Research on Intentional Behavior of Chinese College Students Using Running Sports Applications (FCR) Based on UTAUT

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Abstract

Background and Aim: This study addresses the research gap in the mandatory use of campus sports running applications by college students in southern China. It provides reference for the design and configuration of course tools to enhance the Flashing Campus Operation Application (FCR) in the future.

FCR is a mobile application that college students in Zhejiang Province must use to meet their physical education course requirements. It helps educators monitor students' exercise behavior data. However, the analysis of students' perceived intentions and behaviors towards FCR usage is insufficient. Further research is needed to understand the experiences related to FCR and continuously improve its effectiveness.

Materials and Methods: A model was developed based on UTAUT2 as the core theory and combined with previous research frameworks. An online survey was conducted using Tencent's questionnaire tool, collecting data from 350 first-year to fourth-year undergraduate students from three universities in southern Zhejiang Province, China. Under mandatory situations, they use flashing campus applications to complete school sports running courses. Descriptive statistics and structural equation modeling are used for hypothesis testing in data analysis.

Results: (1) Perceived ease of use (PEOU) and performance expectations (PE) have no significant positive impact on behavioral intention. The facilitating conditions (FC) have no significant positive effect on continuous use behavior (CUB). (2) Perceived usefulness (PU), perceived enjoyment (PJ), and autonomous motivation (AM) have a significant positive impact on behavioral intention (BI) and continuous use behavior (CUB). (3) In addition, the perceived ease of use and performance expectations of using FCR in a mandatory situation did not have a significant mediating effect on continuous use behavior through behavioral intention. Perceived usefulness, perceived enjoyment, and autonomous motivation have a significant mediating effect on continuous use behavior through behavioral intention.

Conclusion: The research results support hypotheses Ha2, Ha3, Ha5, and Ha7, while hypotheses Ha1, Ha4, and Ha6 are not supported. The research results can be summarized into three aspects: (1) Perceived usefulness, perceived, and autonomous motivation are important factors affecting students' intention to use FCR behavior; It has indirectly had a significant impact on sustained usage behavior. (2) Perceived usability and performance expectations have no significant impact on students' behavioral intentions, and they cannot indirectly affect continuous usage behavior. This indicates that in mandatory situations, perceived ease of use and performance expectations may not be the main factors significantly influencing behavioral intentions. (3) Facilitating conditions are not an important factor affecting sustained usage behavior. This indicates that in a specific context, organizational support and resource availability are not the primary factors influencing sustained usage behavior, or their impact may be overshadowed by other factors.

Keywords: College Students; School Physical Education; Sports Running Mobile Applications; UTAUT2; FCR

Introduction

The sports apps are widely used to improve exercise habits and manage health, playing a vital role in reducing global obesity levels and medical costs. Gowin et al. (2015) surveyed college fitness apps to explore how American students use health and fitness apps to change their physical activity habits. Liu (2023) proposed that the use of sports apps significantly improved college students' sports psychology and physical health, providing a new perspective for physical education reform, enabling students to exercise independently under scientific guidance (Ben et al., 2022). The Ministry of Education of China has vigorously promoted the use of running course tools to become an important tool for college students to complete running courses. At present, there is only research (Guo, 2022) on the mandatory use of school running apps by Chinese college students.

The Flashing Campus Running Application (FCR) is a tool for Southern Chinese university students to complete running courses. This study used questionnaire surveys and quantitative analysis

to randomly survey 350 undergraduate students aged 20-23 from three universities in Zhejiang Province. It aims to assist researchers and educational administrators in verifying seven hypothesized research objectives regarding the behavioral intention and sustained use behavior of FCR under mandatory circumstances. This survey will help identify issues in the use of FCR and improve tool efficiency. Help college students better experience campus running courses and enhance their positive exercise awareness. This provides a reference for the design and improvement of physical education curriculum tools.

