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THE INFLUENCE OF ONLINE EDUCATIONAL PLATFORM MANAGEMENT ON PARTICIPATOR'S SELF-EFFICACY IN CHINA

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ABSTRACT

This present research aims to analyze the influence of online educational platform management towards the participator's self-efficacy in the context of online teaching and learning in China. A theoretical model was developed based on the theories of social exchange behavior, technology acceptance model and expectation confirmation model to determine whether such factors as educational content's quality, educational platform system quality and online interaction directly affect Chinese students' information cognition requirements such as perceived usefulness, expectation confirmation and self-efficacy, which was tested using preliminary statistical analysis through online data collection from a sample of 339 responders in China. Furthermore, Structural Equation Modeling analysis was used to test the hypotheses of this present study, and the results showed that all factors of online educational platform management directly, indirectly and totally effects on Chinese students' self-efficacy in the online learning environment, which were used to develop the final research model. Practical implications regarding the improvement of online education management system are discussed as well as how the online learning could help students achieve greater self-efficacy. Importantly, this research also addresses the recommendations and limitations conducted with Chinese online educational participators in different educational institutions are presented at the end of the paper.

Keywords: Online education; social exchange behavior; technology acceptance model; expectation confirmation; self-efficacy

1. INTRODUCTION

The traditional educational processes are currently facing threats because of the coronavirus pandemic. At the end of the Spring Festival in 2020 all students in China were arranged to stay at home and pursue their education online to curtail the spread of the novel virus. Indeed, as a new platform in this information age, online education was used to replace traditional classrooms as it provides open access to

educational resources and technologies, and continue to give learning opportunities to students without exposing themselves to health risks (Moore and Kearsley, 2012). However, many Chinese educational organizations are still not fully aware of the nature of the learners' cognitive response to online learning and their accompanying needs such that a strategy for online education progress should be developed to serve the needs of the students and, at the same time, enhance the competitive advantage of the organization.

Hence, this present study examines the influences of online educational platform management such as the educational content's quality, educational platform's system quality and online interaction on participator's cognition, which involves perceived usefulness, expectation confirmation and self-efficacy. To the best of the researcher's knowledge, this present study is one of the few studies conducted in the current online environment of Chinese online educational platforms during this time of pandemic. The findings contribute to the theoretical perspectives regarding the influence of online educational platform towards participators' cognition by not only determining its indirect effects but also considering its total effects toward all of the variables under study. Practical implications of the findings are discussed in this paper.

2. LITERATURE REVIEW

2.1 Interaction model in distance education

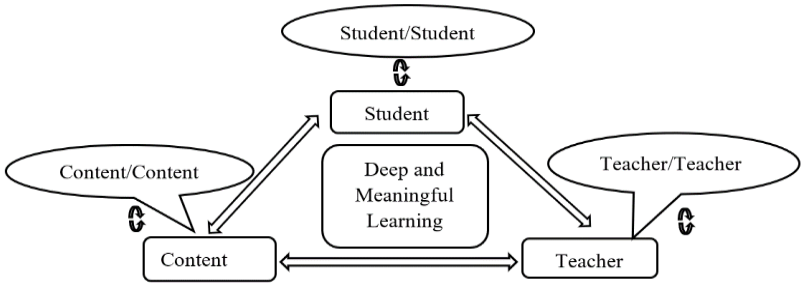

Figure 1: Interaction Model in Distance Education

In 1998, the interaction among student-student, student-teacher and student-content in distance education was promoted by Anderson and Garrison, and other forms of interaction such as teacher-content, teacher-teacher and content-content interaction were also expanded based on the change of technical environment as shown in Figure 1 (Anderson and Garrison, 1998). Generally, many educational organizations believe that online education is mediated by some sort of digital technology. However, the realities of online education have proven that learning behavior could not be attributed to technology but rather to the teaching activities and strategies designed by the teacher. Learning materials as well as the instructor's guidance and direction contribute profusely to the learner's interest on the subject matter and to the overall learning experience (Moore and Kearsley, 2005; Ally, 2008).

The interaction between student and teacher is a knowledge content that is generally regarded as text-based learning environment delivered through printed materials while learning that takes place through online studying and researching is called knowledge ground environment, which is yet to be fully accepted (Moore and Kearsley, 2005). The knowledge that is contained in online educational process can either be external to the student who is doing, responding and participating in online classroom or it can be internal with the student examining his or her assumptions about the concerned topics by himself (Stones, 1966; Abbatt and McMahon, 1993). Meanwhile, with the advantage of communication technology, there are now some opportunities for students to synchronously interact with their teachers and vice versa through online platform since messenger chats, discussion forums, text messages and video calls have been made available for educational use and purposes (Downes and Siemens, 2008). These social media technologies also allow students to do more interaction online and value the online educational system more.

