technology adoption: Comparing three technologies. *J. Serv. Mark.* **2005**, *19*, 103–113. [CrossRef]
19. Kang, J.W.; Namkung, Y. Classifying quality attributes of self-service kiosk in the restaurant industry using Kano model. *Korean J. Hosp. Tourism.* **2018**, *27*, 263–279. [CrossRef]
20. Globerson, S.; Maggard, M.J. A conceptual model of self-service. *Int. J. Oper. Prod. Manag.* **1991**, *11*, 33–43. [CrossRef]
21. Parasuraman, A. Service Quality and productivity: A synergistic perspective. *Manag. Serv. Qual.* **2002**, *12*, 6–9. [CrossRef]

22. Zeithaml, V.A. Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *J. Mark.* **1988**, *52*, 2–22. [\[CrossRef\]](#)
23. Wang, Y.S.; Wang, Y.M.; Lin, H.H.; Tang, T.I. Determinants of user acceptance of internet banking: An empirical study. *Int. J. Serv. Ind. Manag.* **2003**, *14*, 501–519. [\[CrossRef\]](#)
24. Lee, K.H.; Nam, K.Y. The effect of service convenience on perceived value, adoption, innovation resistance and behavior intention in food delivery application. *J. Foodserv. Manag. Soc. Korea* **2019**, *22*, 171–194.
25. Pizam, A.; Calantone, R. Beyond psychographics-values as determinants of tourist behavior. *Int. J. Hosp. Manag.* **1987**, *6*, 177–181. [\[CrossRef\]](#)
26. Bolton, R.N.; Drew, J.H. A longitudinal analysis of the impact of service changes on customer attitudes. *J. Mark.* **1991**, *50*, 10–28. [\[CrossRef\]](#)
27. Wu, G. Perceived interactivity and attitude toward web sites. In Proceedings of the 1999 Annual Conference of American Academy of Advertising, Albuquerque, NM, USA, 26 March 1999; pp. 254–262.
28. Berthon, P.; Pitt, L.F.; Watson, R.T. The World Wide Web as an advertising medium. *J. Advert. Res.* **1996**, *36*, 43–54.
29. Lee, S.H. The structural relationship between the characteristics of technology-based self-service (TBSS) system of food service industry, consumer confidence and sustainable usage intention: Focusing on the kiosk ordering system. *J. Foodserv. Manag.* **2020**, *23*, 149–174.
30. Meuter, M.L.; Bitner, M.J.; Ostrom, A.L.; Brown, S.W. Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *J. Mark.* **2005**, *69*, 61–83. [\[CrossRef\]](#)
31. Kuo, Y.F.; Wu, C.M.; Deng, W.J. The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services. *Comput. Hum. Behav.* **2009**, *25*, 887–896. [\[CrossRef\]](#)
32. Jeong, B.G. The effects of technology-based self-service on perceived value experience and revisit intention in Korean style restaurants. *J. Food Serv. Ind.* **2020**, *16*, 35–51.
33. Kang, H. Sample size determination for repeated measures design using G Power software. *Anesth. Pain Med.* **2015**, *10*, 6–15. [\[CrossRef\]](#)
34. Seiders, K.; Voss, G.B.; Godfrey, A.L.; Grewal, D. SERVCON: Development and validation of a multidimensional service convenience scale. *J. Acad. Mark. Sci.* **2007**, *35*, 144–156. [\[CrossRef\]](#)
35. Sweeney, J.C.; Soutar, G.N.; Johnson, L.W. The role of perceived risk in the quality-value relationship: A study in a retail environment. *J. Retail.* **1999**, *75*, 77–105. [\[CrossRef\]](#)
36. Sweeney, J.C.; Soutar, G.N. Consumer perceived value: The development of a multiple item scale. *J. Retail.* **2001**, *77*, 203–220. [\[CrossRef\]](#)
37. Bhattacharjee, A. Understanding information systems continuance: An expectation-confirmation model. *MIS Q.* **2001**, *25*, 351–370. [\[CrossRef\]](#)
38. Kwon, H.H.; Trail, G.T. A reexamination of the construct and concurrent validity of the psychological commitment to team scale. *Sport Mark. Q.* **2003**, *12*, 88–93.
39. Fornell, C.; Larcker, D.F. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* **1981**, *18*, 39–50. [\[CrossRef\]](#)
40. Nunnally, J.C.; Bernstein, I.H. *Psychometric Theory*, 3rd ed.; McGraw-Hill Inc: New York, NY, USA, 1994.
41. Jagpal, H.S. Multicollinearity in structural equation models with unobservable variables. *J. Mark. Res.* **1982**, *19*, 431–439. [\[CrossRef\]](#)
42. Grapentine, T. Path analysis vs. structural equation modeling. *Mark. Res.* **2000**, *12*, 12–20.
43. Grewal, R.; Cote, J.A.; Baumgartner, H. Multicollinearity and measurement error in structural equation models: Implications for theory testing. *Mark. Sci.* **2004**, *23*, 519–529. [\[CrossRef\]](#)
44. Niemelä-Nyrhinen, J.; Leskinen, E. Multicollinearity in marketing models: Notes on the application of ridge trace estimation in structural equation modelling. *Electron. J. Bus. Res. Methods* **2014**, *12*, 3–15.