Objectives

To make up for the shortcomings of previous studies, referring to Guo (2022)'s research results on college students in northern China, this study uses the UTAUT and SDT theoretical models to explain the behavioral intention and continued use behavior of college students in Zhejiang Province, southern China when using a campus running application (FCR) under mandatory circumstances. This study will further extend these studies to understand the behavioral intention and continued use behavior of college students in the south using campus running applications. Replace the expected effort factor with perceived ease of use and usefulness; ignore the social influence factor; retain the performance expectation factor; add the perceived enjoyment factor, and observe the impact of autonomous motivation on behavioral intention and continued use behavior. The final theoretical model developed in this study explains the significant factors that affect the behavioral intention and continued use behavior of college students in Zhejiang Province, China, under mandatory circumstances, explaining the sample of college students from southern China using campus running applications.

Literature Review

In many previous studies, the UTAUT theory has been used to analyze the impact of the population's use of sports and fitness apps. Chaloupsky et al. (2019) proposed that the use of tracking apps in running courses can improve student motivation, thereby increasing enrollment rates and reducing dropout rates. Meng (2021)'s research showed that the use of running apps on campus can effectively increase the time and frequency of students' extracurricular exercise by calculating the frequency of students using running apps. Liu (2023) used big data and deep learning models to develop a student behavior analysis system to gain in-depth insights into students' physical activities, improve the effectiveness of running programs, provide quantitative data support for student management, and promote more personalized and effective campus running courses. There are a large number of self-downloadable sports and fitness apps on the Internet worldwide. However, due to the lack of effective self- and environmental monitoring mechanisms, young people are unable to actively or continuously use these sports apps, which still causes health problems for most college students due to a lack of exercise. If people know that they are being observed and evaluated during exercise, they are more likely to work harder for a longer period. To this end, China's education administration has promoted the mandatory use of running apps in university campus environments to monitor college students' running behavior while studying at school, to achieve the goal of improving exercise health in school physical education courses.

At present, most universities in southern China use FCR as an important tool to monitor the achievement of college students' running course goals and promote exercise, to encourage more students to develop the habit of actively participating in sports. Since FCR is a mandatory tool to achieve the goals of campus operation courses, the final data results of FCR are used as an important part of students' physical education course grades. For students, running with FCR has become a passive rather than voluntary activity. In the context of mandatory use, what is the perceived experience of students? Do they enjoy the process of using FCR? Do they feel the effectiveness of FCR? Is the continued use of FCR tools due to autonomous motivation? We lack research and answers to this series of questions. This means that we do not understand the significance of students' perceived enjoyment, performance expectations, and

autonomous motivation in affecting campus running behavior, as well as the significant factors that affect their continued use of FCR. Based on previous research, a conceptual framework was created (as shown in Figure 1), which included six independent variables: perceived ease of use, perceived usefulness, performance expectations, perceived enjoyment, facility conditions, and autonomous motivation; 1 mediating variable: behavioral intention, and 1 dependent variable: continued use behavior. Based on the variables of the research model, seven causal hypothesis verification factors were proposed to identify the factors with significant influence.
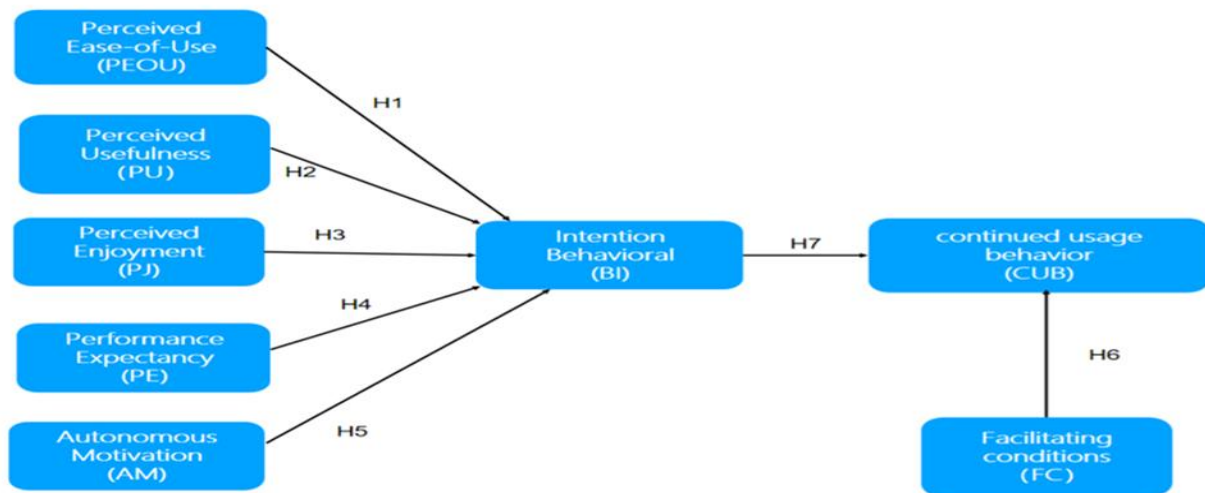

