

Correlation Model Design between College Students of Xi'an and Mobile Electronic Commerce

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Keywords: Mobile electronic commerce; correlation model; effect; path

Abstract. This paper analyzes influence factors of college students on their intention of using mobile online shopping for the first time. UTAUT theory is applied to the study on influence factors of college students' initial usage of mobile online shopping. The paper introduces perceived risk and perceived enjoyment to UTAUT theory tentatively, constructs research model and obtains data by using questionnaire inquiry. This paper conducts empirical test on proposed research model. The results indicate that five influence factor variables have different ranking incidence on initial usage intention: effort expectation>social impact>perceived enjoyment>performance expectation>perceived risk. Through e-commerce, it can bring about stable and high-quality mobile shopping online demand to mobile electronic commerce enterprises.

1. Introduction

Mobile online shopping refers to the behavior that uses Smartphone and tablet PC, etc., devices to visit mobile internet to go shopping online [1,2,3]. On the whole, transaction scale of mobile online shopping has been staying in high-speed growth stage in recent years. However, compared with traditional online shopping, its transaction scale is still smaller. Most of college students don't have experience to use mobile online shopping practically and has lower degree of acceptance on it [4]. For mobile electronic commerce enterprises, it is extremely important to know about influence factors of initially using mobile online shopping for college students. Meanwhile, college students also have important significance on mobile electronic commerce enterprises. Although their current consumption ability is limited, when they come upon the stage, they will become the main force of using mobile online shopping [5]. If college students can form a good habit of using mobile online shopping, they will become stable client groups of mobile electronic commerce enterprises in the future. Thus, the main purpose of this paper is to study factors of impacting college students' intention of using mobile online shopping initially.

This paper regards correlation application of college students' mobile ecommerce at a university in Xi'an area as research objects. Under the modeling situation of technology acceptance model, it constructs consumption attitude intention model that relates to college students' online shopping, meanwhile makes a comparison between different students, such as college students who are familiar with internet, college students who often scan e-commerce, and college students that have different network online shopping experience. By comparing with college students' attitude towards online shopping, network consumption intention, and various factors that impact college students' online shopping, as well as using questionnaire survey to collect related data, the paper carries out empirical analysis by using SPSS for collected data.

2. Model and Design of College Students in E-Commerce Consumption Decisions

2.1 Modeling and Hypothesis

In the influence factor model of college students' online shopping, this paper, based on theoretical basis of technology acceptance model, thinks that perceived online shopping usefulness has influences on Tourist Attitude and intention. For perceived online shopping mobility, online shopping risk perception, website characteristic perception and cognition of commodity factors, it just demonstrates its influences on Tourist Attitude, but it doesn't consider influences of college

student intention. It is mainly because influences of these four factors on college students intention aren't found. Moreover, due to limitations of the research, this paper also doesn't take influences of four factors on college student intention into consideration. According to the above-mentioned discussion, the model is proposed as shown in Figure 1:

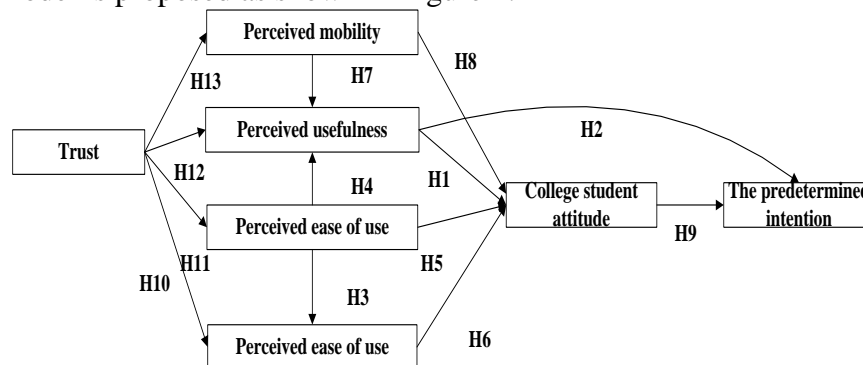


Figure 1 College Student Booking Intention Model of Mobile Electronic Commerce

This research model regards TAM model as theoretical basis and core, and combines with other multiple factors, including T, PIN, PU, EOU, PE, PM and Tourist Attitude—TA, and college student booking intention—BI, etc., eight measured variables. The model mainly includes two parts: one is tourists acceptance mobile terminal college student booking intention model, and the other one is influences of T and PIN on college student acceptance mobile terminal tourist booking intention model.