The online education system can be considered as a two-way communication process between information receivers (instructor and student) and information resources (the contents and class-activities) (Wiener, 1948). Besides, the information receivers (instructor and student) are also information senders, which reflect that the relationship between the contents and related instructors and students are interdependent through online information flow and transmission. Referring to Anderson and Garrison's (1998) proposition, online education process can be divided into two categories, which are content interaction and interpersonal interaction. These categorizations are formed because online educational interaction can be identified as human-online educational platform interaction and human-human interaction (Massey and Levy,

1999). But no matter how they are differentiated and studied, the interaction behaviors that exist in educational network are always affected by machine and human (Wu and Chang, 2005). Moreover, this kind of online interaction behavior is mostly manifested in information collection, intercommunication, information selection, information response and personalization, etc. (Chen and Yen, 2004; Lee, 2005; Song and Zinkhan, 2008). It is then reasonable to believe that the characteristics of online education are mainly affected by the ubiquity of information and the particularity of information user's needs, which significantly means that online education process is performed as an information environment created by the instructors and students based on their own needs. Besides, the atmosphere in online educational platform can cause students to participate spontaneously, and voluntarily share information, which is a sort of information interaction (Pettigrew, 1999). Furthermore, there are several relevant scholars who have made some preliminary discussions about this matter and they are listed as follows:

a) The attraction and interactivity of online educational platforms affect the related participators' experience (Skadberg and Kimmel, 2004).

b) The interaction speed of the online educational platform significantly affects the related participators' remote perception (Chen et al., 2009).

c) The interactivity of the online educational platform affects the related participators' attitudes and behavior towards the information environment through their experience with the system platform (Chang and Wang, 2008).

2.2 Social exchange behavior

Social exchange behavior refers to both interpersonal behavior and psychological interaction, which points out that the development of social behavior depends on mutual reinforcement and the ratio of costs and rewards from each other in mutual interaction (Blau, 1964). Based on various relevant researches, the application for social exchange theory in online educational process mainly includes the following four key elements (Molm, 2001):

a) Exchange main body – refers to the students, instructors or educational contents in online educational platform. Also, social exchange can take place in any interaction that exists between student and student, student and teacher, teacher and content and student and content.

b) Exchange resources – exists as intangible resources such as online educational platform services, online teaching process and digitized educational material.

c) Exchange structure – is the exchange form that exists between the main bodies. It could be a system of education, communication and service in the online educational platform.

d) Exchange process – refers to the exchanging process of resources between the main bodies in the online educational platform.

Also, social exchange theory can be expressed in terms of Reward-Cost=Outcome. In a nutshell, when the results obtained by both parties are positive, the interaction will continue; if the result is negative, the interaction will be impacted (Pianta, 1999; Stephanie, 2013). Specifically, the performance of social exchange theory in online educational platform can also be presented as self-efficacy, a psychological expression of knowledge contributors that significantly affect the use of digitized knowledge base are carried out while under the control of situational factors and reciprocity (Kankanhalli et al., 2005; Shaari et al., 2014). It means that when the instructor and student actively participate in online courses, they need to pay a certain cost such as time and energy consumed, and at the same time, they could also obtain certain intangible benefits such as pleasure, self-identity and satisfaction. Only when the instructor and student perceive that their rewards are greater than costs that they are more likely to participate the related learning behaviors. Besides, the student's information behavior is more of a spontaneous behavior in online educational process, so in this case, the educational content and the quality of education plays an important role as it will directly affect the responder's value judgment on knowledge acceptance and sharing (Roaimah et al., 2010; Torres et al., 2018). Therefore, we can expound the internal mechanism of the online educational platform management and participator's cognition process from the perspective of social exchange theory.

2.3 Technology acceptance model

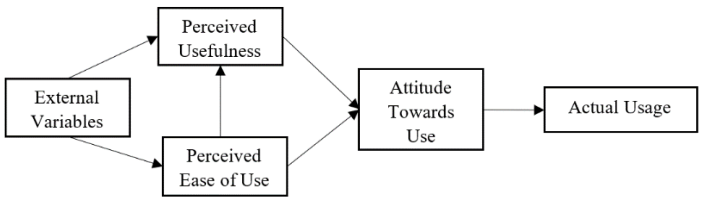

Figure 2: Technology Acceptance Model

In 1989, technology acceptance model (TAM) was presented by Davis, which was used in explaining the main factors in the degree of IT acceptance as shown in Figure 2. In his proposition, external variables refer to the initial factors that users consider whether to adopt a particular information system or not, which directly decides perceived ease of use (PEOU), then together with PEOU decides perceived usefulness (PU). The attitude towards use depends on PU and PEOU, which make an effect towards intention to use to the actual usage.

The TAM is now accepted by many researchers in various fields and became the main model in studies about information technology development. The research objectives of TAM are moving from the public to a particular group (Fathema and Sutton, 2013; Fathema et al., 2015; Okafor et al., 2016). As the component and existence of online educational environment platform, educational content's quality and operation system quality significantly affect the participator's experience and behavior (Al-Mamary et al.,2014; Popoola et al., 2014). As proof, further research on the successful model in the information system approves the quality of educational content, operation system and online service that influence the participator's satisfaction and behavior (Delone and McLean, 2003). Similarly, the task-technology fit theory clearly pointed out that the degree of adaption of technical features and task requirements can impact directly the user's behavior (Goodhue and Thompson, 1995). This means that when the online education process is regarded as an interactive information exchange among the participators, or between the participators and the platform, its relevant technical features involved will inevitably and directly impact their participation intention. Specifically, the operation system quality, educational content's quality, and the degree of freedom of knowledge (information) expression and so on will impact their continuous participation by influencing the participator's cognitive process (or personal experience) (Davis et al., 1989; Cronin et al., 2000; Debatin, et al., 2009; Liu and Shao, 2005; Yang, 2011).

