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Users' Intention to Share Knowledge Using Wiki in Virtual Learning Community

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ABSTRACT

Many educational organizations are using Wikis to enhance virtual learning to encourage knowledge sharing inside between students and instructors. Wiki is an ideal tool for the online knowledge sharing at educational organizations which help to achieve more collaborative work environment between students and instructors. However, educational organizations sometimes fail of building successful virtual community and users abound Wikis for several reasons. This research explored the use of Wikis to share knowledge in virtual learning community. A proposed conceptual framework was developed examining the UTAUT model in new context by using it to test the behavior intention to share knowledge through the Wiki technology in virtual community. A survey to postgraduate students shows that social influence, performance, and effort expectancy have impact on students' attitude to share knowledge through Wikis.

KEYWORDS

Knowledge Sharing, Technology Acceptance, UTAUT, Wiki

INTRODUCTION

Knowledge management is an essential part of developing and consolidating the core competencies of organizations (Fatt and Khin, 2010). Many educational institutions and organizations tried to encourage sharing knowledge by implementing virtual learning communities (VLC) (Chen et al., 2009). To build virtual communities, many computer mediated communication technologies were used such as emails, instant messengers, discussion forms, chat rooms, video and audio streaming and recently weblogs and Wikis (Cheung and Lee, 2007; Limongelli, 2015). As a social technology, Wiki enables users to work together to build knowledge in collaborative way (Scardamalia and Bereuter, 2003). Wiki is fast, economical and appropriate tool for environments where knowledge is decentralized, located with multiple owners and for ad-hoc knowledge building (Jiang and Chen, 2014; Limongelli, 2015).

While the promise to use the Wiki to establish a virtual learning community is great, the successful implementation of virtual communities cannot be accomplished by simply grouping people together, offering them a communication system and invite them to engage in a collaborative way (Jiang and Chen, 2014). To achieve the most effective use of the Wiki in enhancing education, there is a need to investigate users' intention towards using Wikis to construct successful virtual learning and share their knowledge. Reviewing the literature shows few researches which investigated this issue in developing countries. Accordingly, this research seeks to answer this research question: What are the factors that affect users' intention to share knowledge using Wiki in virtual learning community?

The paper structure starts by presenting the theoretical background for understanding the literature review about e-democracy and social networks. This is followed by proposing a suggested e-democracy model. The methodology used in research is discussed in the following section and followed by the results and discussion.

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THEORETICAL BACKGROUND

Knowledge Sharing

Knowledge is mix of data, information, experience, values, ideas, intuition, expert insights and intelligence skills (Davenport and Prusak, 1998). There are two types of knowledge, explicit and tacit knowledge (Hamel, 1991). Tacit knowledge is what resides in people's mind e.g. experience. Explicit knowledge exists in the form of physical material hence it can be easily captured and transmitted (Stevens et al., 2010). External Knowledge can be coded and stored in a database to be easily accessed by anyone in organization (Civi, 2000). Knowledge sharing occurs between certain group members using a form of communication in order to acquire knowledge from each other. Davenport and Prusak (1998) stated that the success of knowledge sharing depends on the successful transfer, absorb and use of the knowledge, which in turn creates positive changes in the behavior of the knowledge receiver.

According to O'Dell & Grayson (1998) knowledge management is a strategy used to help people to improve their potential and upgrade the performance of the organization by sharing knowledge among them, thus the right people can get the right knowledge at the right time (Charnkit, 2010). Gold et al. (2001) stated that KM has main four processes starts by the capture of embedded knowledge (O'Dell and Grayson, 1998). Then moving to the second step which is conversion process by moving from tacit knowledge to external knowledge by informal interaction and discussions which is called knowledge transfer (Tan, 2011). Knowledge transfer requires group cooperation to share knowledge and achieve common benefits (Syed-Ikhsan and Rowland, 2004). The third step is disseminating knowledge by making knowledge available, which is considered a very important to achieve the required benefits of this knowledge in the right time (Syed-Ikhsan and Rowland, 2004). Finally, knowledge utilization which refers to events and activities related to the application of knowledge (Tan, 2011).

