

Modelling predictors of blog stickiness and retention by university students

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ABSTRACT

Weblogs represent a popular tool for sharing common knowledge and promoting learning among university students. Yet, little is known about what influences university students to stick to a blog. The current study develops a framework to investigate the role of several key factors on blog stickiness and retention among university students. Data for the study was collected from a sample of university students in Malaysia (n=725) and analysed using structural equation modelling. Results of the study revealed that social influence, content quality and perceived enjoyment were the most important predictors of blog stickiness, resulting in blog retention. More specifically, it was found that the need for cognition, perceived enjoyment and social influence also play a key role in predicting blog stickiness among student. Results of this study help to provide insights to the social, cognitive and physiological components that will encourage student to read and use blogs more frequently. This understanding can assist in designing approaches to increase blog application, stickiness and retention among students and help educate better learners capable of obtaining information from electronic sources of knowledge.

Keywords: Internet use; Weblogs; Stickiness; Web retention; Technology adoption; User studies; University students.

INTRODUCTION

Blogs have become very popular in representing knowledge. Compared to the traditional web pages in which it is more difficult to post and maintain articles, weblogs have made this tasks much easier (Blood 2002a; 2002b). Thus, blogs have turned into an integral part of people's lives around the world and are considered as a popular way for internet users to obtain information and various contents. Blogs are usually maintained by an individual with regular entries of commentary, descriptions of events, or other material such as graphics or video. Most quality blogs are interactive, allowing visitors to leave comments and even message each other via widgets. It is this interactivity that distinguishes a blog from other static websites. The possibility for readers to leave a comment in an interactive format is an important part of many blogs. In that sense, blogging can be seen as a form of social networking. Indeed, bloggers do not only produce content to post on their blogs but also build social relations with their readers and other bloggers.

Blogs are popular in virtual communities, where bloggers can share personal articles, media (e.g. photographs, videos and audio), and learning experiences with others (Wang et

al. 2008). Through reflection blog users try to make sense of an experience and turn it into learning (Boud 2001). Furthermore, as a weblog provide group or individual forums on various subject areas, it can be used as a journal of professional practice (Mortensen and Walker 2002). In the same vein, weblogs can also be used as a research journal through which connections and ideas are commented and shared before formal publishing (Bartlett-Bragg 2003). The ultimate goal of weblog in education is to enhance learners' experiences and shift their learning from surface to deeper levels (Bartlett-Bragg 2003). Weblogs influence areas of society in various ways, but one of the greater impact is on business and education (Quible 2005a) by providing required materials and resources for meeting the objectives (Dron 2003; Goldman et al. 2008; Huang et al. 2008; Quible 2005b; Richardson 2003; Tougaw 2009; Williams and Jacobs 2004).

In education, the weblog has been referred to as 'ongoing learning venue' (Hardon 2005, p. 71) as it provides sharing and learning opportunities. Therefore, blogs have turned into a promising e-learning tool in higher education and are considered as the best medium for relationship management (Sweetser and Metzgar 2007). Nowadays, not only are weblogs useful for idea exchange and entertainment but they are also good sources of information. Weblogs also offer opportunities for feedback, discussions and information exchange (Xie et al. 2008). Additionally, for the education purpose, weblogs are used as learning journals. Due to their crucial role in providing information, a lot of people are interested in reading weblogs (Haddadian Moghaddam 2013).

A blog's potential value in terms of relationship maintenance as well as content sharing cannot be determined if there are no repeat readers. It is not easy to attract new visitors and in the meantime retain existing ones on the internet (Harris and Goode 2004); especially when the internet makes it so easy for users to switch from one site to another providing similar content or services (Li et al. 2006). The visitors who repeatedly visit a blog intend to stick to a blog. Stickiness behaviour which refers to "continuous use on a frequent basis" (Li et al. 2006, p. 427), is defined as the time spent on a blog. Retention is defined as "the ability of websites to draw and retain customers" (Zott et al. 2000, p. 465). As blogs provide a novel learning platform to enhance student participation (Goldman et al. 2008), and promote critical thinking (Woo and Wang 2009), it is crucial to identify the factors that determine the intention of students to stick to a blog.

