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Understanding the relationships of critical factors to Facebook educational usage intention

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Abstract

Purpose – The purpose of this paper is to conceptualise a framework that integrates information quality, system quality, function quality, and social influence based on the information system (IS) success model, to explore the relationship among these factors, which might be the key determinants of Facebook educational usage intention.

Design/methodology/approach – An internet survey was conducted to collect empirical data from 221 Facebook users on their experiences of using Facebook. This study applied structural equation modeling (SEM) to demonstrate the proposed model's construct relations and multiple group analysis.

Findings – The results of this study show that social influence and information quality are critical and direct determinants that affect users' continuous intention to use Facebook in learning; social influence also indirectly affect Facebook usage intention through the mediating effect of information quality. Except the path between social influence and usage intention in age subgroups, the relationships among these determining factors in the proposed model are stable, and there were no significant differences among gender subgroups and age subgroups examined using the multiple group comparison test.

Originality/value – The findings provide a better understanding of the IS success model that influences the Facebook educational usage intention for researchers and practitioners.

Keywords Facebook, Education, Social networks, Information systems success model, Social influence

Paper type Research paper

1. Introduction

1.1 Growth of Facebook: everywhere but in learning and education?

Currently, there are few studies on social networking sites (SNSs) although several studies on this subject have focused on identification, network structures, privacy, electronic commerce, and technological issues and, therefore, the need for research on SNSs in educational usages is now widely acknowledged (Mazman and Usluel, 2010; Lockyer and Patterson, 2008; Hsu *et al.*, 2012). SNSs such as Facebook are successful virtual community communications technologies that have been widely adopted by students and, consequently, have the potential to become a valuable resource to support their educational communications and collaborations with faculty (Roblyer *et al.*, 2010) as e-learning tools in adult education (Lohse, 2013; Lin *et al.*, 2013) or in

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higher education (Said and Tahir, 2013; Jong *et al.*, 2014; Amador and Amador, 2014; Roblyer *et al.*, 2010; Pérez *et al.*, 2013; Aydin, 2014; Arteaga Sánchez *et al.*, 2014). Further, such technologies provide ways to acquire new knowledge via collaborative learning (Rau *et al.*, 2008; Hsu *et al.*, 2012) and interactions (Aydin, 2014). An existing study on Facebook use suggests that students primarily use it to enhance social connectedness, but seldom for educational purposes (Jong *et al.*, 2014).

Facebook is a social networking service that was launched in February 2004, and is owned and operated by Facebook Inc. Among internet applications, Facebook has grown tremendously since 2004 (Ko, 2013). Facebook is one of the most popular online SNSs among the youth and university students (Mauri *et al.*, 2011; Roblyer *et al.*, 2010). Learning (including assistance in completing schoolwork) is one of nine motives for Facebook use (Hew, 2011; Bosch, 2009; Pempek *et al.*, 2009). A comparison survey of faculty and student indicates that students are much more likely than faculty to use Facebook and significantly more open to the possibility of using it and similar technologies to support classroom work (Roblyer *et al.*, 2010). Learners can use SNSs in educational usage for connectivity and social support, collaborative information discovery and idea sharing, content creation, and knowledge and information aggregation and modification (Lee and McLoughlin, 2008). However, few studies have considered that other possible factors such as gender and age may affect users' acceptance and adoption of Facebook to support learning tasks in schools. Further, the identification of critical factors and the manner in which their relationships are perceived in educational usage are issues that are still awaiting researchers' interest.

1.2 Information system (IS) acceptance and usage intention evaluation models

Numerous previous studies have modified and used the IS success model or technology acceptance model (TAM) to measure the acceptance level of information technology usage (DeLone and McLean, 2003; Hsu and Lu, 2004; Rivis and Sheeran, 2003; Yang *et al.*, 2010; Lee *et al.*, 2012; Wang and Lin, 2011; Dong *et al.*, 2014). However, additional explanatory constructs such as social influence (Yang *et al.*, 2010; Al-Debei *et al.*, 2013), information quality (Wang and Lin, 2011), system quality (Wang and Lin, 2011), function quality (Wang and Lin, 2011), or social psychology (Amy *et al.*, 2011) may be required to explain or measure the acceptance level of specific internet technologies (Yang *et al.*, 2010; Wang and Lin, 2011; Amy *et al.*, 2011). Future technology acceptance studies should consider how other possible factors influence user acceptance intention because these factors probably vary with technology, user, and context (Davis *et al.*, 1989). Empirical evidence shows that the more favorable that attitudes and social influences (such as subjective norms, peer norms, and critical mass) are toward a behavior, the stronger is the intention to perform a behavior (Fishbein and Ajzen, 1975).

