

Probing university students' adoption and utilization of social networking websites in Nigeria

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This study was designed to examine the influence of socio-demographic variables, innovation characteristics, time and social systems, on university students' adoption and use of social networking websites (SNWs). Survey design was adopted. A structured questionnaire was used for data collection from 600 respondents comprising undergraduate and postgraduate students in the two public universities. Frequency distribution, factor and regression analyses were performed on the data collected. Findings revealed that socio-demographic variables had positive influence on students' adoption and use of SNWs. The three Diffusion of Innovation variables significantly contributed to the adoption and use of SNWs but innovation characteristics had the strongest influence, while time exerted the least. All the innovation characteristics had positive and significant correlation with the use of SNWs with relative advantage having the highest contribution and complexity the least. In view of these findings, university authorities need to design and develop appropriate social networking systems to serve as a cost-effective platform to deliver instructions to students.

Keywords: Social networking website; University students; Diffusion of innovation; Socio-demographics

Introduction

Human beings have always lived in communities because they are social animals that believe so much in interpersonal relationship.¹ The internet has enabled such social interactions to go beyond the traditional venue of one's community, work and home settings. The internet has in fact, created new societies based upon niche interest, such as auctions, literature and hobbies. Examples of such societies are social networking sites (SNWs) which are internet based upon a traditional social network.² The process by which communities come together, attract new members and develop a central research issue overtime in the social sciences, political movements, professional organizations, and religious denominations all provide examples of such communities.³ In recent years, social networking systems, which make use of Web 2.0 technologies, have received much attention in higher education as increasing number of younger people have made use of a public system such as Facebook and MySpace. Such systems coupled with other Web 2.0 tools help individuals to readily create or find and then share knowledge. Steven⁴ critically examined the capability of these systems to enable forms of communication controlled by the user makes the very difference to the

ubiquitously used and increasingly corporate virtual learning environments (VLES). In social networking systems, the individual user (or groups of users) can decide what they wish to work with.⁵ This means that social networking systems truly have the capability to deliver a platform for learning where the students are potentially at the center of activities.

Online social networks provide such communicative interface that is easy to use, and has been successful because of their focus on collaboration, networking, and relationships.⁶ The internet has successfully broken down global communication barrier and has simultaneously liberalized open access to information irrespective of location. Institutions of higher learning continue to count their gains in this global trend, as it has created avenue for increased collaboration among researchers from different continents. Ibegwam⁷ stated that the internet has become an important component of electronic services in academic institutions and has permeated all aspect of life and thus broken down barriers of communication and information access across the globe. This assertion also applies to social networking websites which have permeated all aspects of life and increased the rate of communication and diffusion of information globally.

The rapid growth of social networking over the years is indicative of its entry into mainstream culture and integration into the daily lives of many people. Social networking sites are experiencing a large growth and have developed a unique online presence that is continually refreshed by user generated content. Students may use the sites to interact with people they already know offline or meet new people. The explosive growth in the popularity and use of these sites has generated concerns among various researchers which calls for the need to probe issues relating to their adoption and use particularly in the context of students in an academic environment.

Many studies have been carried out on the effectiveness of networking online in a college setting.^{2,8-15} Ellison, Steinfield and Lampe¹⁰ provided insight into how college students use social networking sites in relation to creation and maintenance of social capital. Socio-demographic variables have been identified by Lenhart and Madden¹⁶ as factors that play significant roles in acceptance and use of social networking sites by students. These are variables that provide insights on the general information on individuals which include age, gender, educational status, living type, income, etc. With this, inferences could be made on the relationship that exists between the use of social networking sites and age, gender, educational status etc. Garcia¹¹ suggested that these variables are closely associated with the degree of use of social networking sites by Filipino youths. Patchin and Hinduja¹⁷ stated that adopters of new technologies tend to be younger, more educated, and have higher income than others.