Virtual Learning Community Using Wiki

The recent knowledge management researches emphasized the importance of knowledge management interactive technologies; i.e. virtual communities including the individual human side into the equation of knowledge management (Ardichvili et al., 2003). The technical features of interactive technologies are used to unleash the enthusiasm of knowledge sharing in organization (Paroutis and Al Saleh, 2009). Online virtual communities bring people from different backgrounds together to facilitate the knowledge creation through the collaboration and collective knowledge sharing among the community members (Marsico, Sterbini, and Temperini, 2015).

One type of virtual communities is virtual learning communities (VLC) which consist of teachers and students with a common goal to share knowledge through the internet. The goal of visual learning communities is to encourage participants to explore or share knowledge through the internet in order to enhance learning performance (Chen et al., 2009). Wenger et al. (2002) stated that the online learning communities are not just database of resources, but they are groups of individuals who incorporate in online cyberspace to learn and build relationship and this process creates mutual commitment.

Choosing the appropriate software application is very important in facilitating the communication and a sharing among communities (Sauer et al., 2005), thus the selected knowledge sharing system should be flexible to support the various forms of tacit or explicit knowledge (Watson and Harper, 2008). Wiki is one of Web 2.0 most popular applications. Wiki is a collection of web pages, interlinked together and stores information; it is like a hypertext system involves a database of pages, and each page can be easily edited by other users (Schwartz et al., 2004). In Wiki users can not only read the Wiki content but they can also add to it, modify or reorganize its content such as text, videos and images (Augar et al., 2004).

In Wiki, users can share many types of media (images, videos, etc.), which can be used to capture the incidental, informal and tacit knowledge and convert it to explicit knowledge (Jackson, 2010). Moreover, users can describe and structure the information using metadata and immediately

update and share it (Jackson, 2010). Wiki is open editing; which means that anyone can edit the Wiki content; moreover, users can trace all the changes and control the different versions of content (Wang and Wei, 2011).

The Use of Wiki to Share Knowledge in VLC

The characteristics of Wiki make it the most appropriate tool for knowledge building and sharing. The knowledge business value chain could be achieved using Wikis and virtual community (Charnkit, 2010). Knowledge value chain is sequence of tasks or processes through it the knowledge workers create the organization's competitive advantage value, these processes are acquisition, storage, dissemination and application (Civi, 2000) which could be achieved through using Wikis as the following:

- Knowledge acquisition: Virtual learning community is considered one of the expert knowledge networks; hence, we will use Wiki to create virtual community to acquire the knowledge.
- Knowledge storage: Most of Wiki applications use databases to store the knowledge.
- Knowledge dissemination: Using the Wiki as an intranet portal we can disseminate the knowledge between the members of the community.
- Knowledge application: We can use the developed knowledge in decision-making or in enterprise applications.

However, user acceptance to share knowledge through Wikis is an important issue (Dillon and Morris,1996) since users might not use Wikis, it is important to understand students' to accept using Wiki to share their tacit knowledge among each other would provide better delivery of courses (Limongelli, 2015). Over the years, several models and theories were developed to explain the acceptance and adoption of technological innovation. Koçak-Usluel and Mazman (2009) stated that to study the users' intentions could be done using different models and theories. This includes the diffusion of innovation theory, technology acceptance model (TAM) and unified theory of acceptance and usage theory (UTAUT).