1.3 Research purpose and questions

This study uses the IS success model as the structural model to explore the relationship between social influence, Facebook platform qualities (information quality, system quality, and function quality), and usage intention to understand the impact that social influence exerts on Facebook education usage intention. In addition, this study adopts multiple group comparison analysis to identify relationships between the critical factors influencing the adoption of Facebook in educational usage among

gender subgroups and age subgroups. Therefore, this study proposed the following research questions:

RQ1. What is the relationship between critical factors affecting students' use of Facebook in education?

RQ2. How do male and female students' perspectives compare on the use of Facebook in education?

RQ3. How do younger and older students' perspectives compare on the use of Facebook in education?

2. Theoretical background and research hypotheses

This section presents the theoretical background and literature review to develop the conceptual model and research hypotheses. This study investigated the applicability of DeLone and McLean's (2003) modified IS success model to explore the learner acceptance of Facebook. The model revealed that a system can be evaluated in terms of information, system, function, and service quality.

2.1 Information quality

Information quality is defined as a user's perception of the collective content quality of a specific network service (Wang and Lin, 2011). Past studies have proven that information quality can influence factors related to IS success (DeLone and McLean, 1992; DeLone and McLean, 2004), such as usage intention and IS use of application service provider services (Lee *et al.*, 2007), blogs (Wang and Lin, 2011), virtual communities (Lin and Lee, 2006), and Facebook (Dong *et al.*, 2014); therefore, the following hypothesis is proposed:

H1. The extent of Facebook users' perceived Facebook information quality is positively related to their usage intention.

2.2 System quality

System quality plays an important role, and positively affects user intentions to use ISs (DeLone and McLean, 2004; Gu *et al.*, 2010; Wang and Lin, 2011; Chen, 2007), web-based learning services (Chiu *et al.*, 2007), virtual communities (Lin and Lee, 2006; Chen, 2007), blogs (Wang and Lin, 2011), and Facebook (Mazman and Usluel, 2010). Studies have examined the ease of use, reliability, flexibility, and responsiveness to measuring system quality (DeLone and McLean, 2004; Gu *et al.*, 2010; Mazman and Usluel, 2010). System quality reflects the expected performance or desired characteristics of an IS (DeLone and McLean, 2003; Lee *et al.*, 2007; Gu *et al.*, 2010; Dong *et al.*, 2014). Therefore, higher user-perceived system quality reflects an enhanced intention to use (Wang and Lin, 2011; Yang *et al.*, 2010; Gu *et al.*, 2010; Mazman and Usluel, 2010). Thus, the following hypothesis is proposed:

H2. The extent of Facebook users' perceived Facebook system quality is positively related to their usage intention.

2.3 Facebook function quality

Facebook contains numerous applications and games, such as the timeline, photo album, fan pages, groups, and "happy farms." Further, it provides an application programming interface (API) that allows users to incorporate multimedia content, Flash ActionScript, and other programming languages to enhance its appearance and functions. Research has shown that richer and more useful blog functions strengthen

user perceptions of blog function quality (Wang and Lin, 2011); thus, the following hypothesis is proposed:

H3. The extent of Facebook users' perceived Facebook function quality is positively related to their usage intention.

2.4 Social influence

Social influence has been shown to affect people's perceptions of IS quality (Chen, 2007), information quality (Wang and Lin, 2011), system quality (Wang and Lin, 2011), and function or quality of SNS (Wang and Lin, 2011). Thus, the following hypotheses are proposed:

H4. The extent of Facebook users' perceived social influence of Facebook is positively related to perceived information quality.

H5. The extent of Facebook users' perceived social influence of Facebook is positively related to perceived system quality.

H6. The extent of Facebook users' perceived social influence of Facebook is positively related to perceived function quality.

