CONCEPTUAL MODEL OF COLLABORATIVE E-LEARNING ACCEPTANCE

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ABSTRAK

Abstract: Collaborative e-learning (CE) is very prominent nowadays. CE combination can be a tough development as it requires large technological resources. CE can get reasonable advantages and growth performances, but its high disappointment degree is concerning. This study investigated the student populace's acceptance of the CE by wiki technology through the Unified Theory of Acceptance and Use of Technology (UTAUT) model in order to examine the effects of major factors on intention to use the wiki to learn. From the review of previous papers, the study has identified the extra factors that should be added in proposed conceptual model namely performance expectancy, effort expectancy, social influence, e-collaboration and intention to use for collaborative eLearning.

KATA KUNCI: *Collaborative e-learning (CE); model The Unified Theory of Acceptance and Use of Technology (UTAUT)*

1. INTRODUCTION

As of late, e-learning has turned out to be extremely renowned. The incorporation of data innovation in educational programs makes considerably more viable learning condition when contrasted with customary learning. The learning environment also implemented the use of up-to-date systems and educational technologies. The development of technologies in education is growing rapidly and it would give powerful impacts towards teaching, learning, and education itself (Cheng *et al.*, 2014). One of the most powerful tools for professional learning is CE (Summers *et al.*, 1995). It is where understudies are required to work in gatherings of at least two to look for comprehension, arrangements or manufacture an item. It does not necessarily involve teacher's presentation or explication, but it focuses more on student's exploration of the content; hence, CE activities vary widely (Mohammadi, 2015). CE has many benefits and advantages and it is applied in many contexts such as universities, organizations, and industry. Undoubtedly, CE is mainly utilized by the higher education field. Several studies have been conducted in this context, for example, a study on activity of group assignment in virtual setting (Doyle *et al.*, 2016), study on the tools and platform used for performing CE, (P. Lin *et al.*, 2013),(Esterhuyse & Scholtz, 2016), (Khechine *et al.*, 2014), (Dascalu *et al.*, 2015) attitudes in interaction that occur in CE platform (P. Lin *et al.*, 2013), student engagement satisfaction (Al-rahimi *et al.*, 2013), (Ahmad *et al.*, n.d.), (Burke, 2011), experience and perception of learner using CE (Popovici & Mironov, 2015), (Teo & Zhou, 2014), (DeWitt *et al.*, 2014), (Hsu, 2012), (Punnoose, 2012), comparison of impact using CE (Ismail *et al.*, 2010), and evaluating performance using CE (Khalil & Ebner, 2013), (Shu & Chuang, 2011), (Gielen & Wever, 2015) and (Fidalgo-blanco *et al.*, 2015).

This paper reports a work-in-progress research project that is examining how CE is perceived and used by both students and academics in the Malaysian higher education context. The mixed reactions, there is no doubt that collaborative eLearning such as wiki offers myriad of benefits, particularly in enhancing communication, collaboration and sharing among the users. There are a great potential and enthusiasm in utilizing these tools, yet very few studies have been conducted in the academic area regarding students‟ intention to use collaborative eLearning, social media or Web 2.0 technologies during the learning and/or teaching process and little is known about the user experience, intentions, perceptions and acceptance of these technologies by students and academics (V. Balakrishnan, 2017), (A, 2015), (See *et al.*, 2013), (Aifan, 2015) but much of this work has focused on quantitative research with general of technologies with an emphasis mainly on student's perception and acceptance and not specific which technologies are able and suite with CE. (See *et al.*, 2013) developed the conceptual version which proposed draws from the community of exercise (cop) because of the building blocks of the digital learning network for better educational institutions. A significant outcome could be the development of a design framework for enforcing social media as supporting equipment for pupil engagement and teaching and getting to know of informatics applications in better schooling institutions in Malaysia. Confined examination required been keeping tabs toward those lecturers‟ disposition, support or refusal over coordinating Online networking under their publications. But, the recognized adequacy of the rigging and pupil outcomes to the considering must a chance to be investigated profoundly. (Shittu *et al.*, 2011).