2.4 Expectation confirmation model of information system

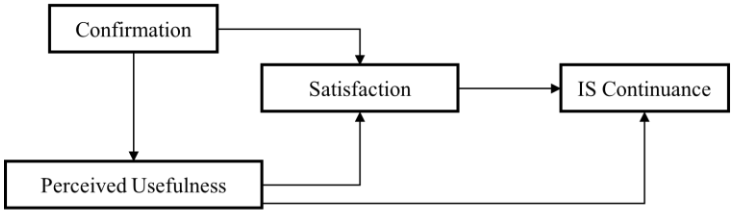

Figure 3: Expectation Confirmation Model in Information System

The expectation confirmation model in the information system context was proposed by Bhattacherjee (2001). As shown in Figure 3, perceived usefulness explains the extent to which a person believes that using a particular information system will enhance his job performance (Davis, 1989). Confirmation represents the congruence level for the user's perceptions between the expectation of information system usage and its actual performance (Bhattacherjee, 2001). Satisfaction refers to the user's emotions about the prior use of the information system, and continuance intention is the user's intention to continue using the information system (Bhattacherjee, 2001).

According to the theoretical background described in expectation confirmation research, the participators in online educational platform may have certain expectations before they access the relevant online educational platform. To meet their expectations, the educational platforms always design some study packages in tandem with related technology and service support, because they believe those persons will be delighted when the quality of the education is beyond their expectation, which will consequently lead to positive behavioral intentions (Bhattacherjee, 2001). Thus, the positive behavioral intentions in actual operation could be developed by generating effective information coordination on how to respond to the requirements from different parties, update necessary materials and find suitable instructors, which may be instrumental in developing positive behavioral intentions concerning access to online educational platform (Bhattacherjee, 2001; Nahl, 2005). Moreover, there have been many research results, which proved that the following factors impact participator's behavioral performance in online educational platform:

- **Expectation confirmation,** as a post-adoption stage, is the user's cognition and evaluation of a certain information system adopted (Brown et al., 2007). Generally, when real experience surpasses expectation, expectation confirmation will positively affect perceptual usefulness and it also plays an important role in ensuring the participators' psychological needs in the online educational platform (Bhattacherjee, 2001; Kim and Han, 2009).
- **Perceptual usefulness** reflects the improvement of the quality and efficiency of the performance that are brought to the participator after participating in online education process, which is different from the meaning in the technology acceptance model. Besides, perceived usefulness, as an intermediate, can also make

a great impact on the initial behavior and continue using intention of the participators in the online educational platform (Tang and Deng, 2012)

3. RESEARCH MODEL AND DESIGN

Based on the statements mentioned above, the proposed conceptual model is shown in Figure 4, which includes six variables—three exogenous independent variables and two endogenous variables with self-efficacy as the induced variable:

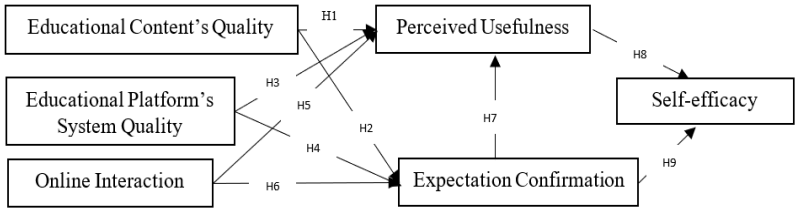

Figure 4: Proposed Theoretical Research Model

There are 9 research hypotheses that stated the direct causal effect relationships among the variables, which are referenced from previous related studies and are shown in Table 1. The references are used to identify a logical relationship between two variables involved in the hypothesis.

Table 1: Research Hypotheses

Research hypothesis	References
Educational content's quality has a significant positive direct effect on: H1. Perceived Usefulness, H2. Expectation Confirmation,	Skadberg and Kimmel (2004); Chang and Wang (2008); Chen et al. (2009); Roaimah et al. (2010); Torres et al. (2018)
Educational platform's system quality has a significant positive direct effect on: H3. Perceived Usefulness, H4. Expectation Confirmation,	Skadberg and Kimmel (2004); Chang and Wang (2008); Chen et al. (2009); Al-Mamary et al. (2014); Popoola et al. (2014)
Online interaction has a significant positive direct effect on: H5. Perceived Usefulness, H6. Expectation Confirmation,	Goodhue and Thompson (1995); Skadberg and Kimmel (2004); Liu and Shao (2005); Chang and Wang (2008); Chen et al. (2009); Debatin et al. (2009); Yang (2011)
Expectation confirmation has a significant positive direct effect on: H7. Perceived Usefulness	Bhattacherjee (2001)
Consumer satisfaction due to: H8. Perceived Usefulness, H9. Expectation Confirmation is significant and positive.	Kankanhalli et al. (2005); Nahl (2005); Kim and Han (2009); Tang and Deng (2012); Shaari et al. (2014)

However, it should be noted that there is no research hypothesis in Table 1 that concerns indirect effects, which is considered as the limitation of this present research. For further understanding, the Structural Equation Modeling (SEM) analysis was used to analyze, report and identify whether there are any significant mediation effects existing among the studied variables.

Table 2 shows the labels for the indicators, which were measured on Five-point Likert scales and treated as interval scale measures. References from previous studies were used as the source of the current measuring instrument in the following table.

Table 2: Measurement and Instruments

Educational content's quality	ECQ1: The contents in the online course are engaging.	ECQ2: The contents in the online course can stimulate my demand for new knowledge.
	ECQ3: The contents in the online course help to perfect my knowledge structure and extend my thinking space.	ECQ4: The teaching material preparation in the online course is appropriate for me.
	ECQ5: The instructor can provide a clear explanation of concepts in his/her lectures.	ECQ6: The contents in the online course can help me to solve the problems I concerned.
Educational platform's system quality	SQ1: This online educational platform's system runs reliably.	SQ2: This online educational platform's system always response fast.
	SQ3: This online educational platform's system is easy to operate.	SQ4: This online educational platform's system helps me to perform research efficiently.
	SQ5: This online educational platform's system helps me to perform research effectively.	SQ6: I am satisfied with the overall system in this online educational platform.