Numerous studies over the past years have shown that social influence significantly affects users and steers them toward a certain behavior (Hsu and Lu, 2004; Wang and Lin, 2011; Chang and Cheung, 2001; Liker and Sindi, 1997; Song and Kim, 2006; Grandon *et al.*, 2005; Nysveen *et al.*, 2005; Hsu and Chiu, 2007; Yang *et al.*, 2010; Chen, 2007; Cheung *et al.*, 2011; Mazman and Usluel, 2010; Chen *et al.*, 2012). Social influence reflects perceived pressure to use technology (Venkatesh *et al.*, 2003; Chen, 2007; Yang *et al.*, 2010) and Facebook (Mazman and Usluel, 2010; Dong *et al.*, 2014). Social influence directly affects the intention to use internet technologies (Lin and Anol, 2008; Chen, 2007; Cheung *et al.*, 2011), blogs (Wang and Lin, 2011), online videos (Yang *et al.*, 2010), and continuing Facebook usage (Dong *et al.*, 2014). In addition, social influence has been proven to indirectly affect the usage intention in social network services (Kwon and Wen, 2010; Wang and Lin, 2011; Dong *et al.*, 2014) and educational Facebook usage (Mazman and Usluel, 2010). Therefore, this study proposes *H7*:

H7. The extent of Facebook users' perceived social influence of Facebook is positively related to their usage intention.

3. Research design

The questionnaire items in this study were based on previous studies (Wang and Lin, 2011; DeLone and McLean, 2003; Hsu and Lu, 2004; Rivis and Sheeran, 2003). The questionnaire was divided into two parts. The first part used nominal scales to collect demographic information, including gender, age, education level, occupation, and Facebook experience. The second part measured social influence, information quality, system quality, function quality, and intention to use Facebook services. Each item was measured on a five-point Likert scale from strongly disagree (1) to neutral (3) to strongly agree (5). To ensure content validity, all measurement items used in the survey were modified and validated using relevant research. The construct and source measurement items included: social influence (Wang and Lin, 2011; Hsu and Lu, 2004; Rivis and Sheeran, 2003), information quality (Wang and Lin, 2011; DeLone and McLean, 2003), system quality (DeLone and McLean, 2003; Wang and Lin, 2011), function quality (Wang and Lin, 2011), and usage intention (Hsu and Lu, 2004; Wang and Lin, 2011).

To ensure the reliability and validity of the measurements, a pretest was conducted on five graduate school students and two Digital Content and Information Management professors over ten days. All measurement items were repeatedly modified using pretests. To test the hypotheses, an online survey was conducted to collect empirical data. To increase the response rate of participants, we placed survey messages on the popular online survey web site-My3Q (www.my3q.com/) and posted invitations for the survey on several popular BBS forums. All participants were required to have Facebook accounts and experience in using Facebook. At the culmination of the survey after two months, we had collected data from 221 Facebook participants.

An analysis of the demographic profiles of the respondents reveals that there were 45.2 percent male and 54.8 percent female respondents. Approximately 50.7 percent of the respondents were less than 26 years old while 33 percent of the respondents were aged 26-35 and 16.3 percent were older (age $>$ 35 years old). More than half of the respondents (88.2 percent) had a bachelor's degree, Master's degree, or a higher degree, and had more than one year's experience of using Facebook.

4. Data analysis results

4.1 Confirmatory factor analysis (CFA)

CFA was conducted to assess the model fit criteria, reliability, convergent validity, and discriminant validity (Table I). AMOS 20.0 was used to estimate four common goodness-of-fit criteria to determine the model's overall goodness-of-fit. These included the relative χ^2 (χ^2/degrees of freedom), Comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA). Table II shows that all goodness-of-fit criteria satisfied the acceptance levels established by the relevant research, indicating that the measurement model was appropriate for the collected data.

Composite reliability and Cronbach's coefficient α results were used to examine reliability. Table III shows that the composite reliability and Cronbach's coefficient α for each factor is higher than 0.7, indicating that all items in each latent variable form a strongly cohesive construct (Nunnally and Bernstein, 1994).

	SN	IQ	SQ	FQ	UI
SI	1.00				
IQ	0.54	1.00			
SQ	0.37	0.39	1.00		
FQ	0.71	0.39	0.27	1.00	
UI	0.81	0.63	0.31	0.62	1.00

Table I. Correlation coefficient matrix

Notes: SI, social influence; IQ, information quality; SQ, system quality; FQ, function quality; UI, usage intention

Fit index	Recommended criteria	Measurement model	Structural model
χ^2/df	< 3.0	1.84	2.07
CFI	> 0.95	0.94	0.93
TLI	> 0.95	0.93	0.91
RMSEA	< 0.06	0.07	0.07