Investigating students' state of mind furthermore expectation to utilize social programming on higher establishment about taking in in Malaysia. The discoveries of the considered over uncovered that every last one of an autonomous variable of the examine variable (perceived usefulness, subjective norm, and recognized simplicity of use) predict the disposition about scholars at social product selection. Similarly, disposition might have been discovered will be the stronger predictor about students‟ purposeful to utilize community software, also resolute suitability might have been found should make the stronger predictor for students‟ state of mind should SNS. Exploring employee's recognition on the require should coordinate the utilization from claiming social product to guidelines conveyance purposes may be a basic investigation on conduct, looking at for demographic data, for example, learner age, gender, and other variables majority of the data such as learner academic execution (CGP) and the impact for hour for utilization of social product on learner general execution. Students no longer use the web to obtain information but instead create information and share it with others. They are seen to use web 2.0 applications such as wikis, social networking, social bookmarking and blogs on a regular basis (Abraham & Junglas, 2011).

The review showed that majority of past research focused on investigating the factors affecting the intention to use of collaborative Learning (Popovici & Mironov, 2015), (Ngampornchai & Adams, 2016), (Sadaf *et al.*, 2012), (Abrami, 2010). The best of our knowledge this is the first study on intention to use Wiki in CE. Yet, there is few study conducted on CE phenomenon. Due to this, CE especially Wiki needs to be deeply reviewed. It is important to discover factors affecting students‟ intention to use latest CE technology, especially Wiki. In this manner, Unified Theory of Acceptance and Use of Technology (UTAUT) is utilized to dissect the variables influencing understudies' goal to take an interest in CE using Wiki apparatus is chosen for this investigation. This study is the first in Malaysia since the previous study almost done in Africa (Cheung & Vogel, 2013a), Taiwan (Buchanan *et al.*, 2013), German (Dascalu *et al.*, 2015) , Turkish (Punnoose, 2012), China (Lu & Lee, 2011).

2. LITERATURE REVIEW AND HYPOTHESIS

It is most significant to measure the components that effect understudies' conduct and goal to take part in CE. In fact, factors that influence students‟ behavior should be made into acceptance technology theory. This is approved and supported by several studies (Cheng *et al.*, 2014). Basically, previous researchers claimed that there are six models that are suitable to be used to investigate e-learning acceptance namely Technology Acceptance Model (TAM) (Newbury, 2016), Theory of Planned Behavior (Zhu *et al.*, 2015), Social Cognitive Theory (Cheung & Vogel, 2013a), Diffusion of Innovation Theory (Li *et al.*, 2014), Decomposed Theory of Planned Behavior (Obadi *et al.*, 2010) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Stantchev *et al.*, 2015). Moreover, previous research mainly focused on the overall CE concept such as comparing student's behavior (Popovici & Mironov, 2015), positive elements of use (Ngampornchai & Adams, 2016), the study on experience differences (Sadaf *et al.*, 2012) and continuance intention for CE (Abrami, 2010). Moreover, new factors have been added or stretched out to the UTAUT demonstrate by each examination keeping in mind the end goal to realize client acknowledgment of CE. Many studies have proposed collaborative learning systems that use platforms such as blogs (Alzahrani & Newbury, 2016) and social networking sites (Osman & Chung, 2011) and (Laal *et al.*, 2012). To achieve efficient collaborative learning, it is important to consider learners‟ specific needs. A previous study found that an online collaborative platform needs to provide users not only with technical assistance but also interact with other users (Vivian *et al.*, 2013).