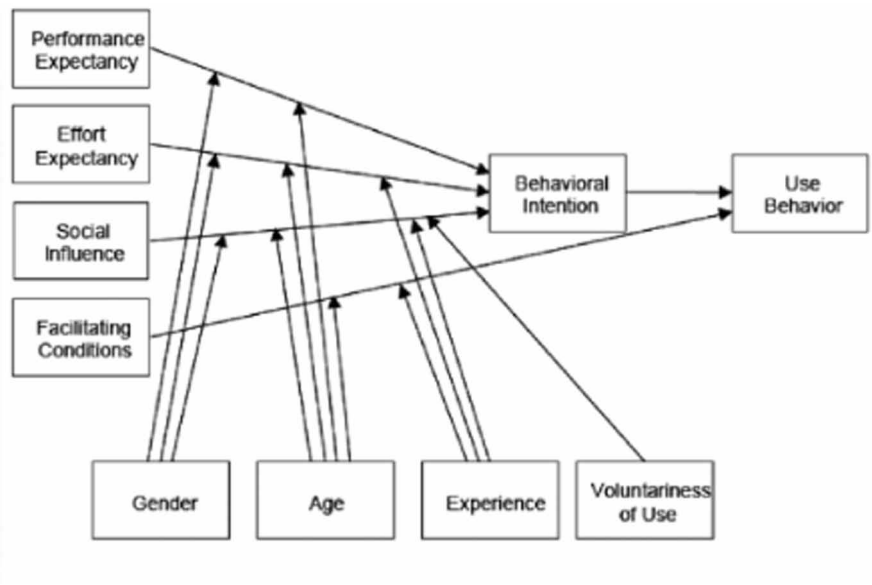
The main criticism to TAM is that it did not consider the external factors of the organization which affect the adoption (Wells et at., 2010) and focused mainly on the attitude of the decision maker (fuchs, 2010). While UTAUT included the social influence and facilitating condition constructs which represent the organization external factors (Brown et al., 2010). UTAUT allows the researchers to understand the factors that affect the adoption of new technology in the context of social impact, innovation and psychology (Venkatesh et al., 2003).

Venkatesh et al. (2003) developed a unified model based on TAM principle and called it the unified theory of acceptance and use of technology (UTAUT). UTAUT integrated the important factors of 8 models and theories including innovation diffusion theory (IDT), theory of planned behavior (TPB), reason action theory (TRA), technology acceptance model I and II (TAM), motivational model (MM), model of PC utilization (MPCU) and social cognitive theory (SCT) to develop a unified model (Venkatesh et al., 2003). The developed model has four main constructs, performance expectancy, effort expectancy, social influence and facilitating conditions, these constructs influence the behavioral intention and/or the use behavior as shown in Figure 1.

Behavioral intention is capture how people are willing to perform a certain behavior (Chen et al., 2009). The intention is considered the most important factor for the individual actual behavior, which means that persons are most probably sharing their knowledge when they have the enough intension to do that (Zamiri, 2012).

The entire UTAUT model or part of it was validated and replicated in many studies since it was developed in 2003, these studied covered different variety of technologies such as internet banking, e-learning, ERP systems, education and social medial applications. Table 1 presents some of studies applied UTAUT in various technologies.

Figure 1. The UTAUT model (Venkatesh et al., 2003)



PROPOSED CONCEPTUAL MODEL

This research employed the UTAUT to assess the users' intention to use Wiki to share knowledge in virtual learning communities. Since UTAUT made a balance between the technological, external and social dimensions of using information systems, however there is a need to cover the knowledge-sharing dimension by including the factors that motivate the knowledge contributors to share their tacit knowledge online as it will affect the behavior intention to use the Wiki.

The proposed model also extended the UTAUT model by adding other three knowledge-sharing factors that influence the user behavior to share knowledge online. The developed model posits that performance expectancy, effort expectancy, social influence, reciprocity and attitude to share knowledge together affect the behavior intention to use the Wiki for knowledge sharing in virtual community. The proposed conceptual model is shown in Figure 2.