The main purpose of this study is to examine the factors that influence students' intention to stick to a blog. Besides, factors that impact the quality of a blog which affect the users' intention to stick to a blog are identified. This study builds a framework to explain the key factors influencing blog stickiness among university students and its impacts of blog retention by combining Delone and McLean's Information Systems Success Model (Delone 2003) and Social Cognitive Theory (Bandura 1989). This study will help to provide insights into the social, cognitive and physiological components that will encourage students, as internet users, to read and use blogs more frequently.

LITERATURE REVIEW

Literature on weblogs has considered different aspects of use. For instance, in a study by Kaye (2005), 3,747 highly educated young weblog readers were examined to find out their motivation for using weblogs. The results showed six primary motivations: media check, convenience, information seeking, personal fulfilment, political and social surveillance, and expression and affiliation. Du and Wanger (2006) argued that weblog success mainly

depends on the content value provided to its users and/or readers. Hadadian Moghadam's (2013) study of weblogs in online translation activities, revealed that a weblog can act as a mediator between the author and his work and also facilitate literary translation by providing collaborative possibilities for translation.

Besides, Lin (2007) showed that web quality will enhance users' intention to revisit a web site. In relation to educational use, Wopereis, Sloep and Poortman (2010) examined the use of weblogs as a means to promote student-teacher reflective practices. The study revealed that students' contributions in using weblogs as reflection on critical incidents in the classroom were very useful. In the same vein of students' reflection as an important tool in enhancing teaching, Sharma (2010) supported the crucial role of weblogs in student reflection. The students commented that weblogs were useful in gaining information and the study suggested that by providing guidelines, writings on the weblogs could be consistent. Using a survey of 231 blog users, Lu and Lee (2010) found that the antecedents of blog stickiness differ between students and non-student blog users. Their study revealed that users' intentions to revisit a blog were determined by the duration of each visit, content quality and system quality, respectively.

On the usefulness of weblogs in promoting creativity, Auttawutikul, Wiwitkunkasem and Smith (2013) conducted a study to incorporate weblogs in the teaching environment of Thai students. The study found that using weblogs enhanced students' creativity and group learning. The study suggested that weblogs provide an environment in which individuals can freely show creativity and gain knowledge from peers.

As it is shown in previous studies, weblogs have played a crucial role in education, learning, and sharing of information. However, what makes the users stick to a blog is a matter of concern. Inasmuch as the information of the weblogs should be read and shared by the users to promote learning and knowledge, investigating users' intention to stick to a blog is very important. In a study by Shiao and Luo (2013), the main continuous intention of the blog users were mentioned as user involvement, satisfaction and perceived enjoyment. Blog sharing was proved to be a primarily personal endeavour facilitated by inner self-disclosure. Additionally, gender and age are the antecedents of blog differences (Lu and Lee 2012). Furthermore, experiential learning, perceived self-efficacy, and perceived usefulness can predict blog continuance learning behavioural intentions (Tang et al. 2012). According to Rufin et al. (2013), attachment, satisfaction, and trust have significant influences on commitment of the blog users and if the weblogs fulfil the users' expectations, they will be attached to the weblog.

THEORETICAL BACKGROUND AND HYPOTHESES

Two pivotal theoretical frameworks have been used in building the model of the current study, which includes Delone and McLean's Information Systems Success Model (2003), also known as D&M IS Success Model, and the Social Cognitive Theory (Bandura 1986, 1989). According to D&M IS success model, intention to use is determined by information quality, system quality, and service quality. However, blogs are a special kind of information system which provide personal content rather than organizational content, and often do not offer any services. Therefore, the D&M IS success model is adapted accordingly to fit the context of this study by eliminating the service quality dimension, as blogs do not offer any specific services. Moreover, blogs are personal content-oriented (Herring et al. 2005) and bloggers often post highly personal content on their blogs

(Huffaker and Calvert 2005). Therefore, information quality dimension is replaced with content quality to suit the context of this study. These adjustments are consistent with prior studies investigating various online systems, including web sites, blogs, and e-publishing sites, in which online attachment is fostered through content quality, context quality and system quality (Huizingh 2000; Lu and Lin 2002; Wang, Wang and Tai 2002). Therefore, we hypothesize that:

H1: Blog quality significantly influences blog stickiness.