There are many aspects of technology acceptance in e-learning that have been studied by various researchers. For example technology acceptance model and e-learning (Punnoose, 2012), the perceptions, acceptance, usage, and access to social media (See *et al.*, 2013), determined the student readiness for using social media for learning (Tajudeen *et al.*, 2015), to examine behavior intention to use Web 2.0 technologies for learning (Usoro, Abel; Echeng, 2015), Factors Influencing the Use of Social Media in Adult Learning Experience (Teo, 2011), students‟ attitudes towards using social media to support their learning (Toh, 2013), (Li *et al.*, 2014), online empirical collaborative learning (Li *et al.*, 2014), and the intention to adopt mobile learning (Obadi *et al.*, 2010). Currently, there are several ongoing types of research done in University Technology Malaysia for collaborative learning. (Mathews *et al.*, 2017) used construct self-efficacy, technical support, administrative support, infrastructure, system interactivity, budgeting and accountability and organizational culture, PSU, PEOU, IU, and Actual social software usage in learning to establish a model for adopting social networked learning in higher institutions of learning in developing countries of Africa (Cheung & Vogel, 2013b), Taiwan (Buchanan *et al.*, 2013), German (Dascalu *et al.*, 2015), Turkish (Punnoose, 2012), China (Lu & Lee, 2011). It's showed that Malaysia also need to carry out research to determine the influence of factors towards the adoption of new learning media in education and it is important and needed to explore the intention to use Wikis in CE in Malaysia. Collaborative e-learning tools are also known as platforms which are the interacting tools should assist students and lecturer in formal and informal ways [54]. Recently, these tools have emerged as a significant part of today's educational system, including learning management systems (LMS), for example, Facebook (Gan, 2017), Wiki (Cao *et al.*, 2014), Blackboard (Shu & Chuang, 2011), Blog (Newbury, 2016), and Google Docs (Nair *et al.*, 2015).

Previously, research in Wiki studied the effectiveness of Wiki as a teaching tool has been studied at many levels such as schools, colleges and universities (Aofan & Qianqian, 2016). From an education perspective, Blog technology has the potential to improve student engagement and provide an environment for collaboration and knowledge construction (Maillet *et al.*, 2015). Blackboard also strengthened students‟ engagement and interactivity (Shu & Chuang, 2011). The effectiveness of Facebook communication and discussion tools

had studied by (Lwoga & Komba, 2015). Another researcher studied and explore Google Docs as a learning tool (Lwoga & Komba, 2015). It can conclude that, based the previous review, mostly the studied are almost to investigate the effectiveness, engagement students, environment and the tools of CE. Aside from offering a more straightforward communication between users, these tools also provide an easy means to share knowledge among long distance users (C.-P. Lin & Anol, 2008). Based the previous review, Wiki is less in a study which to determine factors influence intention to use mainly in Malaysia. Based on this literature review, the researcher will fill these gap which to examine the influence of other constructs on students‟ intention such as gender, age, and level of education, and students‟ academic performance to be included which it is can improve the prediction capacity of the model (Mckeown & Anderson, 2016). This study should also address the effective method of using the social software to support student learning. In the meantime, this study has contributed in determining the factors that influence student's attitude to social software use (Ibert *et al.*, 2016). Therefore, the researcher will develop a conceptual model for examining students' intentions to use Wiki as a Collaborative eLearning learning purposes since the tools of Wiki are very little studied in previous research (Neo *et al.*, 2012). This study also using some attributes that were based on UTAUT model and several extended factors. This study will discover the factors that influence the intention to use Wiki in CE.

3. RESEARCH METHODOLOGY

The methodology undertaken in this study is literature review analysis and connecting concepts in a conceptual model. First, major requirements of collaborative eLearning, essential factors that should be present in a situation in which collaborative eLearning earnings place, have been recognized by regular analysis of literature using content analysis approach. Next, nominated requirements of collaborative eLearning have been debated in relation to the community broadcasting features and abilities. UTAUT model frequency that had been used by previous research to investigate the factors of user's intention. These studies are focusing on a domain of collaborative eLearning.