o verify are concluded as follows:

H1: college student individual factors impact college student website characteristics.

H2: college student individual factors impact college student online shopping

H3: college student individual factors impact commodity factors

H4: college student individual factors impact online shopping risk perception

H5: college student individual factors impact online shopping attitude

H6: college student individual factors impact online shopping behavior

H7: perception of college student website characteristics impacts perceived online shopping usefulness positively.

H8: perception of college student website characteristics impacts college student online shopping attitude positively.

H9: college student perceived online shopping mobility impacts perceived online shopping positively.

H10: college student perceived online shopping usefulness impacts college student online shopping attitude positively.

H11: college student perceived online shopping usefulness impacts college student online shopping intention positively.

H12: college student perceived online shopping mobility impacts college student online shopping attitude positively.

H13: college student perceived online product quality information impacts online shopping attitude positively.

2.2 Data Analysis Tool and Method

Data analysis adopts statistical analysis software SPSS21.0 to process research data. Through descriptive statistical analysis, it observes distribution of each data, measures degree of consistency between indicators through reliability analysis, tests significant degree of each item on variables through validity analysis, and performs a test on model hypotheses ultimately by adopting correlation analysis and regression analysis. This study adopts the most frequently-used reliability coefficient Cronbach α coefficient to present the high and low degree of reliability. Criterion for reliability coefficient in this research is shown in Table 1.

Table 1 Criterion for Reliability Coefficient

	Reliability coefficient of questionnaire	Univariate reliability coefficient of
a	0.7	0.5

Namely, if Cronbach α coefficient of the entire scale is above 0.7, and Cronbach α coefficient of each variable is above 0.5, it indicates that reliability of this scale is good and can continue to be analyzed.

This paper adopts factor analysis method provided by SPSS21.0 to verify structure validity of the questionnaire. When factor loading of each item is more than 0.5, structure validity can be acceptable and obvious.

2.3 Research Objects

This study adopts questionnaire method to collect materials and data. The questionnaire includes two parts: one is used for measuring the behavior that users use mobile internet to conduct group buying. According the measurement dimension in previous section, every question applies Likert five-point scale to measure from extreme disagreement to extreme agreement. Section two is about individual information of subjects, net years of mobile internet and time of using mobile internet every day, so as to know about using behavior of people with different backgrounds on mobile internet. In addition, the beginning of questionnaire should aim at explaining mobile internet, ensuring that subjects will have comparatively clear cognition and understanding on mobile internet.

This study adopts two ways of giving out questionnaire on the internet and providing questionnaire on the spot to conduct data collection of school students in Xi'an. Ultimately, through 221 pieces of network collections and 100 pieces of questionnaires on the spot are returned completely. There are a total of 321 pieces of questionnaires. According to a certain rule, after selecting the questionnaire and getting rid of 17 ineffective questionnaires, there are a total of 304 pieces of effective questionnaires. The effective recovery is 94.7%.

3 Model Empirical Analysis and Inspection

3.1 Correlation Analysis

The correlation analysis between variables only indicates the tight degree and changeable direction of the relationship between two variables, but they don't explain the causal relationship between them. In order to verify performance expectation, effort expectation, social impact, perceived enjoyment, the causal relationship between perceived risk and initial usage intention provided by these research hypotheses, it is essential to conduct further regression analysis.