With keen interest, the researchers have observed that many students of University of Benin and Ambrose Alli University, two public universities in Edo state, Nigeria engage in different internet activities, part of which is online social networking in a bid to satisfy their academic aspirations. Since the institutions in question do not have campus social networking service, this process created a desire and drive to investigate how students socialize and the benefits derived from such relationship within the online community. To carry out the study effectively, this study adopted the Diffusion of Innovation Theory by Everett Rogers¹⁸. The theory provides a general explanation for the process, called diffusion, by which new things or ideas (innovations) are disseminated or communicated through social system over time. The key variables in the theory are: innovation,

communication channels, time and social system. These variables, with the exception of communication channels, were used to analyse the adoption and use of social networking websites by the study population. However, the theory is modified by designing a research model that will further explain the usage process of social networking websites by students. Constructs adopted from Rogers's theory were innovation characteristics, time and social system. In addition, social demographic variable was included and drawn from previous empirical studies. The overall objective of this study therefore was to assess the use of social networking sites by students in two public universities in Nigeria and determine the factors associated with the use of online social networking systems.

Review of literature

The evolution of Web 2.0 technology and rapid advances in social networking websites are drastically altering the way things are done in nearly every field of human activity. The explosive growth in the popularity of these sites has rocketed from a niche activity into a phenomenon that engages youths. Ajayi¹⁷ conducted a research on use of social networking websites among students of tertiary institutions in Oyo state and concluded that male students use social networking sites more than female, a study which contrasts the finding of Watch Our Space²⁰. Chuck, Joseph and Michelle⁸ conducted a research at the University of New Hampshire (UNH) to determine whether there is correlation between heavy usage of social networking media and grades. The study found no correlation between heavy social media usage and grades. There was no significant difference in grades between those considered to be heavy users of social media and those considered to be light users. For example, 63% of heavy users received high grades compared to 65% of light users. Richard and Ryan¹³ carried out a survey on the use of social networking sites among students and discovered that the level of usage among the students is nearly universal; statistics show that 90% of the students make use of these sites. Their findings show that 86% of the students communicated and stayed in touch with friends they rarely see, 80% of students communicate and stay with friends they see on a regular basis, 72% communicated with friends they have met on camp or on vacation, 61% used the site for educational purpose while 57% of the students

used the site because their friends used these sites. Zarina¹⁴ conducted a study on the use of online social networking among Malaysian teenagers. The study was carried out among 48 students from five secondary schools. It was observed that 91.3% of students use the site to read other people's profile which made them keep in touch with friends, and 80.4% of students uploaded pictures on their site. The other activities found from the study shows that students used these sites for mailing, uploading files, watch video and downloading pictures.

Lenhart and Madden¹⁶ discovered that girls use social networking sites to reinforce pre-existing relationships while boys use the sites for flirting and making new friends. They reported that 90% of all teens use the sites to stay in touch with friends frequently, 82% use the sites rarely, 72% of all social networking teens use the sites to make plan with friends, 49% use it to make friends and 17% use the sites to flirt. Grunwald²¹ conducted a research on online social and educational networking among students which showed that 96% of the students have used social networking websites for chatting, text messaging, blogging and visiting online communities. They also discovered that social networking sites are used for various activities such as posting of messages, sharing of video, music, photos and creating content. In the study of adults and social networking websites in America, Lenhart and Madden¹⁶ found that younger online adults are much more likely than their older counterparts to use social networks, with 75% of adults age 18 – 24 using these networks, compared to 7% of adult age 65 and older. This finding shows that social networks are still a phenomenon of the young. Garcia¹¹ discovered in a study on Filipino youths that 40% of them use the site for communicating with existing friends, 32% use it for finding relief from academic stress through game applications and 2% use the site for finding friends. Ellison, Steinfield and Lampe¹⁰ concludes that nearly all Facebook users include their high school name in their profile (96%) suggests that maintaining connections to former high school classmates is a strong motivation for using Facebook. Ninety-seven percent reported that high school friends had seen their profile. A large volume of literature is available on the use of social networking websites mostly from developed countries. However, very little information is available on the use of social networking site in developing countries such as Nigeria and more precisely, how public university students use these sites.

Research model

Several theories and models have been proposed for the use and attitude towards information technology of which social networking sites are included. Among these are Technology Acceptance Model (Davis, 1989) and Diffusion of Innovation (DOI) theory (Rogers, 1995), Unified Technology Acceptance Use Theory (UTAUT),^{18,22} etc. This study was based on an adapted version of the DOI theory which provides a general explanation for the process, called diffusion, by which new things or idea (innovations) disseminates or are communicated through social systems over time. Rogers¹⁸ defines an innovation as “an idea, practice or object that is perceived as new by an individual or other unit of adoption”. Explaining the concept of “newness”, Rogers noted that as far as human behavior is concerned, it matters little whether or not an idea is objectively new as measured by the lapse of time since its first use or discovery. The perceived newness of the idea for the individual determines his or her reaction to it. He stated that “if the idea seems new to the individual, then, it is an innovation”. There are four main elements in the diffusion of innovation theory namely: the innovation, communication channels, time, and social system.