Table II. Measurement and structural model goodness-of-fit indices

Table III.
Reliability analysis and convergent validity

Construct	Scale item	Standardized factor loading (*t*-value)	Cronbach's α	CR
Social influence (SI)	SI1: I think the number of Facebook members in learning is large	0.77 (12.91)	0.89	0.88
	SI2: Many people around me use the Facebook in learning	0.76 (15.02)		
	SI3: People of the same interests as me use the Facebook in learning	0.89 (11.72)		
	SI4: People who are important to me think that I should use Facebook in learning	0.83 (13.38)		
Information quality (IQ)	IQ1: The Facebook provide correct learning information	0.77 (10.04)	0.76	0.77
	IQ2: The learning information provided in Facebook is useful to me	0.61 (9.42)		
	IQ3: The learning information provide in Facebook in complete	0.78 (10.11)		
System quality (SQ)	SQ1: The system of Facebook in learning is stable	0.60 (8.42)	0.73	0.73
	SQ2: The System of Facebook in learning is easy to use	0.70 (8.91)		
	SQ3: The system of Facebook in learning is user friendly	0.67 (9.94)		
	SQ4: The response time of Facebook system in learning is acceptable	0.58 (8.42)		
Function quality (FQ)	FQ1: The Facebook provides various templates for users to customize their layouts	0.69 (8.18)	0.78	0.71
	FQ2: The Facebook provides functions for data access privileges management	0.61 (7.01)		
	FQ3: The Facebook provides good searching functions	0.76 (9.76)		
	FQ4: The Facebook provides rich multimedia playback functions	0.57 (8.07)		
	FQ5: The Facebook provides plenty of extensions for user to develop their own functions (e.g. Javascript, third-party plug-ins)	0.63 (9.61)		
Usage intention (UI)	UI1: It is worth using the Facebook in learning	0.88 (16.52)	0.92	0.91
	UI 2: I will continue to use the Facebook in learning in the future	0.91 (17.49)		
	UI 3: I will recommend other to use the Facebook in learning	0.91 (17.26)		
	UI 4: In comparison with other SNS, I will stay with the Facebook in learning	0.74 (12.69)		

Convergent validity was assessed using composite reliability and the statistical significance of item factor loadings. As shown in Table II, composite reliability for all CFA constructs is above 0.7. All item factor loadings for the proposed constructs were significant (t values ranged from 7.01 to 17.49). Thus, all constructs exhibited acceptable convergent validity.

4.2 Structural model analysis

The same set of goodness-of-fit criteria was used to examine the structural model. As shown in Table II, the structural model also fits the empirical data well. Thus, structural model path analysis could be conducted.

Figure 1 shows the estimated results of the causal paths, including standardized path coefficients, critical ratios (t values), and explained variance (R^2) for each path in the research model. The results show that two hypotheses are not supported (*H2* and *H3*), but *H1*, *H4*, *H5*, *H6*, and *H7* are all supported at a 0.05 significance level.

In the proposed research model, social influence indirectly affects behavioral intention through the mediation of information quality. The Sobel test (Sobel, 1982) was used to estimate the statistical significance of the mediation effect. In addition, PRODCLIN, proposed by MacKinnon *et al.* (2007), was used to generate asymmetric confidence intervals (MacKinnon *et al.*, 2007). The Sobel test indicated that the mediating effects were significant with p-value < 0.05. The 95 percent asymmetric confidence intervals for this indirect effect did not include a zero, ranging from 0.04 to 0.28, thereby confirming the existence of the mediation effect.

4.3 Multiple group comparison test

Two constructs may possibly have different moderating effects on TAM relationships. Therefore, the present study investigated the effects of various gender subgroup and age subgroup concerns in using Facebook for educational purposes via multiple group analysis. The purpose of the multiple group comparisons test was to evaluate whether the path coefficients were different across the two gender subgroups and three different age subgroups (Calantone and Zhao, 2001; Gu *et al.*, 2010). To test multiple group comparison, we adopted the analytical strategy of Singh (1995) and Gu *et al.* (2010) to