Performance Expectancy

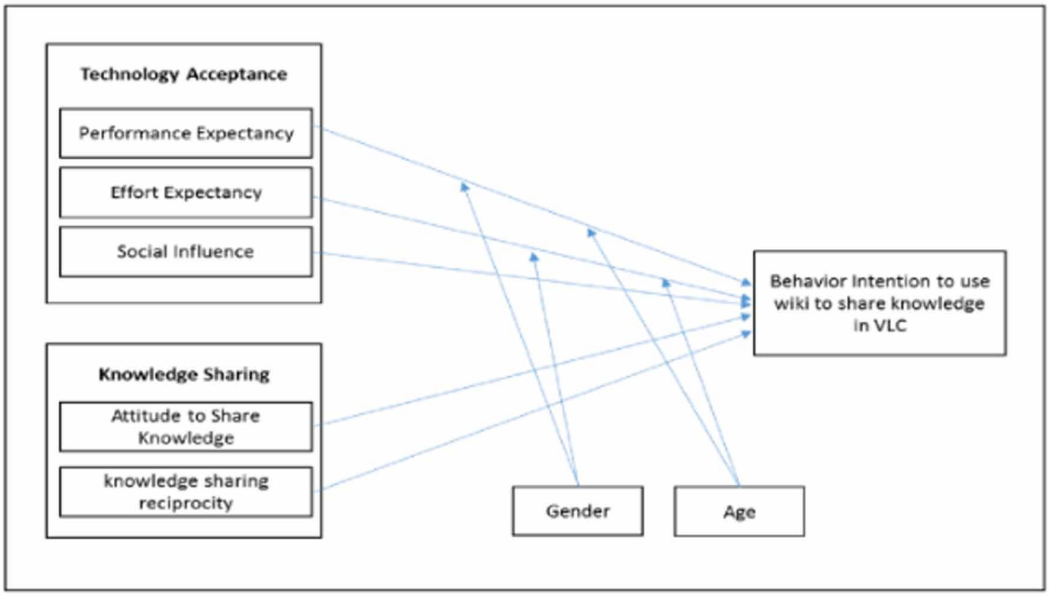
Performance expectancy is defined as 'the degree to which an individual believes that using the system will help him or her to attain gains in job performance' (Venkatesh et al., 2000). The performance expectancy construct is considered to be one of the strongest factors for the behavior intention (Dillon and Morris, 1996). Thomas et al. (2013) used UTAUT to study and explain how factors such as performance and effort expectancy affect the intention to adopt mobile learning in Guyana. Accordingly, performance expectancy would encourage students to use Wikis to increase their performance by sharing knowledge among each other. Based on this we assume the following:

H1: Performance expectancy (PE) significantly affects the intention to use Wiki to share knowledge in virtual learning community

Table 1. Previous researches used UTAUT

Research	Purpose
Oye et al. (2011)	The study uses the UTAUT model to understand the behavioral intention of the high education teachers to adopt and accept ICT.
Wu et al. (2012)	The study investigates the acceptance and use of electronic ticket system created using g RFID by using the UTAUT model.
Tan (2013)	The purpose of this study is to investigate the core factors that affect the attitude of the university students to use computerized placement test.
Tai (2013)	This study investigates the intention of stock investors to use mobile stock trading using a modified UTAUT with perception of risk.
Shu and Chuang (2011)	This study adapts the UTAUT by adding the user involvement factor to investigate the behavior of Wiki users
Yu (2012)	This study investigates the factors impact people to use mobile banking by employing the UTAUT.
Pardamean and Susanto (2012)	The study Investigates the adoption of the blog technology using the UTAUT model.

Figure 2. Proposed conceptual model



Effort Expectancy

Effort expectancy is defined as the degree of ease associated with the use of the system (Kang, 2011). Venkatesh et al. (2003) used this construct to capture the other models' concepts such as ease of use. Effort expectancy was found to be strong predictor wither it is used in mandatory or voluntary contexts, however its significance decreases with the time it is being used (Lahtinen, 2012; Jiang and Chen, 2014). Based on this we assume the following:

H2: Effort expectancy (EE) significantly affects the intention to use Wiki to share knowledge in virtual learning community

Social Influence

Social influence is "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, p. 451). Social influence was found to be not significant in the voluntary context and significant in the mandatory context especially at the beginning of the adoption process. Social influence captures similar constructs in the other models, subjective norm, social factors and image. Based on this we assume the following:

H3: Social influence (SI) significantly affects the intention to use Wiki to share knowledge in virtual learning community

Attitude to Share Knowledge

Ajzen and Fishbein (1980) stated that the attitude has been found an influence on the behavioral intention. In a study conducted by Kolekofski and Heminger (2003) to examine the factors which influence the behavioral intention to share knowledge, they found that the attitude positively affect the user's intention to share their knowledge (Chen et al., 2009). Wixom and Todd (2005) also found that the attitude to use information system is strongly associated with the intention to use information system. Based on this we assume the following:

H4: Students' attitude toward knowledge sharing significantly affects the intention to use Wiki to share knowledge in virtual learning community