To identify major requirements of intention to use collaborative eLearning, the prospective set of articles was drawn up by searching popular online databases such as ProQuest, Ebsco-Host, Emerald, Web of Science, Elsevier, Scopus, Science Direct, and Google Scholar/books. The dialect constraint (English) might have been connected to the chose articles. The combination of the following terms used for searching the aforementioned databases "Collaborative eLearning/ Social networking environments/Internet-based virtual worlds/Social networks/ Web 2.0/ UTAUT model/ Intention to use / Wiki". To ensure the quality of papers, cases having less academic rigor (not published in peer-reviewed scholarly publications) or having the inadequate discussion about the topic were discarded from the sample. Initially, exact statements of authors which explicitly or implicitly stated some requirements for intention to use collaborative learning were collected and summarized in a table.

Table 1: Variables in by several UTAUT model variations used in this study

Construct/Occurences	(Magsamen-conrad, Upadhyaya, Youngnyo, & Dowd, 2015)	(C. Lin, Ph, Anol, & Ph, 2008)	(City, Publishing, City, Publishing, & City, n.d.)	(Wai, Chu, Wai, & Lam, 2015)	(P. Lin, Lu, & Liu, 2013)	(Buchanan, Sainter, & Saunders, 2013)	(Chiu & Wang, 2008)	(Giannakos, 2014)	(Khechine, Pascot, & Bytha, 2014)	(Muhammad Abubakar & Hartini Ahmad Director, 2013)	Total
Social Influence	1	1	1	1	1		1	1	1	1	9
Performance Expectancy	1		1	1	1		1	1	1	1	8
Effort Expectancy	1	1	1	1	1		1		1	1	8
Behavioral Intention	1		1	1	1			1	1	1	7
Facilitating Conditions	1	1				1	1			1	5
Training Academic						1			1		2
Online Social Support		1									1
ICT or Programming								1			1
Technology awareness										1	1

In light of Table 1 above, there are many variables that can be reached out from UTAUT models so as to examine client acknowledgment to innovation in view of particular sorts of study. The researcher has examined ten UTAUT display explore articles to perceive the fundamental patterns and factors utilized as a part of these investigates, particularly on the e-learning theme. The table showed that certain factors have been frequently used to investigate the factor for intentions to use which domain in e-learning using UTAUT model. The results from the table showed that the construct frequently used to examine the influence factor of intention to use by UTAUT model. For instance, in the article Utilizing UTAUT should anticipate multigenerational tablet selection polishes (Ilias & Giannakos, 2016), have utilized the UTAUT model concerning illustration a hypothetical essential to increase. Furthermore, enhancement surviving to utilize tablet. Learning Online Social Support (East *et al.*, 2008). Relying on the basic UTAUT model, they examine the extent to which perceived critical mass, social influence, online support expectancy, relationship commitment, network it usage intention, effort expectancy, network it usage, facilitating conditions and online social support toward an investigation of network information technology (East *et al.*, 2008).

Although most consumers are still reading e-books on a computer (Mhouti & Nasseh, 2016), found that more and more people use mobile phones to read e-books which the main purpose of that studied. By using performance expectancy, effort expectancy, social influence, attitude toward using technology, demographics, and behavioral intention was to explore "consumers „attitudes and the intentions of using cross-media e-books." In order to respond to the wave of digital publishing, publishers should upgrade their technological capacity and then publish cross-media e-books. (Alzahrani & Newbury, 2016) focused on the level of correspondence the middle of students‟ recognized Taking in Also educating support styles, which together straightforwardly moderate the purposeful and utilization about e-taking in frameworks. It might have been enriching the UTAUT model by coordinating cognitive distinctive contrasts on orchestrating those impacts about demographic moderators. Comprehension Web-based taking in continuation intention, (Hsu, 2012) shown that performance expectancy, effort expectancy, computer self- efficacy, attainment value, utility value and intrinsic value, also innate esteem were huge predictors of individuals‟ intentions will keep utilizing Web-based learning, same time uneasiness required a critical negative impact. The intention to use a webinar was directly influenced by performance expectancy, effort expectancy and facilitating conditions (Laal *et al.*, 2012) which studied the factors that explain the acceptance of a webinar system in a blended learning course by students using the same model like others which is UTAUT model. In context online social support, (Raman *et al.*, 2014) claimed that relationship commitment and perceived critical mass are potent determinants that can ultimately enhance online social support through online support expectancy and other mediators. Social influence plays a more significant role than other constructs in that study as it affects online social support directly and indirectly through the intention-behavior path.