More specifically:

H1a: Perceived content quality significantly influences blog stickiness.

H1b: Perceived context quality significantly influences blog stickiness.

H1c: Perceived system quality significantly influences blog stickiness.

Social cognitive theory explains the relationship among the personal need for cognition, social influence and perceived enjoyment. As argued by Tsai et al. (2006), the dependability to a website can be enhanced by an individual's desire-based motivation. Additionally, the need for cognition has been shown to positively influence internet users' intention to click more hyperlinks and stay longer on a website. Thus, based on social cognitive theory it is conjectured that:

H2: The need for cognition significantly influences blog stickiness.

According to Kelman (1958), individuals change their behaviour in order to achieve a favourable reaction from others. This psychological behaviour is called social influence and has been shown to significantly influence users' intention to revisit online communities. Therefore, we conjecture that when important others recommend a blog, people may spend more time browsing it to meet the expectations of their peers. To this end, we hypothesize that:

H3: Perceived social influence significantly influences blog stickiness.

Perceived enjoyment is the extent to which the activity of using the social networking sites to be enjoyable in its own right, apart from any performance consequences that may be anticipated (Carroll and Thomas 1988; Deci 1971; Malone 1981). The perceived enjoyment from browsing a blog might cause visitors to feel addicted and excited to read the articles that have been posted on the blog. Thus, we hypothesize that:

H4: Perceived enjoyment significantly influences blog stickiness.

Lastly, according to Agrawal, Arjona and Lemmens (2001), website stickiness is related to attraction, conversion and retention and is driven by website satisfaction. The more satisfied users are with the overall site experience, the more inclined they will be to revisit the website (Hong and Kim 2004). Supphellen and Nysveen (2001) demonstrated empirically that attitude toward a website is a significant determinant of site revisit. In prior studies, loyalty behaviour has usually been measured by frequency of retention and usage duration (Thorbjornsen and Supphellen 2004). Thus, we hypothesize that:

H5: Blog stickiness significantly influences retention to the blog.

Overall, the theoretical framework for this study (Figure 1) was developed based upon careful analysis of the work of Lu and Lee (2010), who modified DeLone and McLean's IS Success Model by (a) replacing information quality with content quality, (b) discarding service quality and (c) retaining system quality. This categorization is also consistent with

the study by Rayport and Sviokla (1994) which provided the rationale to categorize blog quality into content quality, system quality and context quality. In this study, blog stickiness is represented by the duration spent on a blog, in line with the definition of Li, Browne and Chau (2006).