Table 2: Measurement and Instruments (continued)

Online interaction	OI1: The online education provider can accurately understand your needs through the network.	OI2: The online education provider can accurately answer your questions through the network platform.
Online interaction	OI3: The online education provider actively asks you how you feel about using its product through the network platform.	OI4: The online education provider can speedily respond to your needs through the network platform.
	OI5: The online education platform's feedback survey through the Internet is easy to understand.	OI6: You are willing to answer the product feedback survey through the Internet from the online education provider.
Perceived usefulness	PU1: The participation in this online study improves my study quality.	PU2: The participation in this online study enhances my study efficiency.
	PU3: It is easy for me to access the knowledge I am interested in.	PU4: This kind of online education is useful for my study.
Expectation confirmation	EC1: The educational performance from the online educational platform fits my expectation.	EC2: The process of online education fits my expectation
	EC3: The interface for the online educational platform fits my expectation.	EC4: The online educational platform's performance meets my needs
	EC5: The online educational platform's performance fits my needs.	EC6: My experience using the online education platform was better than what I expected.
Self-efficacy	SE1: I can achieve most of the goals that I set for myself through online education.	SE2: When facing difficult tasks, I am certain that I will accomplish them through online education.
	SE3: I can successfully overcome many academic challenges through the online education platform.	SE4: I am confident that I can perform effectively on many different academic tasks through the online education platform.
	SE5: Compared to other people, I can do most academic tasks very well through the online education platform.	SE6: In general, I think that I can obtain academic outcomes that are important to me.

4. DATA COLLECTION AND ANALYSIS

By using online survey method, 428 samples were obtained in China but 89 responses were removed due to either missing values or data entry errors. Finally, the total number of respondents were reduced to 339, which included 149 males and 190 females.

Table 3: Personal Characteristics of the Respondents

Age	**Frequency**	**Percent**	**Cumulative percent**	**Education background**	**Frequency**	**Percent**	**Cumulative percent**
12-17 years old	24	7.1	7.1	Junior High School	22	6.5	6.5
18-23 years old	224	66.1	73.2	Senior High School	70	20.6	27.1
24-29 years old	61	18.0	91.2	Undergraduate School	219	64.6	91.7
Over 30 years old	30	8.8	100.0	Graduate School	28	8.3	100.0
Device used to access internet				**Program**			
Table PC	27	8.0	8.0	Social Network Software	112	33.0	33.0
Laptop	147	43.4	51.3	Open Broadcaster Software	28	8.3	41.3
iPad	45	13.3	64.6	Video Websites	51	15.0	56.3
Smart phone	117	34.5	99.1	Online Office Software	133	39.2	95.6
Others	3	.6	100.0	Others	15	4.4	100.0
				Total	339	100.0	
Material							
Word (PDF) File	98	28.9	28.9				
PPT	126	37.2	66.1				
Video	86	25.4	91.4				
Traditional Book	15	4.4	95.9				
E-book	12	3.5	99.4				
Others	2	.6	100.0				
Total	339	100.0					

From Table 3, it is seen that most of the participants are less than 30 years of age (91.7 percent) and among this group, the majority of them are in the age range of 18 to 23 years. More than half (64.6 percent) of the respondents are in undergraduate school and many (20.6 percent) of the respondents are from senior high school. There are very few (6.5 percent) respondents who are in junior high school. This implies that most of the participants are relatively young but with good educational backgrounds. For the equipment used to access the online educational platform, 43.4 percent are using laptops while, 34.5 percent are using smartphone. Online information channels such as social network software and online office software are the main media for information transmission. Over thirty-nine percent of the participants do online study using online office software. In addition, 66.1 percent of the respondents reported that the most popular form of educational tools are powerpoint, word document and PDF forms.

Table 4: Model Variables Analysis: Validity, Reliability and Descriptive Statistics

Variable and indicator		Validity/ reliability			Descriptive statistics				Variable and indicator		Validity/ Reliability			Descriptive statistics			
		Factor loading	Eigen value (% of Variance)	Cronbach alpha	Mean	standard deviation	Skewness	Kurtosis			Factor loading	Eigen value (% of Variance)	Cronbach alpha	Mean	Standard deviation	Skewness	Kurtosis
Expectation confirmation (1)	EC1	.66	12.9 (47.8)	.90	3.58	1.08	-.43	-.26	Self-efficacy (2)	SE1	.51	1.7 (6.2)	.89	3.47	1.04	-.40	-.38
	EC2	.65			3.58	1.01	-.39	-.40		SE2	.74			3.47	1.00	-.23	-.57
	EC3	.73			3.61	.98	-.44	-.14		SE3	.70			3.49	1.02	-.27	-.61
	EC4	.69			3.59	.98	-.45	-.21		SE4	.70			3.58	.98	-.27	-.56
	EC5	.75			3.58	1.00	-.40	-.23		SE5	.63			3.48	.99	-.33	-.30
	EC6	.52			3.53	1.05	-.48	-.31		SE6	.58			3.58	.95	-.32	-.40
Online interaction (4)	OI2	.55	1.0 (3.7)	.80	3.54	.97	-.32	-.27	Educational Content's quality (3)	ECQ1	.73	1.3 (4.8)	.89	3.52	.93	-.20	-.17
	OI3	.57			3.51	.98	-.25	-.36		ECQ2	.69			3.47	1.07	-.37	-.53
	OI4	.73			3.57	.97	-.34	-.39		ECQ3	.64			3.56	1.00	-.27	-.68
	OI5	.63			3.63	.92	-.27	-.41		ECQ4	.75			3.41	1.00	-.21	-.43
Educational Platform's system quality (5)	SQ1	.77	.86 (3.2)	.81	3.71	1.00	-.43	-.49		ECQ5	.62			3.59	.99	-.39	-.38
	SQ2	.78			3.43	1.03	-.32	-.35		ECQ6	.57			3.45	1.05	-.39	-.40
	SQ3	.75			3.79	.96	-.65	.22									
Perceived usefulness (6)	PU1	.62	.81 (3.0)	.84	3.59	1.06	-.48	-.35									
	PU2	.66			3.50	1.07	-.47	-.28									