Knowledge Sharing Reciprocity

In knowledge sharing, reciprocity refers to the improvement in relationship among knowledge contributors and the future help that they expect from others by their contributions (Kankanhalli et al., 2005). Reciprocity could be considered as a motivation for individuals to contribute to a system as they expect to receive help quickly when they need it (Connolly and Thorn, 1990; Rheingold, 2000). Based on this we assume the following:

H5: Reciprocity significantly affects the intention to use Wiki to share knowledge in virtual learning community

Moderators' Hypotheses

H6: The influence of performance expectancy on behavioral intention will be moderated by gender.
H7: The influence of performance expectancy on behavioral intention will be moderated by age.
H8: The influence of effort expectancy on behavioral intention will be moderated by gender.
H9: The influence of effort expectancy on behavioral intention will be moderated by age.

RESEARCH METHODOLOGY

The design of this research is based on quantitative approach which helps to answer the research question: What are the factors that affect users' intention to share knowledge using Wiki in virtual learning community? To give students an overview upon the usage of Wiki for discussion and sharing resources in virtual community before they fill the survey, a demo using Wiki was created as a virtual

community for the participants and uploaded it to one of the free Wiki spaces available online. The demo shows the activities performed and how the navigator is designed to simulate the main majors in a postgraduate program.

Pilot Study

Before the main study was carried out, a pilot study was performed to find out any problem in the measurements and the data collection procedure. Pilot testing is used to test reliability and validity of the measurement instruments, after which the researcher can start the data collection with the sampled population (Bhattacherjee, 2012). For this purpose, the questionnaires were distributed to a sample of 30 students whom have similar characteristics with the target population characteristics. The respondents filled the questionnaire and their feedback was taken into consideration to improve the quality of measurements.

Data Collection

Questionnaires were used as they are precise, quick and give participants' time to form their answers, and could be used to reach a wider spectrum of participants (Ghauri, and Gronhaug, 2005). The questionnaires were developed by the researcher based on the literature review. The population for this study includes postgraduate students who are studying in Egyptian universities. In Egypt, 20 public universities and 23 private universities. Two Egyptian universities were selected (one public and one private universities) to distribute a self-administered questionnaire to collect data from postgraduate students. The students were postgraduate students come from diverse business sectors and seek to have a postgraduate degree. Out of 130 questionnaires collected, 124 were valid and used in the data analysis. The collected data is then analyzed using SPSS.

Questionnaires Design

The questionnaires were divided into two parts; the first part collects demographic data such as age, gender and previous experience in using Wikis. The second part contains 24 questions assess the variables in the proposed model. Likert (1932) scale was used to measure ordinal data using five points scale (Bhattacherjee, 2012). In this study 5-point Likert scale is used where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree (Table 2).

ANALYSIS AND RESULTS

General Demographic Analysis

Descriptive analysis run to summarize the results of the demographic data of the sample. The results are summarized in Table 3. The majority of respondents are between the ages of 30 to 40 (57.3%) and there is almost equal gender distribution in the sample. Although many subjects in the sample used the Wikis on daily, weekly and monthly base, only 25.8% of subjects used it in discussion.

Internal Consistency Reliability

The pilot testing is performed to find out any problem in the measurements and the data collection procedure. The result shows that the questionnaire had a good degree of reliability for all factors (Table 4).

Correlation Analysis

Correlation analysis is used to evaluate the relationship between each independent or predictor variable (performance expectancy, effort expectancy, social influence, attitude to share knowledge, and reciprocity) with the dependent variable (behavior intention) (Table 5).

Table 2. Instrument development

Variable	Measure	Factors
Performance Expectancy (PE)	Measures the level that individual believes that by using the Wiki will gain learning benefits.	Expected General Usefulness Expected Learning quality The Speed of task accomplishment Learning productivity Getting better grades
Effort Expectancy (EE)	Measures the level that individual believes that Wiki is easy to use.	System clear and understood Effort needed to use the Wiki Ease of use Time needed to operate Wiki
Social Influence (SI)	Measures the level of importance that individual believes that other opinions, instructors and university support using the Wiki.	Influence of other students Influence of the instructor University support
Attitude to Share knowledge (AK)	Measures the degree that individual believes that sharing knowledge is important.	General Usefulness of sharing the knowledge in different learning activities
Reciprocity (RE)	Measures the degree that individual believes that others will give him feedback as a result of sharing his knowledge	Expected to get feedback for future inquiry By sharing knowledge, get knowledge when needed
Behavior Intention (BI)	Measures the individual intention to use the Wiki in future	intention to use the Wiki in future
Gender	records the gender type male or female	
Age	records the age category	