Table 2 performance expectation, effort expectation, social impact, perceived enjoyment, the causal relationship between perceived risk and initial usage intention.

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		Initial usage intention
performance expectation	Pearson correlation (bilateral)	0.511
		0
		308
effort expectation	Pearson correlation (bilateral)	0.479
		0
		308
social impact	Pearson correlation (bilateral)	0.527
		0
		308
perceived enjoyment	Pearson correlation (bilateral)	0.509
		0
		308
perceived risk	Pearson correlation (bilateral)	-0.242
		0
		308

It can be observed that degree of correlation for five variables of performance expectation, effort expectation, social impact, perceived enjoyment and perceived risk include moderate correlation and low correlation. There is no related phenomenon of high correlation. In addition, significance testing P value of correlation coefficient between perceived risk and performance expectation are more than 0.5, indicating correlation and perceived hypotheses and correlation among performance expectation, effort expectation, social impact, perceived risk and initial usage intention are consistent, namely except for negative correlation of perceived risk and initial usage intention, there is positive correlation among the rest four influence factors and initial usage intention.

3.2 Inspection of Mesomeric Effect

Mediating variable refers to the variable that can play the function of explaining the relationship between independent variable and dependent variable. For example, X is independent variable, Y is dependent variable, M is mediating variable and X impacts Y in the form of influencing M. If there is no M, X won't impact Y. The second one is partial mediation, namely X impacts Y by partially influencing M, while the part of them impact Y directly.

This study uses a test method on inspection of mediating effect, as shown in Figure 2:

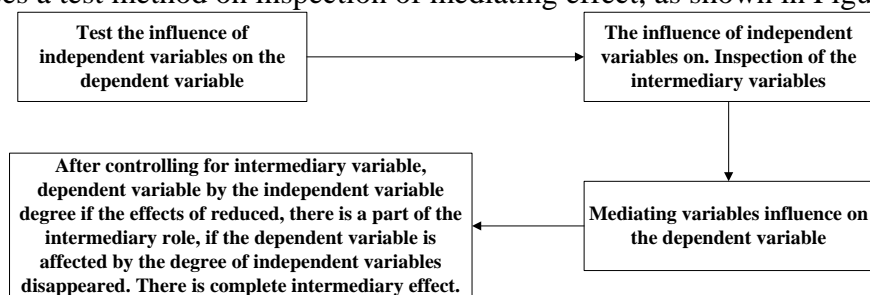


Figure 2 Checkout Procedure of Mediating Inspection

Performance expectation has mediating effect between effort expectation and initial usage intention. We conduct regression analysis on effort expectation and initial usage intention. The result is shown in Table 3:

Table 3 Influence of Effort Expectation on Initial Usage Intention

Independent variable	Dependent variable	β	Standardized β	t value	Adjusted R^2	F value
Effort expectation	Initial usage intention	0.526	0.479	9.553***	0.230	91.529
Standardized regression equation: initial usage intention=0.479*effort expectation						

We conduct regression analysis on effort expectation and performance expectation. The result is shown in Table 3:

Table 4 Influence of Effort Expectation on Performance Expectation

Independent variable	Dependent variable	β	Standardized β	t value	Adjusted R^2	F value
Effort expectation	Initial usage intention	0.498	0.449	8.794***	0.202	77.326
Standardized regression equation: performance expectation=0.449*effort expectation						

We conduct regression analysis on performance and initial usage intention. The result is shown in Table 5:

Table 5 Influence of Performance on Initial Usage Intention

Independent variable	Dependent variable	β	Standardized β	t value	Adjusted R^2	F value
Effort expectation	Initial usage intention	0.506	0.511	10.391***	0.261	107.971
Standardized regression equation: initial usage intention=0.511* performance expectation						

We conduct regression analysis on effort expectation, performance expectation and initial usage intention. The result is shown in Figure 6:

Table 6 Influence of Effort Expectation and Performance Expectation on Initial Usage Intention