Note for factor analysis: *Extraction Method:* Principal Component Analysis. *Rotation Method:* Equamax with Kaiser Normalization. Rotation converged in 7 iterations. Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.957. Bartlett's Test of Sphericity Approx. Chi-Square = 5756.769, df = 351, Significance = 0.00. Components with eigenvalues less than 1 are not shown. Percentage of total variance explained = 68.797%.

Principal component factor analysis was used to examine the construct validity of the measures of the latent variables in the theoretical model, which required indicators to load onto only the component that were proposed to measure with a loading factor of at least 0.4 in magnitude and with an eigenvalue of at least 1 associated with the component (Straub et al., 2004). The Cronbach's alpha coefficients were used to examine the internal consistency reliability of the measures of the indicators for each of the latent variables. The final analytical results in Table 4 present the indicators (SQ4, SQ5, SQ6) in Educational Platform's System Quality, the indicators (OI1, OI6) in Online Interaction, and the indicators (PU3, PU4) in Perceived Usefulness were removed from further analyzing process because those indicators can reduce the validity of the collected data. The internal consistency reliability of each of the remaining six latent variables was either good or acceptable (George and Mallery, 2003). Furthermore, as shown in Table 4, the magnitudes of the measures of skewness and kurtosis for each variable and indicator are within the acceptable limits of 3 and 7, respectively, which is required for the use of maximum likelihood estimation in subsequent SEM analyses (Kline, 2016).

The correlation coefficients among the variables in this research model and the variables used to examine the characteristics of the respondents are displayed in Table 5. Furthermore, the coefficients in bold type are statistically significant at a level of 0.05 or less. The shaded cells identify significant positive correlations that referred to the 9 direct causal effects in the theoretical model. As shown in this table, all the variables in this research are significantly positively correlated with each other and there are a few significant

correlations between model variables and variables used to measure the characteristics of the participants. Besides, five additional plausible causal effects are suggested by significant correlations:

(1) educational content's quality ⇨ online interaction;
(2) educational platform's system quality ⇨ online interaction;
(3) educational content's quality ⇨ self-efficacy;
(4) educational platform's system quality ⇨ self-efficacy;
(5) online interaction ⇨ self-efficacy.

Table 5: Correlations Analysis

Variables	Age	Educational background	Device	Program	Material	Educational content's quality	Educational platform's system quality	Online interaction	Perceived usefulness	Expectation confirmation	Self-efficacy
Gender											
Age	1										
Educational background	.056	1									
Device	-.069	**-.346**	1								
Program	-.010	.100	-.042	1							
Material	.079	-.074	.044	.056	1						
Educational content's quality	**.206**	.056	**-.123**	-.048	-.104	1					
Educational platform's system quality	.077	.040	-.078	-.058	-.060	**.548**	1				
Online interaction	**.116**	.008	-.090	-.076	-.069	**.629**	**.615**	1			
Perceived usefulness	**.266**	.080	**-.107**	-.063	-.040	**.650**	**.477**	**.613**	1		
Expectation confirmation	**.178**	.090	**-.108**	-.005	-.069	**.691**	**.479**	**.632**	**.683**	1	
Self-efficacy	**.158**	.072	-.097	-.023	-.046	**.697**	**.522**	**.654**	**.679**	**.782**	1

4. MODEL ANALYSIS AND DEVELOPMENT

Figure 5 shows the results of the SEM analysis of the theoretical model using Amos 23 software.

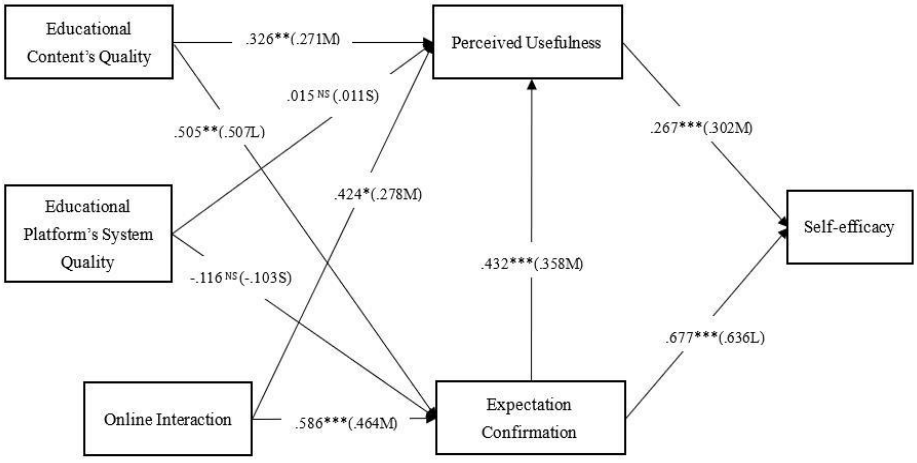

Figure 5: Theoretical Model Analysis

Note: Direct effects are shown using the following notation: The direct unstandardized effect is shown followed by *, **, or *** if the effect is statistically significant at a level of 0.05, 0.01, or 0.001, respectively; NS represents not statistically significant at a level of 0.05 or less. In parentheses the standardized effect is shown with S, M, or L to indicate that the magnitude of the effect is small, medium, or large, respectively.