In addition, very little existing research has adopted collaborative eLearning techniques. Furthermore, understanding factors that could influence student learning in the collaborative eLearning could help students applying this new way of learning in their process learning (Yueh *et al.*, 2015). However, very few studies have developed models to empirically investigate factors on student learning in a collaborative eLearning environment (Y. Guo, 2015). With the intention of addressing these gaps, this study first introduced the design of a collaborative eLearning and then developed a research model to systematically examine the influential factors (such as performance expectancy, effort expectancy, social influence and e-collaboration) on students‟ intention to use in this new learning environment using Wiki (DeWitt *et al.*, 2014). The researcher‟s selected only five elements for this study namely

performance expectancy, effort expectancy, social influence, e-collaboration and intention to use. The reason that this element was chosen is that based on Table 1, these were the main variables used by previous researchers in their UTAUT studied in intention to use which domain in e-learning. In this study, the researchers maintain the same UTAUT model as adopted from Chaka & Govender, (2017). As justified by Venkatesh et al. (2012), facilitating conditions in the original UTAUT in the environment that observes agree make an act easy to do, including the provision of computer support, Venkatesh et al. (2012) guaranteed that when both performance expectancy constructs also effort expectancy constructs would present, facilitating conditions gets to be no noteworthy over foreseeing expectation.Therefore, the facilitating conditions variables have been dropped in this study.

Next, researchers modified this model and added one more element in this proposed model which is e-collaboration. The most important element to be examined in the study of intention to use Wiki is e-collaboration. It should be noted that the UTAUT model does not include e-collaboration elements. However, in this study, the researchers include e-collaboration elements to examine the intention to use Wiki for CE.

E-collaboration camwood makes characterized likewise coordinated effort "around people locked in done a basic undertaking utilizing electronic innovations. Collaboration is the key to a successful online learning method. It can develop a strong sense of community and collaboration among learners. Collaboration is linked to learners‟ greater satisfaction with their academic program and reduced feelings of isolation (Fidalgo-blanco *et al.*, 2015). Electronic collaboration (e-collaboration) can be clarified as the collaboration between people to play out a particular task utilizing most recent innovations. There are numerous innovations utilized as a part of e-collaboration, for example, email, groupware, talk instruments, Blog, Wiki, Facebook and others (Review *et al.*, 2017).

Recently, several tools have emerged as a major part of today's educational system, including learning management systems (LMS) such as Blackboard (Shu & Chuang, 2011), Blog (Newbury, 2016), Facebook (Gan, 2017), Wiki (Cao *et al.*, 2014), and Google Docs (Nair *et al.*, 2015). Besides offering a more direct correspondence between clients, these apparatuses additionally gives a simple intends to share information between long separation clients (Khalil & Ebner, 2013). Generally, the previous studied more focused on effectiveness, engagement and the tools of CE. However, the influences factors intention to use CE especially Wiki are less in previously studied. In this study, Wiki is selected as the tool of collaboration. The comparison has been made between Wiki and other methods that support CE, and it is found that Wiki has the best features to support CE. Wiki can be used to upload and share documents, create content online in HTML, conduct online discussions, grade discussions/participation, initialize online chat, perform student peer review, answer online quizzes/surveys, online grade book, submit student's documents, perform self-assessment of submission for student workgroups, student journals, and embedded glossary. Therefore, based on these features, Wiki will be used as the tool for this study. Since this study will investigate the intention to use Wiki as a collaborative e-learning tool, therefore the elements of e-collaboration will be included in this proposed model. This data will be used to detect particular activities and elements that lead to students‟ intention towards using Wiki in CE.