Innovation

An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. The characteristics of an innovation, as perceived by the members of a social system determine its rate of adoption. Rogers identified five attributes of innovation that influences its adoption. These are relative advantage, compatibility, complexity, trial-ability and observability.

Relative advantage is the degree to which an innovation is perceived as better than the idea it supersedes, *Complexity* refers to the degree to which an innovation is perceived as difficult to understand and used, *Compatibility* is the degree to which an innovation is perceived as being consistent with the existing value system, past experiences, and needs of potential adopters, *Trial-ability* is the degree to which an innovation may be experimented with, on a limited basis while *Observability* is the degree to which the result of an innovation is visible to others.

Communication channel

Rogers¹⁸ defined communication as the process by which participants create and share information with one another in order to reach a mutual understanding. A communication channel is the means by which

messages get from one individual to another. Rogers noted that mass media channels are more effective in creating knowledge of innovations, whereas interpersonal channels are more effective in forming and changing attitudes toward a new idea, thus influencing the decision to adopt or reject a new idea. He declared that most individuals evaluate an innovation, not on the basis of scientific research by experts, but through the subjective evaluations of peers who have adopted the innovation.

Time

The time dimension is involved in diffusion in three ways. First, time is involved in the innovation-decision process defined as “the mental process through which an individual passes from first knowledge of an innovation to forming an attitude toward the innovation, to a decision to adopt or reject a new idea. The second way time is involved in diffusion is in the relative speed with which members of a social system adopt an innovation. The rate of adoption is usually measured as the number of members of the social system that adopts the innovation in a given time period. The third way in which time is involved in diffusion is in the innovativeness of an individual or other unit of adoption. Innovativeness is defined as the degree to which an individual or other unit of adoption is relatively early in adopting new ideas than other members of a social system Rogers.¹⁸

The social system

A social system is defined as a “set of integrated units that are engaged in joint problem solving to accomplish a goal”¹⁹. The members or units of a social system may be individuals, informal groups and organization. The social system constitutes a boundary within which an innovation diffuses among individuals, organizations and informal groups. The diffusion of innovation has been described as communication oriented view of innovation based change with a focus at the individuals’ level of the process.²³ It therefore offers a powerful paradigm of conceptualizing behavior, attitude and perception as well as other social norms, communication channels, and opinions of a particular technology being used in a region.

Thus, the research model is based on the DOI and on conclusions drawn from review of empirical studies on social networking sites. The model proposes a number of relationships and interactions. First, it proposes that socio-demographic variables will affect the acceptance

and use of social networking websites. That is the extent to which individuals are similar in terms of certain attributes such as age, gender; education, lifestyle etc. will affect their usage and acceptance of social websites.²⁴ As members of online communities interact among themselves, they build deeper and stronger relationships. Often, these relationships are developed in conjunction with the degree of information exchange among members of the network. As these relationships mature, bonds between users get tighter²⁵; their trusting relationship become more concrete and are likely to perceive each other as trustworthy to share important information between them and to create common point of view²⁶. This process can influence the level of involvement of members significantly (i.e. level of acceptance and use of social networking websites) to enhance participation. Thus, we hypothesize that:

H0₁: There is no significant relationship between socio-demographic variables and use of social networking sites.

Also, the model posits that innovation characteristics (relative advantage, complexity, compatibility, trialability and observability) will influence users’ adoption and use of technology, in this case, social networking websites. Thus, we hypothesis that:

H0₂: There is no significant relationship between innovation characteristics and use of social networking websites.

In addition, the model proposes that time, a multidimensional construct, which refers to the combinational amount of time, period of adoption, duration of time etc., will affect adoption and use of social networking websites. Then, hypothesis three is formulated thus:

H0₃: There is no significant relationship between time and use of social networking websites.