Table 6: Fit Statistics for Theoretical Model

Model	N	N_c	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
Theoretical model	378	192	629.301/314=2.0041	.046	.875	.850	.894	.944	.943	.055
			R^2: Online Interaction (.591), Expectation Confirmation (.672), Perceived Usefulness (.701), Self-efficacy (.800)							

From Table 6, it is seen that the modified theoretical model is less than satisfactory particularly with respect to the fit statistics GFI, AGFI, NFI. In addition, the effects (Educational Platform's System Quality-Perceived Usefulness; Educational Platform's System Quality-Expectation Confirmation) shown in Figure 5 are not statistically significant. Consequently, it is desirable to seek a more parsimonious model with improved values for the fit statistics. Additional direct effects suggested by the significant correlations in Table 5 were added and together with the statistically insignificant effects in Figure 5, they were made optional. The specification search facility in Amos 23 was used to evaluate each of the models in the resulting hierarchy of 2^7 =128models produced by these optional direct effects and the model with the best value of NC was selected as the final model. The final model, which emerged from this analysis is shown in Figure 6.

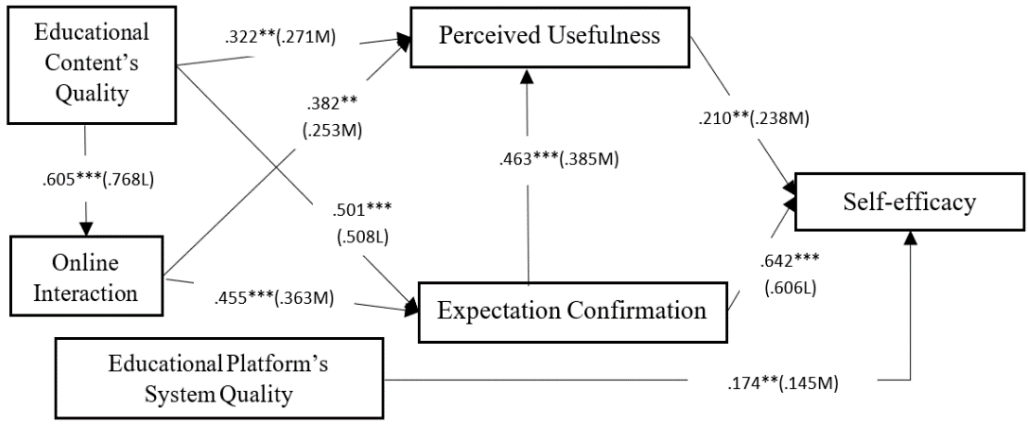

Figure 6: Final Model

Note: Direct effects are shown using the following notation: The direct unstandardized effect is shown followed by *, **, or *** if the effect is statistically significant at a level of 0.05, 0.01, or 0.001, respectively; ^{NS} represents not statistically significant at a level of 0.05 or less. In parentheses the standardized effect is shown with S, M, or L to indicate that the magnitude of the effect is small, medium, or large, respectively.

Table 7: Fit Statistics for Final Model

Model	N	N_c	NC (χ^2/df)	RMR	GFI	AGFI	NFI	IFI	CFI	RMSEA
Final model	378	204	587.315/312=1.88242	.041	.883	.858	.901	.951	.951	.051
			R^2: Expectation confirmation (.691), Perceived usefulness (.707), Self-efficacy (.798)							

From Table 7, it is seen that the final model has an acceptable set of fit statistics and that very reasonable proportions of the variance associated with the endogenous variables are explained by the model. Further systematic dropping and adding of variables and effects based on significant correlation coefficients and the statistical significance and magnitude of other effects did not improve the fit of the final model and so this model was accepted and analyzed in full detail.

Total effects summary of final model

Table 8 presents that the final research model is a single-cluster with educational content's quality, educational platform's system quality, online interaction, perceived usefulness, expectation confirmation and all have positive effects on the dependent variable of self-efficacy. The largest indirect effects on self-efficacy come from educational content's quality while the other three variable's medium effect on self-efficacy comes from online interaction, perceived usefulness and educational platform's system quality. Expectation confirmation also presents a large direct effect on self-efficacy.

New findings

There are new findings that are summarized in Table 9. These new findings relate to direct and indirect effects, and are included in the discussion in model analysis and development.

Table 8: Total Effects Summary of Final Model

Causal variable	Affected variable			
	Online interaction	**Perceived usefulness**	**Expectation confirmation**	**Self-efficacy**
Educational content's quality	Large Only direct	Large Mainly indirect	Large Mainly direct	Large Only indirect
Educational platform's system quality	Nil	Nil	Nil	Medium Only direct
Online interaction	Nil	Medium Only direct	Medium Only direct	Medium Only indirect
Expectation confirmation	Nil	Medium Only direct	Nil	Large Mainly direct
Perceived usefulness	Nil	Nil	Nil	Medium Only direct

Table 9: Summary of New Findings

New findings
Direct causal effects:
Educational Content's Quality has a significant positive direct effect on Online Interaction
Educational Platform's System Quality has a significant positive direct effect on Self-efficacy
Indirect causal effects:
Educational Content's Quality has a significant positive indirect effect on Self-efficacy
Online Interaction has a significant positive indirect effect on Self-efficacy

6. CONCLUSIONS AND RECOMMENDATIONS

The theoretical constructs and relationships gleaned from related literatures were examined in this present research, which were used to formulate the theoretical model for the factors affecting self-efficacy in online education process. The most important findings from a practical perspective provide many pieces of evidence and directions for the instructors and operators of online educational platform. For further understanding, the hierarchy of objectives based on the model findings has been deconstructed, and each associated hierarchy of actions for each hierarchy of objectives is presented in Table 10.