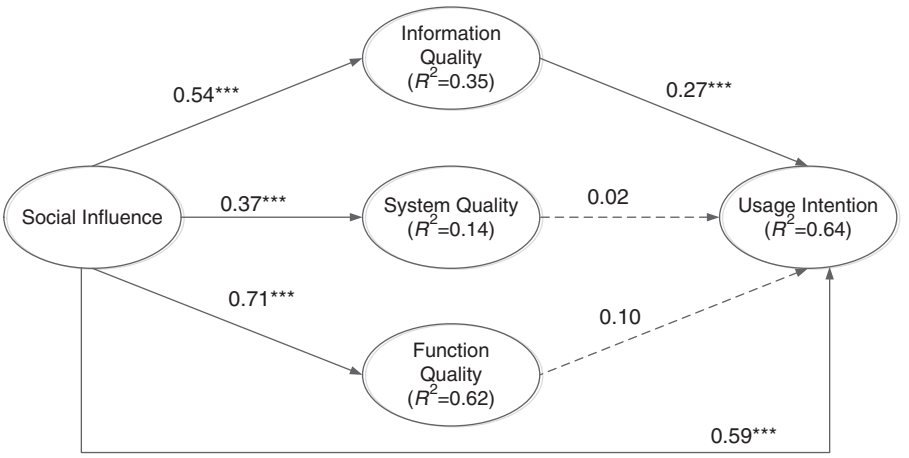


Figure 1.
Standardized solution of structural modeling analysis

Notes: *p-value <0.05; **p-value <0.01; ***p-value <0.001

examine the existence of the multiple group difference on the structural model. The test results for structural models and subgroup analysis are presented in Tables IV and V. Based on the subgroup analysis in Table IV, none of the moderating effects is observed. The results of the multi-group comparison test indicated that the path coefficients were not significantly different in the χ^2 testing between the male group and the female group. In Table V, the effects of social influence on usage intention are confirmed to differ according to age while the remaining paths are not. The results shown that the relationships among these critical factors that affect Facebook education intention are stable and do not significantly differ between the two gender subgroups . The results of the structural equation models are also presented in Figures 2 and 3.

For the relationship between system quality and usage intention, the youngest subgroup (age < 26) has a positive and slightly higher path coefficient than the other age subgroups (age 26-35 and age > 36). This difference shows that, for the youngest users (age < 26), the perceived system quality will have a stronger (in fact, statistically insignificant) influence on their Facebook educational usage intention (SQ construct mean values: 3.54 vs 3.38 vs 3.36). In other words, the youngest Facebook users perceived higher system quality in Facebook than that perceived by the other two age

Path	Male group Standardized coefficient (*t*-value)	Female group Standardized coefficient (*t*-value)	Subgroup comparison (Unconstrained $\chi^2 = 565.00$, df = 326) Constrained χ^2 (df = 327)	χ^2 difference	Results
IQ→UI	0.27**	0.32***	565.02	0.013	M = F
SQ→UI	0.01	−0.04	565.23	0.228	M = F
FQ→UI	0.14	0.03	566.40	1.396	M = F
SI→IQ	0.59***	0.54***	565.24	0.236	M = F
SI→SQ	0.39**	0.34**	566.19	1.182	M = F
SI→FQ	0.71***	0.72***	565.46	0.451	M = F
SI→UI	0.54***	0.60***	565.77	0.759	M = F

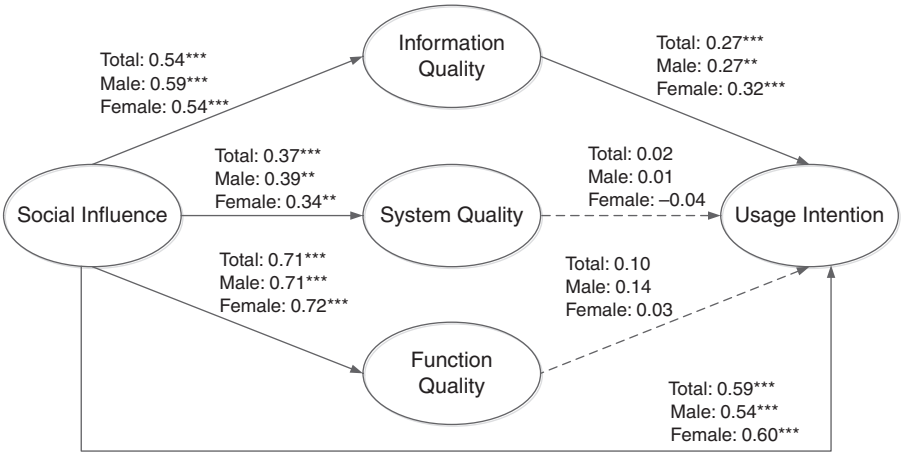
Notes: M, male group; F, female group; *p-value < 0.05; **p < 0.01; ***p < 0.001