Figure 1 Conceptual framework of the study

Hypotheses

Hypotheses	Statement	Literature Support
$H_0 1$	Perceived Ease Of Use does not significantly influence behavioral intention.	Davis (1989) Venkatesh (2003)
$H_a 1$	Perceived Ease Of Use significantly influences behavioral intention.	
$H_0 2$	Perceived Usefulness does not significantly influence behavioral intention.	Vinnikova et al. (2020)
$H_a 2$	Perceived Usefulness significantly influences behavioral intention.	
$H_0 3$	Perceived Enjoyment does not significantly influence behavioral intention.	Bai (2022) Chao (2019)
$H_a 3$	Perceived Enjoyment significantly influences behavioral intention.	
$H_0 4$	Performance Expectancy does not significantly influence behavioral intention.	Bai (2022) Chao (2019)
$H_a 4$	Performance Expectancy significantly influences behavioral intention.	
$H_0 5$	Autonomous motivation does not significantly influence behavioral intention.	Guo (2022)

Hypotheses	Statement	Literature Support
H$_a$5	Autonomous motivation significantly influences behavioral intention.	
H$_0$6	Facilitating conditions do not significantly influence continuance usage behavior.	Hoque & Sorwar (2017)
H$_a$6	Facilitating conditions significantly influence continuance usage behavior.	Bai (2022)
H$_0$7	Behavioral intention does not significantly influence continued use behavior.	Vinnikova et al. (2020)
H$_a$7	Behavioral intention significantly influences continuance usage behavior.	Bai (2022) Venkatesh (2012)

Methodology

This study takes UTAUT2 as the core theory and establishes a research theoretical model based on the first three theoretical frameworks. Based on the mature questionnaire items of previous researchers, a 29-item questionnaire was created, and the item-objective consistency (IOC) and Cronbach's Alpha were used to eliminate invalid items to ensure the validity of the questionnaire content. The teachers of the 1-4 undergraduate group will distribute it online to the corresponding grade group, and the students in the group will fill it out randomly and voluntarily. The questionnaire collection period is one month, and each ID can only be filled out once. All data does not involve the personal information or privacy of the research sample and complies with research ethical procedures. The questionnaire collected data from 350 undergraduates (152 boys and 198 girls). Data analysis used Jamovi statistical software through descriptive statistics, confirmatory factor analysis (CFA), and structural equation modeling (SEM) to test the seven hypothesized relationships between perceived ease of use, perceived usefulness, performance expectations, perceived enjoyment, facility conditions, autonomous motivation, behavioral intention, and continued use behavior.

Sample Characteristics

The research subjects were undergraduate students from Zhejiang Province, China. Zhejiang Province is a coastal region in China with a developed economy and Internet information technology. FCR, as a new information technology product, is different from the previous research tool on the use of sports applications by college students in northern China (Guo, 2022). The FCR tool in this study uses AI technology to enhance the experience. There are 109 universities in Zhejiang Province, and the research focuses on three well-known public universities in the fields of medicine, education, and comprehensive education, representing the eastern, central, and southern regions of Zhejiang Province (Table 1). The sample was first- to fourth-year college students aged between 18 and 23 years old, who had an average of more than six months of experience in using FCR (Table 2). The use of FCR as a technology tool for physical education courses is consistent with the common characteristics of the target population of the study.

The sample of this study may not be generalizable, and the results only reflect the specific characteristics or views of the respondents in Zhejiang Province in southern China. The acceptance and use of FCR may be affected by the different genders, cultural backgrounds, and social upbringings of college students, and these factors have not been fully considered.