45. Kwon, S. Exploring a way to overcome multicollinearity problems by using hierarchical construct model in structural equation model. *J. Inf. Technol. Appl. Manag.* **2015**, *22*, 149–169.
46. West, S.G.; Finch, J.F.; Curran, P.J. Structural equation models with non-normal variables: Problems and remedies. In *Structural Equation Modeling: Concepts, Issues, and Applications*; Hoyle, R.H., Ed.; Sage: Thousand Oaks, CA, USA, 1995; pp. 56–75.
47. Kline, T.J.; Klammer, J.D. Path model analyzed with ordinary least squares multiple regression versus LISREL. *J. Psychol.* **2001**, *135*, 213–225. [\[CrossRef\]](#)
48. Kline, R.B. *Principles and Practice of Structural Equation Modeling*; The Guilford Press: New York, NY, USA, 2010.
49. Hilkenmeier, F.; Bohndick, C.; Bohndick, T.; Hilkenmeier, J. Assessing Distinctiveness in Multidimensional Instruments Without Access to Raw Data—A Manifest Fornell-Larcker criterion. *Front. Psychol.* **2020**, *11*, 223. [\[CrossRef\]](#) [\[PubMed\]](#)
50. Seong, G.H. The Impact of Golf Players Perceived No-Caddy Service Factors on Experiential Value, Customer Satisfaction and Revisit Intention. Ph.D. Dissertation, Kyung Hee University, Seoul, Republic of Korea, 2021.
51. Baker, T.; Murthy, N.N.; Jayaraman, V. Service package switching in hotel revenue management systems. *Decis. Sci.* **2002**, *33*, 109–132. [\[CrossRef\]](#)
52. Gerdenitsch, C.; Sellitsch, D.; Besser, M.; Burger, S.; Stegmann, C.; Tscheligi, M.; Kriglstein, S. Work gamification: Effects on enjoyment, productivity and the role of leadership. *Electron. Comm. Res. Appl.* **2020**, *43*, 100994. [\[CrossRef\]](#)

-
53. Ting, D.S.W.; Carin, L.; Dzau, V.; Wong, T.Y. Digital technology and COVID-19. *Nat. Med.* **2020**, *26*, 459–461. [[CrossRef](#)] [[PubMed](#)]
 54. Shin, D. A socio-technical framework for Internet-of-Things design: A human-centered design for the Internet of Things. *Telemat. Inform.* **2014**, *31*, 519–531. [[CrossRef](#)]
 55. Shin, D.H. Demystifying big data: Anatomy of big data developmental process. *Telecomm. Policy* **2016**, *40*, 837–854. [[CrossRef](#)]
 56. Park, S.U.; Ahn, H.; Kim, D.K.; So, W.Y. Big data analysis of sports and physical activities among Korean adolescents. *Int. J. Environ. Res. Public Health* **2020**, *17*, 5577. [[CrossRef](#)]
 57. Park, S.U.; Jeon, J.W.; Ahn, H.; Yang, Y.K.; So, W.Y. Big data analysis of the key attributes related to stress and mental health in Korean Taekwondo student athletes. *Sustainability* **2022**, *14*, 477. [[CrossRef](#)]
 58. Jo, M.N.; Cha, J.B. Consumer attitudes and behavioral intentions on delivery application quality: Focusing on technology acceptance model (TAM). *J. Tourism Sci.* **2017**, *41*, 171–184. [[CrossRef](#)]
 59. Kim, M.; Qu, H. Travelers' behavioral intention toward hotel self-service kiosks usage. *Int. J. Contemp. Hosp. Manag.* **2014**, *26*, 225–245. [[CrossRef](#)]
 60. Curran, J.M.; Meuter, M.L.; Surprenant, C.F. Intentions to use self-service technologies: A confluence of multiple attitudes. *J. Serv. Res.* **2003**, *5*, 209–224. [[CrossRef](#)]
 61. Beatson, A.; Coote, L.V.; Rudd, J.M. Determining consumer satisfaction and commitment through self-service technology and personal service usage. *J. Mark. Manag.* **2006**, *22*, 853–882. [[CrossRef](#)]
 62. Kim, M.J. A Study on the Continuance Intention of Delivery Application Service in the Food Industry: Based on Integrated Perspective of Value-Based Adoption Model and Resistance Factors. Ph.D. Dissertation, Kyung Hee University, Seoul, Republic of Korea, 2017.
 63. Hur, K.-S.; Choi, S.-R. Factors affecting the continuous intentions to use fast food franchise TBSS: Based on the value-based adoption model. *J. Tour. Leis. Res.* **2022**, *34*, 207–224. [[CrossRef](#)]