4. ANALYSIS AND RESULT

Figure 1 shows the last proposed demonstrate for understudies' aim in CE utilizing Wikis. To turn out with another hypothetical system, analysts need to reevaluate which factors are legitimate and invalid (Lv *et al.*, 2010). Figure 1 presents the general applied model and next subsections will clarify the variables incorporated into the proposed investigate display.

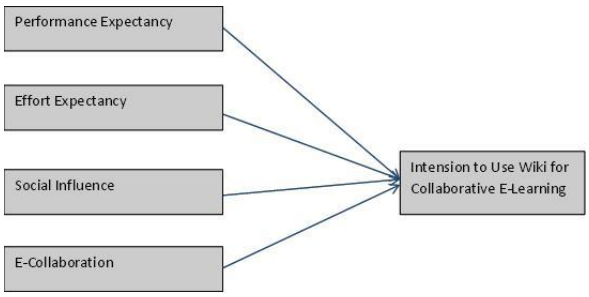

Fig. 1. Proposed Model for Students‟ Intention to Use Wikis in CE Adopted from Chaka & Govender, (2017)

1) Performance Expectancy (PE)

Performance expectancy (PE) can be defined as "the degree to which a person believes that using the system will assist in improving his/her job performance" (Israel *et al.*, 2016). PE is comparable to perceived usefulness in TAM and relative advantage in Diffusion of Innovations model (Israel *et al.*, 2016). In UTAUT, PE is posited as a direct determinant for behavioral intention (BI). A study found that PE is more significant compared to effort expectancy (EE) (Israel *et al.*, 2016) and the same outcome was found in other similar studies (Zhu *et al.*, 2015), (Ibrahim *et al.*, 2011) and (Dumpit & Fernandez, 2017). In this investigation, PE will be utilized to think about understudies' point of view on the advantages of utilizing Wikis for CE. A few types of research have accentuated the pretended by PE on BI in utilizing online learning instruments (Ebrahim, 2011), (Vivian *et al.*, 2013), (Visuvalingam, 2006) and (Mhouti & Nasseh, 2016). In this investigation, in concurrence with the UTAUT display, if understudies saw CE conceptual model as valuable, this will increase the value of their learning procedure and they will probably utilize the model.

2) Effort Expectancy (EE)

Effort expectancy (EE) can be explained as "the degree of ease linked with the use of the system" (Israel *et al.*, 2016) and is similar to ease of use in TAM (Cheng *et al.*, 2014). In UTAUT, EE is posited as a direct determinant for BI. In the literature larger part of research done on comparative theme found that EE influences BI (Padilla-Melndez *et al.*, 2008), (Dumpit & Fernandez, 2017), (R. Guo *et al.*, 2015), (Mhouti & Nasseh, 2016), (Buchanan *et al.*, 2013) and (Cheung & Vogel, 2013a). For this examination, EE is incorporated into the request to think about understudies' observation on the usability of the framework and to gauge their aim in utilizing Wikis. Understudies will be additionally eager to utilize Wikis in the event that they found that this tool is relatively easy to use.

3) Social Influence (SI)

In similar terms, social influence (SI) is the social pressure originating from the external environment of a person that may influence his/her opinions and behaviors (Israel *et al.*, 2016). SI has a direct effect on BI because people may be affected by opinions of people surrounding him/her, and become involved in things that they may be reluctant to take part in. (Israel *et al.*,

2016) opined that this happens in compulsory situations and rarely happens involuntary situations. In view of UTAUT rules, this exploration will think about the immediate impact of SI on BI. From the CE perspective, understudies' choice to utilize and acknowledge such advances is normally because of associate impact (partners/different understudies) and teacher impact (bosses/educators) (Mhouti & Nasseh, 2016), (Buchanan *et al.*, 2013), (Yen-Ting Lin1 *et al.*, 2013) and (Chaka & Govender, 2017).