Table 1 The Number of Target Population in Zhejiang, China

Universities	College type	Undergraduates	Representative Region
UniversityA	Public medical	21,000	Central and Eastern Zhejiang
UniversityB	Public education	26,100	Core of Western Zhejiang
UniversityC	Public comprehensive	23,300	Core of Southern Zhejiang

Universities	College type	Undergraduates	Representative Region
Total		**70,400**	**Representing Zhejiang Province**

Table 2 Demographic Information of Samples

Variable	Category	Frequency	Percentage
Gender	Male	152	43.4%
	Female	198	56.6%
	Total	**350**	**100%**
Year of Study	Year 1	96	27.4%
	Year 2	71	20.3%
	Year 3	135	38.6%
	Year 4	48	13.7%
	Total	**350**	**100%**

Research Instrument

The minimum sample size for this study was 256, which was obtained through the sample size calculator. The questionnaire used a five-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree". As shown in Table 3, all questionnaire items were derived from mature research. The content validity of the scale items was determined by a panel of three experts using the item-objective consistency index (IOC) method (Sireci, 1998). Invalid items were excluded to determine the final 29 questionnaire items. To determine the reliability of the internal consistency of the questionnaire, Cronbach's alpha was calculated based on 72 pre-test questionnaires, and the alpha levels of all questionnaires were ≥0.700 (Dunn et al., 2014). Table 4 shows that the reliability of the research questionnaire is satisfactory.

Table 3 Research Instrument Development

Variables	Item Number	Source
Perceived Ease Of Use (PEOU)	1-3	(Vinnikova et al., 2020)
Perceived Usefulness (PU)	4-7	(Vinnikova et al., 2020)
Perceived Enjoyment (PJ)	8-10	(Chao,2019)
Performance Expectations (PE)	11-14	(Chao,2019)
Autonomous motivation (AM)	15-19	(Guo,2022)
Facilitating conditions (FC)	20-22	(Hoque & Sorwar, 2017)
Behavioral Intention(BI)	23-25	(Vinnikova et al., 2020)
Continuous Use Behavior(CUB)	26-29	(Venkatesh,2012) (Yuan& MA,2014)

Table 4 Results of Cronbach's Alpha of the research instruments

Variable	Number of Items	Cronbach's Alpha	Strength of Association
Perceived Ease Of Use (PEOU)	3	0.941	Excellent
Perceived Usefulness (PU)	4	0.963	Excellent
Perceived Enjoyment (PJ)	3	0.978	Excellent
Performance Expectations (PE)	4	0.972	Excellent
Autonomous Motivation (AM)	5	0.960	Excellent
Facilitating Conditions (FC)	3	0.942	Excellent
Behavioral Intention(BI)	3	0.985	Excellent

Variable	Number of Items	Cronbach's Alpha	Strength of Association
Continuous Use Behavior(CUB)	4	0.961	Excellent

Result

Table 5 Descriptive statistics of all variables

Variables	Number of items	Mean	SD	Interpretation
Perceived Ease of Use	1-3	3.925	1.092	Agree
Perceived Usefulness	4-7	3.480	1.237	Neutral
Perceived Enjoyment	8-10	3.038	1.374	Neutral
Performance Expectancy	11-14	3.487	1.213	Neutral
Autonomous motivation	15-19	3.298	1.312	Neutral
Facilitating conditions	20-22	3.628	1.175	Agree
Behavioral Intention	23-25	3.050	1.388	Neutral
Continuous Use Behavior	26-29	2.897	1.422	Neutral

Table 5 shows the number of items, mean, standard deviation (SD), and explanation of each variable. (1) The mean of PEOU is 3.925 and the standard deviation is 1.092, indicating that most respondents have a positive attitude towards ease of use, which is interpreted as "agree". (2) The mean of PU is 3.480 and the standard deviation is 1.237, which is interpreted as "neutral". (3) The mean of PJ is 3.038 and the standard deviation is 1.374, which is interpreted as "neutral". (4) The mean of PE is 3.487 and the standard deviation is 1.213, which is interpreted as "neutral". (5) The mean of AM is 3.298, and the standard deviation is 1.312, which is interpreted as "neutral". (6) The mean of FC is 3.628 and the standard deviation is 1.175, which is interpreted as "agree". (7) The mean of BI is 3.050 and the standard deviation is 1.388, which is interpreted as "neutral". (8) The mean value of CUB is 2.897, and the standard deviation is 1.422, which is interpreted as "neutral".