Table 3. Demographic analysis

Variable	Category	Percentage
Age	19-29	32.3%
	30-40	57.3%
	41-51	10.5%
Gender	Male	51.6%
	Female	48.4%
Previous experience of using Wikis	Daily	11.6%
	Weekly	41.9%
	Monthly	14%
	Rarely	14%
	Never	8.5%

The result shows that there is a strong positive significant association between the performance expectancy and behavior intention ($r = .681$, $P < .01$). Moderate positive significant association between effort expectancy and behavior intention ($r = .583$, $P < .01$). Moderate positive significant association between social influence and behavior intention ($r = .451$, $P < .01$). Moderate positive significant association between attitude to share knowledge and behavior intention ($r = .594$, $P < .01$). Moderate positive significant association between reciprocity and behavior intention ($r = .485$, $P < .01$).

Table 4. Reliability result

Factor	Cronbach's Alpha	No. of Items
Performance Expectancy	0.763	6
Effort Expectancy	0.758	4
Social influence	0.773	4
Attitude to share knowledge	0.716	3
Reciprocity	0.813	4
Behavior Intention	0.771	3

Table 5. Correlation matrix

	PE	EE	SI	AK	RE	BI
PE	1	.562	.338	.576	.431	.681
EE	.562	1	.357	.516	.454	.583
SI	.338	.357	1	.460	.349	.451
AK	.576	.516	.460	1	.398	.594
RE	.431	.454	.349	.398	1	.485
BI	.681	.583	.451	.594	.485	1

Multicollinearity Analysis

Since multicollinearity might exist in regression analysis and negatively affects the predictive ability, computing the variance inflation factor (VIF) of each variable might help to detect multicollinearity (Myers, 1986). If the VIF of an explanatory variable exceeds 10, the variable is considered to be highly collinear and it can be treated as a candidate for exclusion from the regression model (Kleinbaum et al., 1988). As their VIF values are not close to 5 (1.650 to 3.268) (Coaks et al., 2008), so it is possible to proceed with the regression tests without the need for excluding any variables.

Multiple Regression Analysis

To assess the accuracy and relative importance of the independent variables on the behavior intention, multiple regression analysis is used (Table 7).

The result shows that the linear combination of all the independent variables is significantly related to behavior intention, $F(5, 118) = 33.526$, $p<0.05$. The correlation coefficient is 0.760, which indicates that approximately 58.7% of the variance in behavior intention can be accounted by the linear combination of the independent variables.

The below hypotheses in Table 8 provide answer to the research question. The model proposed 5 factors to influence the user behavior intention to use the Wiki and the results that only 4 factors have significant effect on the behavior intention and the reciprocity effect was insignificant relative to the other 4 factors.

DISCUSSION

To understand the factors that contribute in users' intention to use Wiki to share knowledge, a proposed model was developed to assess the users' intention to use new technology. The proposed model is

Table 6. Multicollinearity test results

Variable	VIF
Provision	1.935
Collection	1.692
Interface	2.246
Multimedia	1.243
Emoticons	1.878
Privacy	2.916
Security	3.268
Influence Groups	1.650

Table 7. Regression model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766	.587	.569	1.25927

Table 8. Research hypotheses status

Hypothesis #	Hypothesis path	Status
H1	PE→BI	Accepted
H2	EE→BI	Accepted
H3	SI→BI	Accepted
H4	AK→BI	Accepted
H5	RE→BI	Rejected
H6	Age→(PE→BI)	Rejected
H7	Gender→(PE→BI)	Accepted
H8	Age→(EE→BI)	Rejected
H9	Gender →(EE→BI)	Rejected

based on UTAUT model and extended to include other factors, which motivate users to share their knowledge in online virtual community. A survey was conducted to 124 postgraduate students who are studying in Egypt to examine the proposed model. Findings show performance expectancy has positive significant influence on behavior intention. Performance expectancy shows the level that students find that Wiki is useful and relative in their learning activities. Performance expectancy was the strongest predictor to behavior intention to use the Wiki as the students found the Wiki useful and relevant for discussion and collaboration in different topics out of class, which is a major concern for postgraduate students, coming from diverse business sectors and have limited time for discussion in or after the class. This result is consistent with the result of previous researches (Venkatesh et al., 2003; Pardamean and Susanto, 2012).