Table IV. Path coefficients and χ^2 difference across gender

Path	Age smaller than 26 years old	Age 26-35 years old	Age larger than 35 years old	Subgroup comparison (unconstrained $\chi^2 = 804.31$, df = 489) Constrained χ^2 (df = 491)	χ^2 difference	Results
	Standardized coefficient (*t*-value)					
IQ→UI	0.41***	0.22*	0.15*	806.41	2.10	No difference
SQ→UI	0.02	−0.07	−0.11	805.03	0.72	No difference
FQ→UI	−0.01	−0.03	0.09	805.14	0.83	No difference
SI→IQ	0.55***	0.49***	0.48**	807.69	3.38	No difference
SI→SQ	0.38***	0.30*	0.67*	808.04	3.73	No difference
SI→FQ	0.60***	0.82***	0.74***	804.56	0.25	No difference
SI→UI	0.45***	0.78***	0.81***	813.59	9.28	**

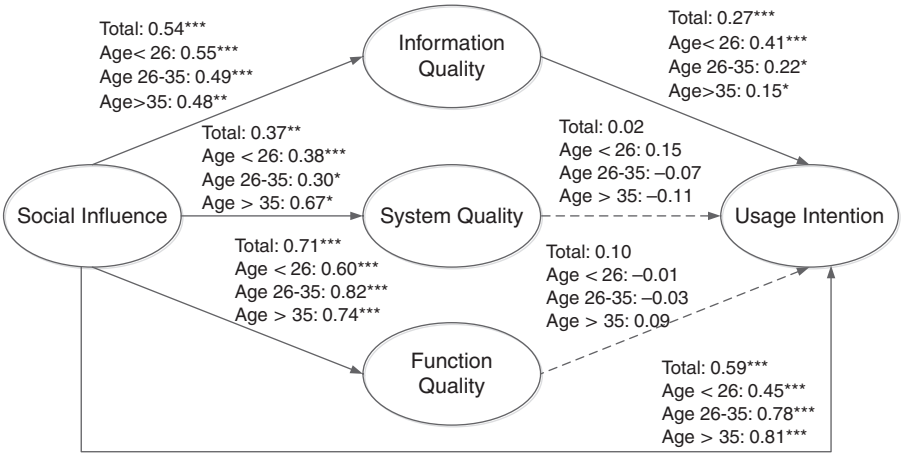
Notes: *p < 0.05; **p < 0.01; ***p < 0.001

Table V. Path coefficients and χ^2 difference across age



Notes: *p-value <0.05; **p-value <0.01; ***p-value <0.001

Figure 2.
Gender difference of proposed research model (standardized coefficients)



Notes: *p-value <0.05; **p-value <0.01; ***p-value <0.001

Figure 3.
Age difference of proposed research model (standardized coefficients)

subgroups. For these two age subgroups, users perceived lower system quality in ease of use (mean values: 3.04 vs 2.99 vs 3.31) and user friendliness (mean values: 3.34 vs 3.03 vs 3.25), as shown in Table VI. Besides, the oldest agesubgroup perceived lower satisfied response time of Facebook for learning (mean values: 3.71 vs 3.70 vs 3.28). One possible explanation is that the younger age subgroup is usually familiar with the operation of new social media technologies than the older age subgroups. However, the older age subgroups may pay more attention to the response time for learning, and feel less satisfied about the Facebook user interface.

In contrast to the abovementioned relationship, for the relationship between function quality and usage intention, the oldest age subgroup (age $>$ 35) has a positive and slightly higher path coefficient than the two younger subgroups (age $<$ 26 and age