Table 6 Confirmatory factor analysis

Factor	Indicator	Estimate	SE	β	z	p	CR (>.7)	AVE (>.5)
PEOU	PEOU_01	1.000	0.000	0.892			0.888	0.777
	PEOU_02	1.015	0.027	0.905	38.086	<.001		
	PEOU_03	0.949	0.028	0.846	33.313	<.001		
PU	PU_01	1.000	0.000	0.848			0.911	0.766
	PU_02	1.001	0.029	0.848	34.369	<.001		
	PU_03	1.096	0.027	0.929	41.328	<.001		
	PU_04	1.030	0.026	0.873	39.819	<.001		
PJ	PJ_01	1.000	0.000	0.888			0.899	0.812
	PJ_02	1.062	0.026	0.944	40.649	<.001		
	PJ_03	0.979	0.024	0.869	40.347	<.001		
PE	PE_01	1.000	0.000	0.795			0.885	0.718
	PE_02	1.143	0.032	0.910	36.092	<.001		
	PE_03	1.164	0.037	0.926	31.664	<.001		
	PE_04	0.937	0.041	0.745	22.940	<.001		
AM	AM_01	1.000	0.000	0.726			0.913	0.730
	AM_02	1.165	0.032	0.846	35.889	<.001		
	AM_03	1.106	0.036	0.803	30.721	<.001		

Factor	Indicator	Estimate	SE	β	z	p	CR (>.7)	AVE (>.5)
	AM_04	1.222	0.039	0.887	31.107	< .001		
	AM_05	1.275	0.039	0.926	32.522	< .001		
	AM_06	1.267	0.038	0.920	32.963	< .001		
FC	FC_01	1.000	0.000	0.820			0.856	0.743
	FC_02	1.147	0.054	0.941	21.428	< .001		
	FC_03	0.999	0.048	0.819	20.775	< .001		
BI	BI_01	1.000	0.000	0.902			0.935	0.878
	BI_02	1.072	0.015	0.967	73.395	< .001		
	BI_03	1.059	0.013	0.955	81.930	< .001		
CUB	CUB_01	1.000	0.000	0.958			0.938	0.887
	CUB_02	1.003	0.011	0.961	92.566	< .001		
	CUB_03	0.972	0.012	0.932	83.850	< .001		
	CUB_04	0.935	0.015	0.896	63.473	< .001		

Based on the data obtained from the analysis, all of the constructs had the AVE values ranging from.718 (PE) up to.878 (IB). All of the values were greater than the cut-off value of.5, this could indicate that all of the constructs passed the convergent validity. Furthermore, the composite reliability (CR) also showed at the satisfactory level since all of them are greater than the .80.

Table 7 Discriminant Validity

	1		2		3		4		5		6		7		
1. PEOU	**0.777**														
2. PU	0.743	***	**0.766**												
3. PJ	0.494	***	0.487	***	**0.812**										
4. PE	0.844	***	0.758	***	0.546	***	**0.718**								
5. AM	0.538	***	0.548	***	0.391	***	0.679	***	**0.730**						
6. FC	0.332	***	0.318	***	0.342	***	0.461	***	0.438	***	**0.743**				
7. BI	0.535	***	0.613	***	0.413	***	0.650	***	0.741	***	0.375	***	**0.878**		
8. CUB	0.482	***	0.539	***	0.409	***	0.580	***	0.661	***	0.267	***	0.776	***	**0.887**

Note. * $p <.05$, ** $p <.01$, *** $p <.001$

According to Table 7, all of the constructs showed that the square root of AVE values is higher than the correlation coefficient among constructs. Thus, the discriminant validity among constructs is achieved.