Finally, the characteristics of an innovation tend to increase the likelihood of users to participate in online social communities²⁷. In line with existing social systems, this model proposes that the peculiarities of a particular social system - individuals, informal groups, and organizations all constitute a major boundary that could affect the adoption and use of social networking systems by members of a particular social community. This relationship is established in hypothesis four stated as follows:

H0₄: There is no significant relationship between social system and use of social networking websites.

Methodology

Research design, population and instrumentation

Social survey research design was adopted. The population comprised students in two purposively selected public universities in Edo state Nigeria - University of Benin, and Ambrose Alli University. The reason for the choice of these public universities is due to proximity to the researchers. This made data collection easier, faster, and also reduction in the cost of data collection. A sample of 600 students was selected comprising – 250 from University of Benin and 350 from Ambrose Alli University.

A structured questionnaire was used as the research instrument. It was sectioned into four parts - *Section A (demographic data)*: This section was designed to collect general information on respondents, *Section B (innovation characteristics)*: Questions in this section evaluated the innovation attributes on the use of social networking sites by students, *Section C (time)*: This measured the quality, duration and amount of time users spend on social networking sites, *Section D (Social system)*: Questions here collected data on the social systems involved in the use of social networking websites by students. In order to ensure the validity of the instrument, a copy was submitted to the project supervisor who worked on the content, use of words, languages, tenses, ambiguity and clarity before reproducing the final version. A test of reliability was carried out on all the components extracted. Reliability coefficient was computed using Cronbach's alpha (α) analysis on all the 44 items that measures innovation characteristics and social systems. The overall reliability scale was ($\alpha = 0.913$). The reliability scale for the individual constructs under innovation characteristics were: relative advantage of social networking website ($\alpha= 0.835$), complexity of social networking websites ($\alpha = 0.708$), compatibility of social networking website ($\alpha = 0.776$), trialability of social networking sites ($\alpha=0.741$), observability of social networking sites ($\alpha=0.801$), and social systems construct ($\alpha=0.805$) were all measured. Based on these coefficients the instrument was found reliable.

Questionnaire administration and data analyses

The questionnaire was administered in November 2011 by the researchers. Six hundred copies were administered randomly to students in the two universities. Each respondent was handed the questionnaire and required to fill it out and return it. Some students who could not fill the questionnaires

on the spot fixed an agreed time for the researchers to pick the filled copies. Out of the 600 copies administered, 26 were not returned. Hence, data was collected from 574 respondents giving 95.6% response rate. Male students accounted for the largest quota of respondents with a percentage of 51.7 while the female made up the sample with percentage of 48.3. Respondents between the ages of 25-30 years make up the highest (40.4%) of the respondents, followed by those in the 19 –24 age groups (37.1%); respondents between the ages of 18 or less (10.5%); also respondents between 31-36 age groups (8.4%) and only 3.7% were above 36 years. Respondents who were undergraduates accounted for 76.0% of the responses while Masters/PGD degree students accounted for 19.2%, and Ph.D. respondents constituted 4.9%. Respondents living in the hostel account for 16.7 % while those living off campus 83.3%.

Both descriptive and inferential statistics were used for the analyses. A step by step analysis was as follows: First, frequency distribution was carried out on all variables; next, factor analysis was performed to explore the underlying factors associated with all the items; finally, regression analysis was conducted on the four hypotheses.

Analysis

Table 1 presents the results of regression analysis on the test of hypotheses.

Table 1— Regression analysis on the relationship among the variables

Independent variables	Use of social networking websites		
	B	Beta	Sig
Gender	0.059	0.132	0.001
Age	0.104	0.110	0.001
Level of Study	0.082	0.362	0.001
Religion	0.123	0.161	0.001
Living type	0.129	0.253	0.001
Innovation Characteristics	0.012	0.986	0.001
Time	0.037	0.966	0.001
Social System	0.024	0.974	0.001

Hypothesis One

H0₁: There is no significant relationship between Socio-demographic variables and use of social networking websites.

Table 1 shows the relationship between use of social networking website and socio-demographic variables. All the socio-demographic variables have a positive and significant relationship with the use of social networking websites -gender (B=0.059,

$p= 0.001$); age ($B=0.104$, $p= 0.001$); Level of study ($B=0.082$, $p= 0.001$); Religion ($B=0.123$, $p= 0.001$); and Living type ($B=0.129$, $p= 0.001$). The null hypothesis was therefore not rejected indicating that socio-demographic variables are significant predictor of use of social networking websites.