Table 10: Practical Objective and Actions

Objective	Action	Associated model construct
Primary objective: *To increase the perception of self-efficacy*	Ensure the participators perceive what they get from using online educational platform is much more valuable than the things they expect and needs.	Expectation confirmation
	Ensure the participators perceive online educational platform's system operation fit their operational requirement.	Online educational platform's system quality
	Ensure the participators perceive usefulness from what they get from online educational platform.	Perceived usefulness
	Ensure the participators perceive what they learn from online educational program meets their requirements.	Online educational content's quality
	Ensure the actives are organized by the online educational platform can attractive more participators to share their understanding.	Online interaction
Secondary objective 1: *To increase the perception of online interaction*	Ensure what the participators learn from online educational programs stimulate their requirements and desire performance.	Online educational content's quality
	Ensure the instructors' teaching process can stimulate the participators' knowledge-seeking desire.	
Secondary objective 2: *To increase the perception of perceived usefulness*	Ensure the participators perceive what they learn from online educational programs is useful for their learning requirement.	Online educational content's quality
	Ensure the participators' learning process in online educational program stimulate them to improve their learning performance.	Online Interaction
	Ensure the participators' expectations and needs can be achieved.	Expectation confirmation
Secondary objective 3: *To increase the perception of expectation confirmation*	Ensure the participators perceived what they learn from online educational programs achieve their expectation and needs.	Online educational content's quality
	Ensure the relevant interaction behavior between the participators and online educational platforms can increase the possibility to achieve their expectation and needs.	Online interaction

In summary, the meaning of educational content in online educational platform is different from traditional teaching resources in school. The result of this present study suggests that the method in meeting the participator's academic requirements and needs directly drives the direction of course designing and development. The attractive content of the academic subject influences the participator's cognition and conceptual change. This means that a well-designed educational content constantly satisfies the exchange of knowledge between the instructor and participator, which is supposed to be the same in online education platforms. This is because it was demonstrated that the use of technology, no matter what it is, does not necessarily affect learning but it is on how the courses are designed and how the contents are digested. Additionally, the online educational platform system should be customized for the needs of the participators and it should be designed that fit their operational requirements.

However, it is recommended that this present research should be replicated using the same environment and population as the external validity is its main limitation. But since this present research was conducted in China, which has the highest number of internet usage in the world, it is also strongly recommended that future researches should be conducted in countries where internet usage and online education is still in its developing stage. This will provide relevant information regarding the distinct differences among these countries with regard to their perception about the use of internet technology in learning. There are still more reasonable factors that affect online educational participator's self-efficacy, which are worthy to study because this present research did not include all possible causal effects. It is hence recommended to study other relevant factors that involve online platforms and self-efficacy.

REFERENCES

Abbatt, F. and McMahon, R. (1993). *Teaching Health Care Workers*. Basingstoke: MacMillan.

Ally, M. (2008). Foundations of educational theory for online learning. In *The Theory and Practice of Online Learning*. 2nd ed. edited by T. Anderson, pp. 15-44. Athabasca, Alberta: Athabasca University Press. [Online URL: https://www.aupress.ca/app/uploads/120146_99Z_Anderson_2008-Theory_and_Practice_of_Online_Learning.pdf] accessed on February 21, 2020.

Al-Mamary, Y. H., Shamsuddin, A. and Aziati, N. (2014). The relationship between system quality, information quality, and organizational performance. *International Journal of Knowledge and Research in Management and E-Commerce* 4(3): 7-10.

Anderson, T. D. and Garrison, R. D. (1998). Learning in a networked world: New roles and responsibilities. In *Distance Learners in Higher Education: Institutional Responses for Quality Outcomes*, edited by C. C. Gibson, pp. 97-112. Madison, Wisconsin: Atwood Publishing.

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly* 25(3): 351-370.

Blau, P. M. (1964). *Exchange and Power in Social Life*. New York: Wiley.

Brown, J., Broderick, A. J. and Lee, N. (2007). Word of mouth communication within online communities: Conceptualizing the online social network. *Journal of Interactive Marketing* 21(3): 2-20.

Chang, H. H. and Wang, I. C. (2008). An investigation of user communication behavior in computer mediated environments. *Computers in Human Behavior* 24(5): 2336-2356.

Chen, J., Cong, F. and Kang, F. (2009). Influential factor analysis of consumers' online purchase behavior: A flow approach. *Nankai Business Review* 12(2):132-140.

Chen, K., and Yen, D. (2004). Improving the quality of online presence through interactivity. *Information and Management* 42(1): 217-226.

Cronin, J. J., Brady, M. K. and Hult, G. T. M. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments. *Journal of Retailing* 76(2): 193-218.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 13(3): 319-340.

Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science* 35(8): 982-1003.

Debatin, B., Lovejoy, J., Horn, A. and Hughes, B. (2009). Facebook and online privacy: attitudes, behaviors, and unintended consequences. *Journal of Computer-Mediated Communication* 15(1): 83-108.

DeLone, W. H. and McLean, E. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems* 19(4): 9-30.

Downes, S. and Siemens, G. (2008). *CCK08 – The Distributed Course*. [Online URL: https://sites.google.com/site/themoocguide/3-cck08---the-distributed-course] accessed on June 11, 2020.