Table 8 Confirmatory Factor Analysis Fit Indices and Adjustments

Fit Index	Criteria	Source	Statistical Values
RMSEA	≤ 0.08	Navarro and Foxcroft (2019)	0.035
CFI	≥ 0.90	Navarro and Foxcroft (2019)	0.981
TLI	≥ 0.90	Navarro and Foxcroft (2019)	0.978
Model Summary			In harmony with empirical data

Table 8 shows that according to the study of Navarro and Foxcroft (2018), the CFI>0.9, TLI>0.9, and RMSEA standards are about 0.05 to 0.08. A good fit level should meet the following standards:

CFI>0.95, TLI>0.95, and RMSEA<0.05 (Navarro & Foxcroft, 2019). The results of the CFA model fit index show that the model in this study achieved a satisfactory fit effect.

Table 9 Fit Indices Results of the Structural Equation Model

Fit Index	Criteria	Source	Statistical Values
GFI	≥ 0.80	Cho et.al. 2020	0.997
SRMR	≤ 0.08	Cho et.al. 2020	0.035
RMSEA	≤ 0.10	Hooper et al. 2008	0.065
CFI	≥ 0.80	Hooper et al. 2008	0.980
TLI	≥ 0.80	Sharma et al., 2005	0.978
Model Summary			In harmony with empirical data

The analysis results in Table 9 show the following values of the selected fit indices. The index results are: GFI=.997, SRMR=.035, RMSEA=.065, CFI=.980, TLI=.978. The model fit analysis of this study is consistent with the empirical data.
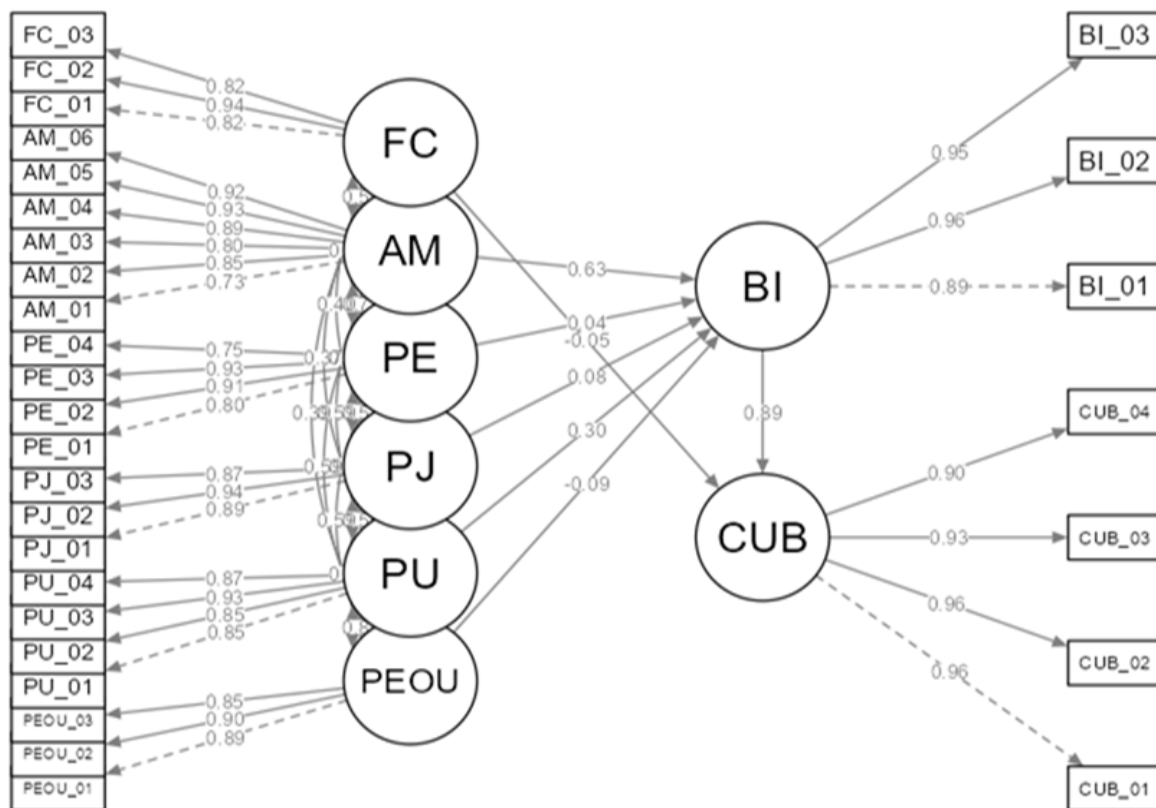