Hypothesis Two

H₀₂: There is no significant relationship between innovation characteristics and use of social networking websites.

Table 1 shows that there is a positive and significant slope ($B=0.012$, $p= 0.001$) with use of social networking websites. The null hypothesis was therefore not rejected showing that innovation characteristic is a significant predictor of use of social networking websites.

Hypothesis Three

H₀₃: There is no significant association between time and use of social networking sites;

Table 1 shows that there is a positive and significant relationship between time ($B=0.037$, $p= 0.001$) and use of social networking websites. The null hypothesis was therefore not rejected indicating that time is a significant predictor of use of social networking websites.

Hypothesis Four

H₀₄: There is no significant relationship between social system and use of social networking websites

Table 1 shows that there is a positive and significant relationship between social system ($B=0.024$, $p= 0.001$) and use of social networking websites. The null hypothesis was thus not rejected showing that social system is a significant predictor of use of social networking websites.

Discussion

Findings revealed that socio-demographic variables influence use of social networking websites. Also, innovation characteristics had positive influence on the use of social networking website as revealed by the regression analysis that there is significant relationship between the two variables. This is inconsistent with DOI^{18,28} which holds that the characteristics of an innovation, as perceived by the members of a social system determine its rate of adoption. It also supports studies carried out by Moore and Benbasat²⁹, Agarwal and Prasad³⁰ who all agree that innovations are more readily adopted when they provide a higher *relative advantage* compared to old ideas which are *compatible* with existing value

system of the adopter, readily adopted by the adopter (*less complex*); experienced on a limited basis (*Triability*); and when the results of the innovation are more easily noticed by other potential adopters (*observability*). On the contrary, Papacharissi and Mendelson³¹ found that social media use was based on motivation than on actual behavior, and that undergraduates use Facebook out of “habit” and “time-passing” not necessary on the perceived innovative attributes of a social system technology. Therefore, it can be inferred that this finding is an effect of the uniqueness of the respondents and institutions under study based on the response rate to answer questions that pertain to the use of social networking systems and devices. Comparative analysis of the summary of values of innovation characteristics show that the construct *relative advantage* accounts for the highest, followed by *Triability* and *Compatibility*. This supports Ellison, Steinfield and Lampe¹⁰ who found that college students tend to use and adopt faster a technology that provides higher relative benefits in sharing social relationship thereby increasing their social capital status.

In addition, the study found that time significantly influenced use of social networking site. This is consistent with the findings of Hut and Speh²⁵ and Tsai and Goshal²⁶ that noted that as members of online communities interact among themselves, they build deeper and stronger relationships. Often, these relationships are developed in conjunction with the degree of information exchange among members of the network. As these relationships mature, bonds between users get tighter; their trusting relationship become more concrete and are likely to perceive each other as trustworthy to share important information with between them and to create common point of view. This process can influence the level of involvement significantly (i.e. level of acceptance and use of social networking systems) of members to enhance participation. These characteristics tend to increase the likelihood for users to participate in online communities.²⁷ However, this finding contrasts that of Chuck, Joseph and Michelle⁸ who indicated that there is no correlation between heavy social media usage and grades. There was no significant difference in grades between those considered to be heavy users of social media and those considered to be light users.

Furthermore, findings revealed that a social system which constitutes members or units of an integrated system- individuals, informal groups and organization

is positively and significantly related to use of social networking system. This finding corroborates Kappelman²³ that a social system offers a powerful paradigm for conceptualizing behavior, attitude and perception as well as other social norms, communication channels, opinions of a particular technology being used in a region. Also, in like manner, Lenhart and Madden¹⁶ discovered that girls use social networking websites to reinforce pre-existing relationship while boys use the sites for flirting and making new friends. Garcia¹¹ discovered in a study on Filipino youths that 40% of them use social networking sites for communicating with existing friends, 32% use it for finding relief from academic stress through game applications and 2% use the site for finding friends. Ellison, Steinfield and Lampe¹⁰ concluded from their study that nearly all Facebook users include their high school name in their profile (96%) suggesting that maintaining connections to former high school classmates is a strong motivation for using Facebook.