Independent variable	Dependent variable	β	Standardized β	t value	Adjusted R^2	F value
Effort expectation	Initial usage intention	0.344	0.313	6.009***	0.399	78.232
Performance expectation	Initial usage intention	0.366	0.370	7.103***		
Standardized regression equation: initial usage intention=0.313*1effort performance+0.370* performance expectation						

Through the above-mentioned four regression analyses, we can find that effort expectation plays a significant positive effect on initial usage intention. Effort expectation plays a significant positive effect on performance expectation, and performance expectation plays a significant positive effect on initial usage intention. Ultimately, through regression analysis on effort expectation, performance expectation and initial usage intention, we can found that standardized regression coefficient P value of effort expectation is dropped to 0.313 from 0.479 by comparing with individual standardized regression coefficient of effort expectation on initial usage intention. This proves that performance expectation plays the mediating effect between effort expectation and initial usage intention.

3.3 Path Analysis

Path analysis is a kind of statistical approach to analyze the relationship between variables in the modeled way. Traditionally, path analysis will consist of a series of regression analyses, combine with different equations by putting forward research hypotheses to form structured model, and conduct multiple regression with SPSS or SAS software to complete estimation of parameter model. This path analysis method is called as regression-oriented path analysis. In multiple regression analysis, there is coordinating relation between independent variables, reflecting in direct effect of independent variable on influence of dependent variable. In path analysis, it can differentiate direct

effect and indirect effect of independent variable on influence of dependent variable. Total effect of independent variable on dependent variable is equal to the sum of direct effect and indirect effect. In the model of this paper, due to existence of mediating variable, it is necessary to differentiate direct effect and indirect effect of each influence factor on initial usage intention. Moreover, it should use total effect indicator as the criterion of contrasting influencing degree of each influence factor on initial usage intention. Influence factors' path diagram of college student initial mobile online shopping intention is shown in Figure 1.

We conduct regression analysis on initial usage intention by regarding five influence factors as independent variables, including performance expectation, effort expectation, social impact, perceived risk and perceived enjoyment, as shown in Table 7, so as to draw direct influencing effect of these five influence factors on initial usage intention. From the result of regression analysis, it can be observed that four influence factors, such as performance expectation, effort expectation, social impact and perceived enjoyment, as independent variables play a significant positive influence on initial usage intention. Perceived risk plays a significant negative influence on initial usage intention. $F=52.497$, it reaches 0.001 significance level. Adjusted determination coefficient is 0.456, indicating that as independent variables, these five influence factors can explain 45.6% amount of variability for initial usage intention.

Table 7 Regression Analysis Results for Direct Impact Effect of Five Influence Factors on Initial Usage Intention:

Independent variable	Regression coefficient	Standard error	Standard regression coefficient	t value	P value
Constant term	0.895	0.332		2.699	0.007
Performance expectation	0.224	0.052	0.226	4.338	0
Effort expectation	0.179	0.057	0.163	3.160	0.002
Social impact	0.246	0.056	0.226	4.377	0
Perceived enjoyment	0.254	0.052	0.242	4.923	0
Perceived risk	-0.153	0.057	-0.120	-2.686	0.008
Independent variables: initial usage intention= $R=0.682$, $R^2=0.465$; adjusted $R^2=0.456$, $F=52.497^{***}$.					

It can be observed that social impact and effort expectation play a significant positive effect on performance expectation. $F=62.464$, it reaches 0.001 significant level. Adjusted determination coefficient is 0.286, indicating that regarding social impact and effort expectation as variables can explain 28.6% amount of variability for performance expectation.

Through the parameter estimation results of path analysis on path coefficient, it can obtain path analysis results of influence factors on college student initial usage intention of mobile online shopping (the figure in the upper arrow of three endogenous variables, including performance expectation, perceived enjoyment and initial usage intention, is residual coefficient).