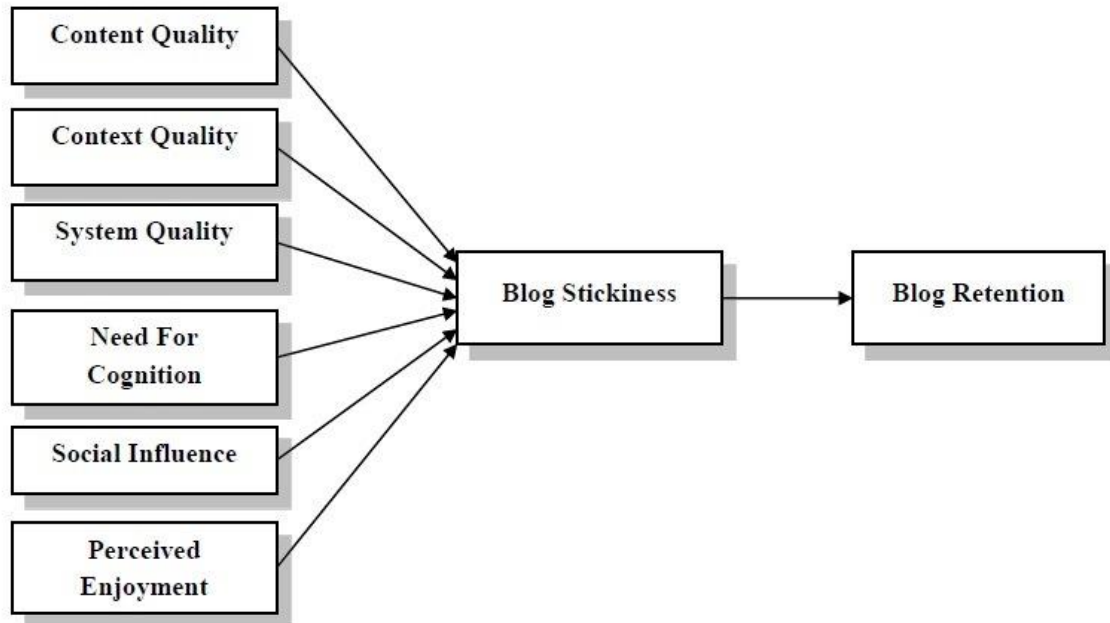


Figure 1: Theoretical Framework of this Study

METHODS

Study Sample

The population of this study comprised university students enrolled in a public university in Malaysia which was conferred the APEX status. We aimed to investigate how the students of this university use blogs. The selection criteria was having the experience of reading a blog. Stickiness was not the criteria for selection as that is measured by the time they spent on the blog. Since the list of students with blogging experience was not available, purposive non-probability sampling was applied. The questionnaire was self-administered and a total of 725 students who had prior experience in reading a blog responded. This was controlled using an inclusion criterion (i.e., control variable) which examined the past experience in using and reading blogs, as well as their frequency of using blogs.

The respondents comprised 89 per cent local and 11 per cent international students. Majority of respondents were females (71.2 per cent) and in their second year (60.8 per cent) of study. Moreover, most of the respondents were undergraduate students who lived on campus (87.6 per cent). Table 1 summarizes the demographic profile of the respondents.

Table 1: Profile of the Respondents (n=725)

		Frequency	Percentage
Gender	Male	209	28.8
	Female	516	71.2
Ethnicity	Malay	314	43.3
	Chinese	317	43.7
	Indian	69	9.5
	Others	25	3.5
Nationality	Malaysian	647	89.2
	Others	78	10.8
Year of study	1 st year	177	24.4
	2 nd year	441	60.8
	3 rd year and above	107	14.8
Program	Undergraduate	655	90.4
	Postgraduate	70	9.6
Status	Part time	104	14.3
	Full time	621	85.7
Place of residence	On campus	635	87.6
	Off campus	90	12.4

Instrument and Analysis Technique

The required data for this study was collected using a survey questionnaire administered in 2013. The instrument comprised of items adapted from established instruments from the literature. The items were measured using a 5-point Likert scale, ranging from ‘strongly disagree’ to ‘strongly agree’. Table 2 shows a summary of the source of instruments adapted for this study. The Smart PLS M2 Version 2.0 (Ringle et al. 2005) and the two-step analysis approach (measurement model and structural model) were used as suggested by Anderson and Gerbing (1988) to analyse the data. Additionally, following the suggestions of Gil-Garcia (2008), the bootstrapping method (1000 resamples) was adopted to determine the significance levels for loadings, weights, and path coefficients.

Table 2: Summary of Study Instruments

Construct	Source of Instrument	Number of Items
Stickiness	Lu & Lee (2010)	3
Perceived Enjoyment	Davis et al. (1992)	5
Need for Cognition	Lu & Lee (2010)	4
Perceived Content Quality	Lu & Lee (2010)	3
Perceived Social Influence	Lu & Lee (2010)	3
Perceives System Quality	Lu & Lee (2010)	3
Perceived Context Quality	Lu & Lee (2010)	3
Retention	Lu & Lee (2010)	3

RESULTS

Measurement Model

First, the measurement validity and reliability through convergent and discriminant validity was assessed (Ramayah, Lee and In 2011; Ramayah, Yeap and Ignatius 2013). Table 2 shows the results of the convergent validity. The loadings are all close to or more than

0.6 (Chin, Gopal and Salisbury 1997), the composite reliability values are more than 0.7 (Gholami et al. 2013), and also the average variance extracted (AVE), of all constructs are more than 0.5 (Hair et al. 2010). Thus, the measurement model has sufficient convergent validity.