Implications

The findings from this study suggest the following implications for educationists and policy makers to develop appropriate online activity and policies that will provide the required framework for students' understanding of use of social networking websites along with privacy rights. First, level of study was found to have more significant influence on socio-demographic variable which implies that its direct involvement in the use of social networking websites should be emphasized and information professionals should be given the responsibility to appropriate the right mechanisms that will promote the use of social networking websites among students - most especially younger adults³². Since undergraduates account for the highest use of social networking websites among level of study, education practitioners, government, policy makers, and school administrators can make concerted efforts to foster the targeted relationships and interpersonal interactions among students which are necessary for creating and maintaining a positive attitude towards the productive use of social networking websites. This can increase information sharing culture in organizations and institutions of learning. Second, living type of respondents (that is whether students live in school hostel or off campus) was also found to have high significant influence on social-demographic variables. Thus, the environment users live in exerted some

influence on their use of SNWs. Consequently, the government and other education stakeholders could provide orientation programmes that would educate users about the effect of their immediate social environment on use of SNWs. Finally, gender was also found to have significant influence on socio-demographic variable. This implies that effective social networking systems and devices that will facilitate gender friendliness and productivity can be encouraged and promoted by corporate organizations, and education managers.

In addition, since relative advantage exerted the greatest influence on innovation characteristics in relation to the use of social networking websites, this provides opportunities for institutions and corporate organizations to fully adopt this technology as a means of reducing communication and advertising cost; and also reaching a wider audience through social networking systems. On trialability and compatibility of social networking sites, organizations that produce or market social networking devices can concentrate efforts on designing devices that may be experimented with, on a limited basis before adoption; and also on devices that are compatible with the existing values and social system. These will definitely yield higher returns and better patronage from users of social networking sites as identified by this study. Also, there is significant relationship between time and use of social networking websites, which implies that deeper bond, is established through longer usage. Consequently, this finding can aid school administrators, guardians and users in providing appropriate mechanisms and insights on security and privacy issues. Institutions of learning can take advantage of this to foster learning relations among students. Business and other corporate organizations can use this phenomenon to strengthen customer relationship in their respective organizations. Also, institutions and organizations can use this process to also promote teacher-student, employer-employee, and boss-subordinate ties. Furthermore, the practical implication of the findings on social systems is that the government and education managers can use social networking websites to establish a community of citizens across various geographical regions through effective e-government ideals and proper e-channels for education. Since social system is found to be significantly related to the use of social networking websites, the Nigerian government can take advantage of this technology to

further promote national integration and unity in the country despite the multi-faceted and diverse cultures, and ethnic interests in the country. The government and education managers can use this technology to promote tourism; and make our cultural products sellable to other countries.

Conclusion

This study examined the factors that played significant role in the use and adoption of social networking systems. Empirical evidence shows that socio-demographic variable remains the most significant of all the variables considered in users' adoption of social networking systems while time has the least significant influence. The findings could help school administrators, government, students and corporate organization in operation and making strategic plan for maximum utilization of online social networking resources. In view of these findings it is recommended that:

1. Authorities in tertiary institutions should design appropriate ICT education programs for students to enable them use maximally the information resources available in the social networking websites. This will aid students in search for articles and other materials for knowledge development, and also provide techniques on how to use effectively the available social networking systems and facilities to achieve the desired result. This ICT education programmes can be integrated into the curriculum.
2. Educators and institutions should promote the use of social networking websites by providing facilities that will encourage students to use the websites. This can be achieved by the support of the government by making available the financial resources to acquire those facilities. The availability of such facilities will provide users in Nigeria institutions the right social platform to engage and participate actively in online social interactions and relationship. This can also increase information sharing culture in organizations and institutions.
3. Tertiary institutions and education policy makers should experiment using chat rooms, instant messaging, blogs, wikis etc. for the submission of assignments, term papers, review sessions and collaborative projects to see how this could have productive impact on students. The reason for this is to provide other learning opportunities to students. This can also provide cost effective

means to students and institutions, as an alternative to the huge investment in e-learning process through websites management activities etc. In addition students can learn from their professional colleagues in other parts of the world thereby achieving a diversified approach to learning.

Future studies could expand the research model adopted in this study and a larger sample drawn from other universities so as to factor in institutional and organizational culture differences and provide a more robust test of the hypotheses. Second, future studies could consider the security implications of using social networking websites like privacy intrusions, data theft, virus intrusions, rumor peddling, identity theft, online predators, and other security-related issues posing challenges to online social network use.

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