Table VI. Mean and standardized deviation of each item for different age group

Items		Age < 26 Mean	Age < 26 SD	Age (26-35) Mean	Age (26-35) SD	Age > 35 Mean	Age > 35 SD
Social influence (SI)		3.28	0.97	3.08	1.02	3.52	1.07
SI1	I think the number of Facebook members in learning is large	3.54	1.05	3.22	1.04	3.64	1.05
SI2	Many people around me use the Facebook in learning	3.40	0.98	3.03	0.93	3.58	1.08
SI3	People of the same interests as me use the Facebook in learning	3.27	0.93	3.12	1.03	3.53	1.06
SI4	People who are important to me think that I should use Facebook in learning	2.91	0.93	2.93	1.07	3.33	1.10
System quality (SQ)		3.54	0.92	3.38	1.04	3.36	1.04
SQ1	The system of Facebook in learning is stable	4.06	0.83	3.79	0.96	3.61	0.99
SQ2	The system of Facebook in learning is easy to use	3.04	0.98	2.99	1.11	3.31	1.09
SQ3	The system of Facebook in learning is user friendly	3.34	1.00	3.03	1.18	3.25	1.00
SQ4	The response time of Facebook system in learning is acceptable	3.71	0.86	3.70	0.91	3.28	1.09
Information quality (IQ)		3.03	0.74	3.03	0.92	3.24	0.94
IQ1	The Facebook provide correct learning information	2.74	0.81	2.84	0.97	3.14	1.18
IQ2	The learning information provided in Facebook is useful to me	3.50	0.67	3.45	0.80	3.56	0.84
IQ3	The learning information provide in Facebook in complete	2.84	0.74	2.79	0.99	3.03	0.81
Function quality (FQ)		3.19	0.93	3.03	0.98	3.61	1.03
FQ1	The Facebook provides various templates for users to customize their layouts	2.99	0.95	2.97	0.85	3.47	1.00
FQ2	The Facebook provides functions for data access privileges management	3.13	1.08	2.89	1.28	3.33	1.15
FQ3	The Facebook provides good searching functions	2.98	0.88	2.82	1.06	3.67	1.07
FQ4	The Facebook provides rich multimedia playback functions	3.76	0.79	3.60	0.80	4.03	0.91
FQ5	The Facebook provides plenty of extensions for user to develop their own functions	3.10	0.97	2.89	0.91	3.56	1.00
Usage intention (UI)		3.42	0.84	3.32	0.94	3.82	0.96
UI1	It is worth using the Facebook in learning	3.56	0.76	3.41	0.91	3.89	0.95
UI2	I will continue to use the Facebook in learning in the future	3.39	0.81	3.27	0.92	3.89	1.04
UI3	I will recommend other to use the Facebook in learning	3.27	0.84	3.22	0.90	3.78	0.87
UI4	In comparison with other SNS, I will stay with the Facebook in learning	3.47	0.94	3.37	1.01	3.72	0.97

26-35). This difference shows that, for the oldest users, the perceived function quality will have a stronger (in fact, statically insignificant) influence on their Facebook educational usage intention. In other words, the oldest age subgroup of Facebook users (age > 35) perceived a higher function quality in Facebook than the perceived function quality in the two younger age subgroups (FQ construct mean values: 3.19 vs 3.03 vs 3.61). For these two younger age subgroups (age < 26 and age 26-35), users perceived lower function quality, especially in the function of providing various customized templates (mean values: 2.99 vs 2.97 vs 3.47), functions for data access privileges management (mean values: 3.13 vs 2.89 vs 3.33), good search functions (mean values: 2.98 vs 2.82 vs 3.67), and the function of extending their own functions (mean values: 3.10 vs 2.89 vs 3.56) (as shown in Table VI). The two younger age subgroups perceived a lower function quality than the oldest age subgroup. One possible explanation is that the younger age subgroups are usually seeking the newest functions (such as customized layouts or styles in Facebook) and are likely to enjoy and use new functions or create their styles in learning. The oldest age subgroup may be more interested in rich multimedia playback functions because of educational and career needs or for getting a job promotion. In contrast, if users already feel that functions in Facebook are easy to use, the function quality will have a weaker effect on their future use (Tan *et al.*, 2012), they will be more likely to seek new functions, and will perceive lower function quality in the current platform.

5. Findings and discussion

The internet, communication technologies, and mobile devices are continuously changing the influence of social networking as a critical channel (Chen *et al.*, 2012; Shen, 2013; Wu *et al.*, 2013). In this study, an IS success structural model is tested to explain the educational use of Facebook. The results of this study generally support the results of previous IS success model studies (Wang and Lin, 2011; Dong *et al.*, 2014) and TAM-related studies (Al-Debei *et al.*, 2013; Lee *et al.*, 2012; Yang *et al.*, 2010). The research results show that social influence and information quality are critical and direct determinants that affect users' continuous intention to use Facebook in learning. Except the path between social influence and usage intention in age subgroups, the relationships of the proposed model are stable, and there were no significant differences among the gender subgroups and the three age subgroups that were examined by the multiple group comparison test.