Table 2: Measurement Model

Construct	Items	Loadings	AVE	CR
Stickiness	STI1	0.892	0.817	0.930
	STI2	0.928		
	STI3	0.891		
Perceived Enjoyment	ENJ1	0.842	0.726	0.930
	ENJ2	0.864		
	ENJ3	0.867		
	ENJ4	0.835		
	ENJ5	0.851		
Need for Cognition	NFC1	0.839	0.671	0.890
	NFC2	0.872		
	NFC3	0.856		
	NFC4	0.698		
Perceived Content Quality	PCQ1	0.850	0.813	0.929
	PCQ2	0.930		
	PCQ3	0.924		
Perceived Social Influence	PSI1	0.860	0.769	0.909
	PSI2	0.896		
	PSI3	0.875		
Perceives System Quality	PSQ1	0.848	0.694	0.872
	PSQ2	0.850		
	PSQ3	0.800		
Perceived Context Quality	PXQ1	0.871	0.790	0.919
	PXQ2	0.908		
	PXQ3	0.887		
Retention	RET1	0.901	0.817	0.931
	RET2	0.894		
	RET3	0.916		

Note: AVE = Average Variance Extracted; CR = Composite Reliability

The second measure of validity is the discriminant validity, which can be examined by comparing the correlations between constructs and the square root of the average variance extracted for a construct (Fornell and Larcker 1981). As shown in Table 3, the square root of the AVE is greater than the correlation with other constructs indicating adequate discriminant validity. In total, the measurement model demonstrated adequate convergent validity and discriminant validity.

Table 3: Discriminant Validity

Construct	Mean	SD	1	2	3	4	5	6	7	8
Cognition	3.582	0.717	0.819							
Content	4.009	0.678	0.295	0.902						
Context	3.860	0.697	0.338	0.601	0.889					
Stickiness	3.529	0.859	0.395	0.540	0.493	0.904				
Enjoyment	3.874	0.717	0.296	0.522	0.528	0.529	0.852			
Retention	3.449	0.933	0.392	0.508	0.476	0.749	0.543	0.904		
Social Influence	3.565	0.807	0.378	0.396	0.360	0.521	0.402	0.543	0.877	
System	3.576	0.675	0.371	0.346	0.462	0.331	0.356	0.346	0.261	0.833

Note: Diagonals (in bold) presents the square root of the Average Variance Extracted (AVE) while the off-diagonals present the correlations

Structural Model

The results of hypothesis testing are shown in Table 4. The first relationship tested was for the 5 predictors’ effect on blog stickiness and then the impact of blog stickiness on retention to the blog. Content quality ($\beta = 0.221, p < 0.01$), context quality ($\beta = 0.106, p < 0.01$), need for cognition ($\beta = 0.128, p < 0.01$), social influence ($\beta = 0.259, p < 0.01$) and perceived enjoyment ($\beta = 0.211, p < 0.01$) were positively related to blog stickiness, whereas system quality ($\beta = 0.015, p > 0.05$) was not significant. Thus, H1, H2 H4, H5 and H6 were supported. These 6 predictors explained a total of 47.3per cent of the variance in blog stickiness. Surprisingly, the most important predictor of blog stickiness was social influence followed by content quality and perceived enjoyment. The H7 which tested the impact of blog stickiness on retention was also significant ($\beta = 0.749, p < 0.01$), explaining 56.2% of the variance in retention. Thus, H7 was also supported. Both the R^2 can be considered substantial based on Cohen (1988) criteria of 0.26 which suggests that the model fit is acceptable.

Table 4: Results of Hypotheses Testing

Hypothesis	Relationship	Std. β	Std. Error	t-value	Decision
H1	Content \rightarrow Stickiness	0.221	0.037	5.949**	Supported
H2	Context \rightarrow Stickiness	0.106	0.038	2.805**	Supported
H3	System \rightarrow Stickiness	0.015	0.036	0.419	Not Supported
H4	Cognition \rightarrow Stickiness	0.128	0.033	3.876**	Supported
H5	Social Influence \rightarrow Stickiness	0.259	0.043	5.954**	Supported
H6	Enjoyment \rightarrow Stickiness	0.211	0.038	5.482**	Supported
H7	Stickiness \rightarrow Retention	0.749	0.020	37.371**	Supported