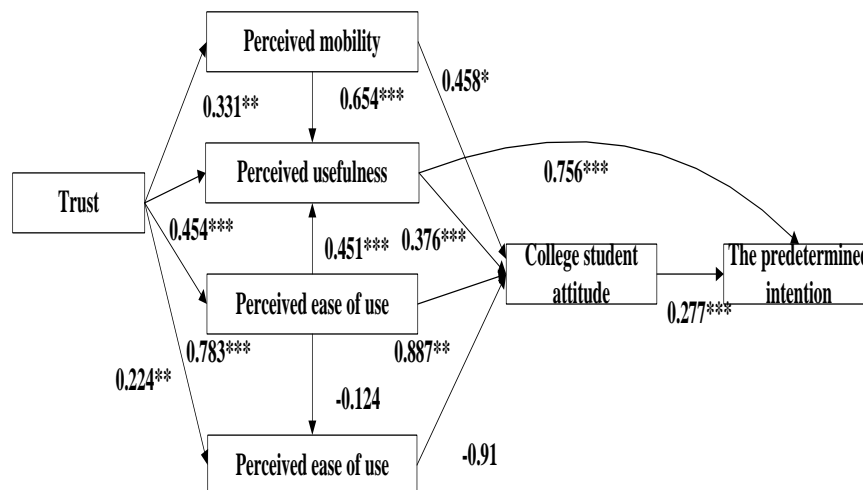


Figure 3 Path Analysis Results of Influence Factors on College Student Initial Usage Intention of Mobile Online Shopping

Indirect effect value of social impact on initial usage intention (social impact-->performance expectation-->initial usage intention)= $0.331 \times 0.226 = 0.075$

Indirect effect value of effort expectation on initial usage intention (effort expectation-->performance expectation-->initial usage intention; effort expectation-->perceived enjoyment-->initial usage intention)= $0.305 \times 0.226 + 0.329 \times 0.242 = 0.149$.

It can be observed from the above table, important degree of each influence factor on initial usage intention: effort expectation>social impact>perceived enjoyment>performance expectation>perceived risk.

3.5 Inspection Results

Empirical inspection results for research hypotheses are shown in Table 8:

Codes	Hypotheses	Empirical Results
H1	college student individual factors impact college student website characteristics.	Yes
H2	college student individual factors impact college student online shopping	Yes
H3	college student individual factors impact commodity factors	No
H4	college student individual factors impact online shopping risk perception	Yes
H5	college student individual factors impact online shopping attitude	Yes
H6	college student individual factors impact online shopping behavior	No
H7	perception of college student website characteristics impacts perceived online shopping usefulness positively.	Yes
H8	perception of college student website characteristics impacts college student online shopping attitude positively.	Yes
H9	college student perceived online shopping mobility impacts perceived online shopping positively.	Yes
H10	college student perceived online shopping usefulness impacts college student online	Yes

	shopping attitude positively.	
H11	college student perceived online shopping usefulness impacts college student online shopping intention positively.	Yes
H12	college student perceived online shopping mobility impacts college student online shopping attitude positively.	Yes
H13	college student perceived online product quality information impacts online shopping attitude positively.	Yes

4 Conclusions

In user groups of mobile online shopping, college students play particular and important significance. It can say that college students are core user groups in future mobile online shopping. Though consumption ability of college students is limited, they will be main force of using mobile online shopping in the future. They form a stable consumption habit of using mobile online shopping, in school time, so they will bring stable and high-quality mobile online shopping demand to mobile e-commerce enterprises, after they enter into the society. Meanwhile, for such an newly sprouted thing of mobile online shopping, college students are easier to accept it. The reason for effort expectation can become the most important influence factor is because this paper uses college students without experience as research objects. Under the premise of considering that college students have abundant usage experiment of mobile internet and traditional online shopping experience, once college students have experience, important degree of effort expectation will be reduced. College students are groups with abundant online shopping experience, so perceived risk can't play a negative effect on initial usage intention of mobile online shopping to a higher degree.

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