Figure 3 The Structural Equation Model (SEM) Path Diagram of the Study

Table 10 SEM Parameter Estimates

Dep	Pred	b	SE	95% Confidence Intervals		β	z	p
				Lower	Upper			
BI	PEOU	-0.086	0.059	-0.202	0.029	-0.086	-1.466	0.143
BI	PU	0.316	0.058	0.202	0.429	0.300	5.443	< .001
BI	PJ	0.079	0.032	0.017	0.141	0.079	2.503	0.012
BI	PE	0.048	0.046	-0.043	0.138	0.043	1.039	0.299
BI	AM	0.775	0.048	0.682	0.869	0.631	16.246	< .001
CUB	FC	-0.057	0.040	-0.136	0.022	-0.049	-1.406	0.16
CUB	BI	0.951	0.028	0.896	1.005	0.887	34.222	< .001

The SEM parameter estimates table (Table 10) shows the hypothesis testing for each of the hypotheses stated in the study.

Table 11 Hypothesis Testing Results of the Structural Equation Model

Hypothesis	Standardized Coefficients (β)	z-value	Result
H_a1: Perceived Ease of Use (PEOU) can positively influence Behavioral Intention (BI).	-0.086	-1.466	Not Supported
H_a2: Perceived Usefulness (PU) can positively influence Behavioral Intention (BI).	0.300	5.443***	Supported
H_a3: Perceived Enjoyment(PJ) can positively influence Behavioral Intention (BI).	0.079	2.503*	Supported
H_a4: Performance Expectations (PE) can positively influence Behavioral Intention (BI).	0.043	1.039	Not Supported
H_a5: Autonomy Motivation (AM) can positively influence Behavioral Intention (BI).	0.631	16.246***	Supported
H_a6: Facilitating conditions (FC) can positively influence Continue Usage Behavior (CUB).	-0.049	-1.406	Not Supported
H_a7: Behavioral Intention (BI) can positively influence Continue Usage Behavior (CUB).	0.887	34.222***	Supported

*** = P<.001, * = P<.05

Table 12 Mediating Effects of Behavior Intention (BI)

Description	Estimate	SE	95% CI		β	z	p
			Lower	Upper			
PEOU⇒BI⇒CUB	-0.082	0.056	-0.191	0.027	-0.076	-1.470	0.142
PU⇒BI⇒CUB	0.300	0.054	0.194	0.406	0.266	5.528	< .001
PJ⇒BI⇒CUB	0.075	0.030	0.016	0.135	0.070	2.477	0.013
PE⇒BI⇒CUB	0.046	0.044	-0.041	0.132	0.038	1.036	0.300

Description	Estimate	SE	95% CI Lower	95% CI Upper	β	z	p
AM⇒BI⇒CUB	0.737	0.048	0.644	0.830	0.559	15.482	< .001

*** = P<.001, * = P<.05

Table 13 Hypothesis Testing Results of the Structural Equation Model (Mediating Variables)

Hypothesis	Standardized Coefficients (β)	z-value	Result
H_a8: Behavior Intention (BI) mediates the relationship between Perceived Ease of Use (PEOU) and Continue Usage Behavior (CUB).	-0.076	-1.470	Not Supported
H_a9: Behavior Intention (BI) mediates the relationship between Perceived Usefulness (PU) and Continue Usage Behavior (CUB).	0.266	5.528***	Supported
H_a10: Behavior Intention (BI) mediates the relationship between Perceived Enjoyment(PJ) and Continue Usage Behavior (CUB).	0.070	2.477*	Supported
H_a11: Behavior Intention (BI) mediates the relationship between Performance Expectations (PE) and Continued Usage Behavior (CUB).	0.038	1.036	Not Supported
H_a12: Behavior Intention (BI) mediates the relationship between Autonomy Motivation (AM) and Continue Usage Behavior (CUB).	0.559	15.482***	Supported