Using Wiki in learning would help students to gain more knowledge through discussion between each other. This would help student to overcome the time and space limitations and students will freely

response to other inquires and give feedback. This could be confirmed through the significance of the effort expectancy where students found that using Wiki help them to gain more knowledge without the need to making much effort. Accordingly, effort expectancy shows the level of ease of use. The result showed that the lower effort in using the Wiki contributed in the student intention to use it. This result is consistent with previous research of Venkatesh et al. (2003) where he confirmed that effort expectancy is a strong predictor wither it is used in mandatory or voluntary contexts.

Social influence also did show significant influence on behavior intention. Social influence impact shows how the others' opinions are important to use the new system especially between students who are studying in Egypt. This indicates that the opinion of friends, instructors or group members is considered a powerful force to students' intention to use the Wiki. It was expected that the power of this predictor will be weak during the pre-implementation phase, as the researchers found that social influence is considered an important factor only when directives exists such as government regulations (Venkatesh and Davis, 2000).

From the knowledge sharing prospective, it was found that the attitude to share knowledge significantly influence the behavior intention to use Wiki in virtual learning community. This was expected as the main purpose of Wiki is to share knowledge to improve learning activities thus if the user does not have a positive attitude toward sharing the knowledge in general, they will not accept to use the Wiki. This result is consistent with previous researches (Chen et al., 2009; Bock et al., 2005; Wixom and Todd, 2005). To avoid the failure of the implementation of this new knowledge sharing system, it is important to promote the culture of sharing among the Egyptian students.

Reciprocity on the other hand did not show a significant influence on behavior intention inside the mode. This indicates that the knowledge contributors will share their knowledge with no expectation to receive future help when they need it. This result was against the expectation and inconsistent with other researches (Kankanhalli et al., 2005; Bock et al., 2005). Justification is that the Egyptian culture played a role in this factor as the Egyptian tries to help each other without waiting for a return.

The effect of gender as a moderator factor was found to be not significant on the interaction of the effort expectancy, my justification for this is that both genders have similar capabilities to use the social networks such as Wikipedia and Facebook and found ease of use factor the same for them. The interaction of age on performance expectancy was not significance on both performance expectancy and effort expectancy, which is inconsistent with Venkatesh et al. (2003).

Research Contribution, Limitation and Future Research

This research contributes by extending the UTAUT model to new context by testing the behavior intention to sharing knowledge through in virtual community. Accordingly, the research succeeded in contributing a conceptual model for assessing the intention to use Wiki to share knowledge in virtual learning community. On the practical side, the research highlighted the use of the Wiki as an effective tool for knowledge sharing in virtual communities which lead to having better virtual learning community.

Research limitation includes the limited number of the sample size compared to the population size. Moreover, the research is limited to postgraduate students only who are studying in Egyptian universities where culture factors might differ from one country to another. It is recommended to extend the study to different universities in different countries. Also, it is recommended to combine qualitative approach to the quantitative approach to get more in depth understanding of other factors that contribute in the student's intention to use the Wiki.

CONCLUSION

This research explored the use of Wikis to share knowledge in virtual learning community. The research examined the factors that contribute in the user intention to use or discard of the Wiki to share knowledge in academic environment. A survey was conducted to 124 postgraduate students

who are studying in Egyptian universities. The result confirmed that the three factors used from the UTAUT (performance expectancy, effort expectancy and social influence) have significant influence on the behavior intention to use Wiki to share knowledge in academic context, which is consistent with findings in the literature review. The result also confirmed that the attitude to share knowledge is an important factor to use the Wiki in the context of knowledge sharing.

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