Consistent with prior studies, social influence has a strong direct and indirect influence and positive effect on continued intention to use Facebook (Chen, 2007; Wang and Lin, 2011; Mazman and Usluel, 2010; Venkatesh *et al.*, 2003; Mauri *et al.*, 2011; Dong *et al.*, 2014; Mazman and Usluel, 2010). Facebook enables social interaction for creating new relationships or strengthening existing relationships in the virtual world as well as in the real world (Dong *et al.*, 2014). People use Facebook as an educational tool to maintain their social relationships and communications with their colleagues, classmates, or people with whom they are studying, exchanging information, and sharing ideas and views during this communication process (Mazman and Usluel, 2010).

Social influence shows a significant impact that positively affects usage intention through information quality. The phenomenon implies that Facebook managers should consider the value of word-of-mouth advertising on social networks, which may increase continuous educational usage intention (Lin and Anol, 2008). If users have positive experiences when they use SNSs in learning, their educational usage

intention increases (Mauri *et al.*, 2011). A previous study suggested that for a new SNS to succeed in attracting a large number of members at an early stage, it must provide the benefits of network externality (Ko, 2013). Therefore, this study proposed that social influence would play a critical role in attracting new users to SNSs, especially in educational usage.

The social learning theory developed by Bandura (1977) proposed that observational learning activities involved four component processes: attention, retention, motor reproduction, and motivation. We believe that the significant effect of social influence supports Bandura's social learning theory (Bandura, 1977) in Facebook. Learners using Facebook can easily pay attention to modeled behavior (attention process), imprint the observed behaviors (e.g. photos and messages in Facebook) to memory in a symbolic form (retention), reproduce Facebook learners' behavior (reproduction), and finally, are more likely to adopt modeled Facebook learners' behaviors (motivation). In addition, social media learning allows learners to learn from online modelers through mobile devices such as smart phones or tablets.

The issue of how Facebook may be used to help students learn more effectively has been investigated recently. Past study proposed that four important educational aspects (convenience in sharing educational resources, immediacy of learning what teachers posted on the internet, reviewing past articles on a given topic, and interaction with other users) are distinguishable potential educational values between a potential and readily usable education platform (Jong *et al.*, 2014). As an educational tool, Facebook can provide students with intentional or spontaneous learning opportunities by bringing people together around shared interests, exchanging information, sharing ideas (Arteaga Sánchez *et al.*, 2014), discussing course-related materials, collaborating (Mazman and Usluel, 2010), and course management (LaRue, 2012). Besides, teachers are able to develop Facebook pages for their courses and then use them for blended teaching and learning (Irwin *et al.*, 2012). We believe that these educational values are necessary for high information quality, function quality, system quality, and social interaction environment.

The research results show that social influence plays a critical role and has a strong positive association with information quality, system quality, and function quality. The relationship between social influence, information quality, and usage intention essentially support previous findings (Hsu and Chiu, 2007; Wang and Lin, 2011). However, the non-significant relationships between system quality, function quality and usage intention are inconsistent with certain studies (Wang and Lin, 2011) but partially supported by others (Chen, 2007). The aforementioned beneficial qualities of Facebook such as enabling peer feedback, easy-to-use interaction tools, and goodness-of-fit with the social context create a Facebook that is being considered an education tool (Mason, 2006; Mazman and Usluel, 2010).

Further research is encouraged to validate these results using the IS model to examine different Facebook use patterns (Mason, 2006). Facebook use patterns included eight possible dimensions: connecting, sharing, relaxing, organizing, branding, monitoring, expressing, and learning (Aladwani, 2014). Finally, this study reveals that social influence significantly affects Facebook user decisions to continue participating in learning. Therefore, Facebook managers should focus on maintaining updated information from users and providing more friendly social influence applications to encourage users to share real-time and high-quality information in learning. Hence, Facebook developers should focus on maintaining a reliable platform with reliable, real-time, updated information from users, and should provide a friendlier user interface

of social interaction applications to encourage users to continue to share real-time and high-quality information in learning.

Similar to some previous studies, a major limitation of this study is the possibility of a common method bias due to a single questionnaire being applied to measure all constructs, and this possibility could influence the strength of the hypothesized relationships among these constructs (Lin, 2011). Therefore, we suggest that future studies employ various instruments rather than using only a single questionnaire to collect research data.

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