Fathema, N. and Sutton, K. L. (2013). Factors influencing faculty members' Learning Management Systems adoption behavior: An analysis using the technology acceptance model. *International Journal of Trends in Economics Management & Technology* 2(6): 20-28.

Fathema, N., Shannon, D. and Ross, M. (2015). Expanding the Technology Acceptance Model (TAM) to examine faculty use of Learning Management Systems (LMSs) in higher education institutions. *Journal of Online Learning and Teaching* 11(2): 210-233.

George, D. and Mallery, P. (2003). *Using SPSS for Windows Step by Step: A Simple Guide and Reference* 4th ed. London: Pearson Education.

Goodhue, D. L. and Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS Quarterly* 19(2): 213-236.

Kankanhalli, A., Tan, B. C. Y. and Wei, K. (2005). Contributing knowledge to electronic repositories: an empirical investigation. *MIS Quarterly* 29(1): 113-143.

Kim, B. and Han, I. (2009). The role of trust belief in community-driven knowledge and its antecedents. *Journal of the American Society for Information Science & Technology* 60(5): 1012-1026.

Klin, R. B. (2016). *Principles and Practice of Structural Equation Modeling.* 4th ed. New York: The Guilford Press.

Lee, T. (2005). The impact of perceptions of interactivity on customer trust and transaction intentions in mobile commerce. *Journal of Electronic Commerce Research* 6(3): 165-180.

Liu, Y. and Shao, P. (2005). Research on the quality of enterprise B2C web site for E-Commerce. *Value Engineering* (1): 64-67. [in Chinese]

Massey, B. L. and Levy, M. (1999). Interactive, online journalism at English-Language web newspapers in Asia. *Gazette (Leiden, Netherlands)* 61(6): 523-538.

Molm, L. D. (2001). Theories of social exchange and exchange networks. In *Handbook of Social Theory*, edited by G. Ritzer and B. Smart, pp. 260-272. London: SAGE Publications.

Moore, M. G. and Kearsley, G. (2005). *Distance Education: A Systems View*. Belmont, CA: Thomson Wadsworth.

Moore, M. G. and Kearsley, G. (2012). *Distance Education: A Systems View of Online Learning*. 3rd ed. Belmont, CA: Wadsworth Cengage Learning.

Nahl, D. (2005). *Affective and cognitive information behavior: Interaction effects in Internet use*. Proceedings of the 68th ASIS&T Annual Meeting, ASIST 2005. Charlotte, North Carolina: Wiley. [Online URL: https://asistdl.onlinelibrary.wiley.com/doi/10.1002/meet.1450420196] accessed on January 21, 2019.

Okafor, D. J., Nico, M. and Azman, B. B. (2016). The influence of perceived ease of use and perceived usefulness on the intention to use a suggested online advertising workflow. *Canadian International Journal of Science and Technology* 6(14): 162-174.

Pettigrew, K. E. (1999). Waiting for chiropody: contextual results from an ethnographic study of the information behavior among attendees at community clinics. *Information Processing & Management* 35(6): 801-817.

Pianta, R. C. (1999). *Enhancing Relationships Between Children and Teachers*. Washington, DC: American Psychological Association.

Popoola, B. A., Chinomona, R. and Chinomona, E. (2014). The influence of information quality, system quality and service quality on student's self-efficacy at institutions of higher learning in South Africa. *Mediterranean Journal of Social Sciences* 5(27): 974-984.

Roaimah, O., Ramayah, T., May-Chuin, L., Tan, Y. S. and Rusinah, S. (2010). Information sharing, information quality and usage of information technology (IT) tools in Malaysian organizations. *African Journal of Business Management*. 4(12): 2486-2499.

Shaari, R., Rahman, S. A. A. and Rajab, A. (2014). Self-Efficacy as a determined factor for knowledge sharing awareness. *International Journal of Trade, Economics and Finance* 5(1): 39-42.

Skadberg, Y. and Kimmel, J. (2004). Visitors' flow experience while browsing a Web site: its measurement, contributing factors and consequences. *Computers in Human Behavior* 20(3): 403-422.

Song, J. H. and Zinkhan, G. M. (2008). Determinants of perceived web site interactivity. *Journal of Marketing* 72(2): 99-113.

Stephanie, L. S. (2013). *The Effect of Teacher-Student Relationships on the Academic Achievement of Fifth Grade Students*. Master's thesis. Goucher College, USA.

Stones, E. (1966). *An Introduction to Educational Psychology*. London: Methuen.

Straub, D., Boudreau, M. and Gefen, D. (2004). Validation guidelines for IS positivist research. *Communications of the Association for Information Systems* 13: Article 24.

Tang, L. and Deng, S., (2012). The factors influence on social networking services user's loyalty behavior. *Document, Information and Knowledge* 1: 102-108. [in Chinese]

Torres, J. A. S., Arroyo-Cañada, F.-J., Solé-Moro, M.-L. and Argila-Irurita, A. (2018). Impact of gender on the acceptance of electronic word-of-mouth (eWOM) information in Spain. *Contaduría Y Administración* 63(4): 1-19.

Wiener, D. N. (1948). Subtle and obvious keys for the Minnesota multiphasic personality inventory. *Journal of Consulting Psychology* 12(3): 164-170.
Wu, J. and Chang, Y. (2005). Towards understanding members' interactivity, trust, and flow in online travel community. *Industrial Management & Data Systems* 105(7): 937-954.
Yang, Z. (2011). The analysis of SNS website quality evaluation's basic indicators set. *Science and Technology Information* 14(10): 390. [in Chinese]