*** = P<.001, * = P<.05

The standardized coefficient (β) of the mediating effect of PEOU on CUB is -0.076, the z value is -1.470, and the p value is 0.142. The standardized coefficient (β) of the mediating effect of PU on CUB is 0.266, the z value is 5.528, and the p value is less than 0.001. The standardized coefficient (β) of the mediating effect of PJ on CUB is 0.070, the z value is 2.477, and the p value is 0.013. The standardized coefficient (β) of the mediating effect of PE on CUB is 0.038, the z value is 1.036, and the p value is 0.300. The standardized coefficient (β) of the mediating effect of AM on CUB is 0.559, the z value is 15.482, and the p value is less than 0.001.

Conclusion

(1) The results in Table 10 show that: the effect of PEOU on BI is b=-0.086, p=0.143, indicating that perceived ease of use has no significant effect on behavioral intention. The effect of PU on BI is b=0.316, p<0.001, indicating that perceived usefulness significantly enhances behavioral intention. The effect of PJ on BI is b=0.079, p=0.012, indicating that perceived enjoyment has a positive effect on behavioral intention. The effect of PE on BI is b=0.048, p=0.299, indicating that performance expectations have no significant effect on behavioral intention. The effect of AM on BI is b=0.775, p<0.001, indicating that autonomous motivation has a significant positive effect on behavioral intention. In addition, the effect of FC on CUB is b=-0.057, p=0.16, indicating that facility conditions are not a significant influencing factor of continuous use behavior. The effect of BI on CUB is b=0.951, p<0.001, indicating that behavioral intention significantly enhances continuous use behavior.

(2) The SEM parameters in Table 11 explain the level of different psychological factors affecting the intention to use FCR and the continued use behavior, providing evidence for understanding students' use of FCR behavior. The standardized coefficient (β) of PEOU on BI is -0.086, and the z value is -1.466. The

standardized coefficient (β) of PE on BI is 0.043, and the z value is 1.039. The standardized coefficient (β) of FC on CUB is -0.049, and the z value is -1.406. The P values of these three hypothesis tests are greater than 0.05, indicating that perceived ease of use, performance expectations, and facility conditions have no significant positive effects on behavioral intention or continued use behavior. The standardized coefficient (β) of PU on BI is 0.300, the z value is 5.443, and the P value is less than 0.001. The standardized coefficient (β) of PJ on BI is 0.079, the z value is 2.503, and the P value is less than 0.05. The standardized coefficient (β) of AM on BI is 0.631, the z value is 16.246, and the P value is less than 0.001. The standardized coefficient (β) of BI on CUB is 0.887, the z value is 34.222, and the P value is less than 0.001, indicating that perceived usefulness, perceived enjoyment, and autonomous motivation have a significant positive impact on behavioral intention and continued use behavior.

(3) The Table 11-13 results show that the mediating effect of perceived ease of use on continued use behavior through behavioral intention is not significant (p > 0.05), so hypothesis H8 is not supported. The mediating effect of perceived usefulness on continued use behavior through behavioral intention is significant (p < 0.001), so hypothesis H9 is supported. The mediating effect of perceived enjoyment on continued use behavior through behavioral intention is significant (p < 0.05), so hypothesis H10 is supported. The mediating effect of performance expectation on continued use behavior through behavioral intention is not significant (p > 0.05), so hypothesis H11 is not supported. The mediating effect of autonomous motivation on continued use behavior through behavioral intention is significant (p < 0.001), so hypothesis H12 is supported.

Suggestions

(1) Under mandatory conditions, perceived usefulness, perceived enjoyment, and autonomous motivation are significant factors affecting students' behavioral intention and continued use of FCR. However, in descriptive statistics, students have neutral attitudes towards the above factors. This indicates that the functional design of FCR still needs to be further improved in these aspects.

(2) Under mandatory conditions, perceived ease of use and performance expectations cannot significantly affect behavioral intention and continued use; facility conditions have no positive impact on continued use. However, in descriptive statistics, students agree with the positive effects of perceived ease of use and facility conditions. This finding contradicts previous studies, indicating that their influence may be masked by other factors. It needs to be expanded and explained in future research.

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