As mentioned by Chin (2010), other than looking at R^2 for the predictive power, we can also use the predictive sample reuse technique (Geisser 1975; Stone 1974) to assess predictive relevance. We used an omission distance of 7, following the suggestions of Chin (2010) who suggested that D from 5 to 10 is feasible as long as N is large. To do this we used the blindfolding procedure which gives both the cross validated communality (cv-com) and cross validated redundancy (cv-red). For the purpose of our analysis, we only assessed the cross validated redundancy values. The Q^2 cross validated redundancy for blog

stickiness was 0.382 and the Q^2 for retention was 0.455 which are above the threshold of 0 (Fornell and Cha 1994), indicating a predictive model.

DISCUSSIONS

This study aimed to examine the factors that influence student s' intention to stick to a blog and identify its impact on blog retention. In summary, the findings show that content quality, context quality, need for cognition, social influence and perceived enjoyment have a significant positive impact on blog stickiness, which ultimately significantly influences blog retention. These results extend the findings of Du and Wanger (2006) which claimed content quality to be the main success factor of a website. We found that for students, social and cognitive factors also influence the level of stickiness to a blog, along with the content quality. Social influence refers to the degree to which an individual perceives that important others believe he/she should use a new system.

Our findings provide additional support in line with the existing literature on the positive link between social influence and the behavioural intention to use a system. Moreover, the need for cognition is a personality construct defined as "the tendency for an individual to engage in and enjoy thinking" (Cacioppo and Petty 1982, p. 116). We found that for student users, the tendency to engage in blogging is a significant predictor of blog stickiness.

Results of this study are consistent with earlier studies which found that the blog features and characteristics can attract reader's attention and interest to stick to the blog (e.g., Chuan-Chuan Lin and Lu 2000; Värlander 2007). In the current study, we found the need for cognition to be a significant predictor of blog stickiness, resulting in blog retention. This echoes the findings by Tsai et al. (2006) which noted that individuals' loyalty to a website can be enhanced by their desired-based motivation.

CONCLUSIONS

Overall, the findings indicate that apart from the quality of content and context, the duration spent on a blog by students is fostered by both intrinsic and extrinsic motivations. The need for cognition and perceived enjoyment are among the intrinsic motivations for blog stickiness, as they move students to act for the fun or challenge entailed rather than "external prods, pressures, or rewards" (Ryan and Deci 2000, p. 56). Additionally, social influence is the extrinsic motivation for blog stickiness among student users, which is an effort to obtain approval or support from important others.

This study provides theoretical foundations for future research through examining the key factors which influence blog stickiness and retention among student internet users, and empirically testing a proposed model using a large sample. Future studies can incorporate other factors in this model and empirically test the framework in other contexts to examine the potential differences which are context-specific. As blogs offer a novel learning platform which promote critical thinking (Woo and Wang 2009), findings of this study can help to gain a better understanding on the key factors which foster blog stickiness and retention among student users. This understanding can assist in designing programs and approaches to increase blog application, stickiness and retention among students and help educate better learners who are capable of obtaining information from

electronic sources of knowledge sharing using critical thinking abilities. A lesson from this study to authorities dealing with ICT and educational planning is that promoting the application of weblogs among student users requires a climate which is both personally and academically supportive to ensure students' enjoyment and cognition achievement, and provide them with the necessary social support for blog application.

The findings of this study provide an addition to the D&M IS success model through highlighting the importance of cognitive and social factors for blog stickiness among students. The current study showed that other than the content and context quality, other variables, namely the need for cognition, perceived enjoyment, and social influence also play a key role in predicting the blog stickiness among student internet users. This is consistent with the notions of social cognition theory which indicates that "what people think, believe, and feel affects how they behave" (Bandura 1986, p. 25).

This study is limited by using a non-probability sampling technique. While this limits the generalizability of the study findings, the large sample size collected for this study undermines the sampling limitations and causes authors to believe that the study sample is a fair representation of the study population. However, as majority of the respondents are undergraduate students, the results of this study might not account for postgraduate student blog users. Suggestions for future research include examining the role of environmental factors on stickiness and retention to blogs. Moreover, the influence of perceived psychological well-being on blog retention can be examined in future studies.

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