4) E-Collaboration

Even though the initial UTAUT model does not include the e-collaboration factor, it is confirmed that this factor is important to improve the intention to use and actual usage of information technology (IT). (Raes *et al.*, 2012) claimed that collaboration perspectives are urgent on the grounds that they prompt positive recognition towards IT framework, accordingly enhancing CE utilization rate. Different examinations demonstrated that client collaboration highlights can be ascribed with help of, acknowledgment of, and fulfillment with IT systems (Oye *et al.*, 2011).

5) Intention to Use

Positive intention to use was found to be important in the actual use of technology (Liaw & Huang, 2013). It is proven that UTAUT model can be used to determine users‟ intention to use, especially in the field of technology (Israel *et al.*, 2016) and (R. Guo *et al.*, 2015). Intention to use implies a client's force or wants to utilize advanced data assets for his/her learning procedure. This factor assumes an urgent part in anticipating future use of an innovation (Ioannou *et al.*, 2015). Numerous investigations support the fundamental connection between intentions to use (Israel *et al.*, 2016).

5. CONCLUSION

CE is very useful to be applied in the learning process because it is beneficial for students, lecturers and also for organizations (C.-P. Lin & Anol, 2008). The main advantages from CE can be concluded in three categories which save time (Stockleben *et al.*, 2016), knowledge sharing and interaction (Elgort, n.d.) and builds the skills (Ibert *et al.*, 2016). This paper has proposed a conceptual model for CE intention to use Wiki. Previous studies have proven the lack of studies done in influences factors intentions to use CE especially using Wiki and its more focused on the effectiveness of CE(Greenhow *et al.*, 2009), engagement and interactivity with related tools (B. Balakrishnan, 2014), (Khor, 2015), (Lv *et al.*, 2010)], In general, this study modified the original UTAUT in order to measure students‟ intention to use Wiki for CE. This study adopts the core constructs used in UTAUT. Specifically, it validated the relationship between performance expectancy, effort expectancy, social influence, e-collaboration and intention to use. However, future researchers need to deeply review the evaluation criteria related to the topics studied for CE.

REFERENCES

A. (2015). Saudi Students' Attitudes Toward Using Social Media To Support Learning. *Uma Ética Para Quantos?*, *XXXIII*(2), 81–87.

Abraham, C., & Junglas, I. (2011). Journal of Strategic Information Systems From cacophony to harmony : A case study about the IS implementation process as an opportunity for organizational transformation at Sentara Healthcare. *Journal of Strategic Information Systems*, *20*(2), 177–197.

Abrami, P. C. (2010). On the nature of support in computer-supported collaborative learning using gStudy - January 17, 2009. *Computers in Human Behavior*, *26*(5), 835–839.

Ahmad, M. N., Colomb, R. M., Johnston, L., Probst, H. A., Gamon, J., Wolfe, K., & Newcomer, N. (n.d.). Ontology-Based Applications for Enterprise Systems and Knowledge Management.

Aifan, H. A. (2015). Saudi Students' Attitudes Toward Using Social Media To Support Learning. *King Abdu-Aziz University, Jeddah*, 278.

Al-rahimi, W. M., Othman, M. S., & Musa, M. A. (2013). Using TAM Model To Measure The Use Of Social Media For Collaborative Learning, *5*(2), 90–95.

Alzahrani, N., & Newbury, P. (2016). Self-Summarized Video in Adaptive Collaborative E-Learning Environment Pilot Study. *SAI Computing Conference*.

Aofan, L., & Qianqian, C. (2016). Investigating the Determinants of Mobile Learning Acceptance in Higher Education Based on UTAUT.

Balakrishnan, B. (2014). Online Computer Supported Collaborative Learning (CSCL) for Engineering Students : A Case Study in Malaysia, 1–11.

Balakrishnan, V. (2017). Key determinants for intention to use social media for learning in higher education institutions. *Universal Access in the Information Society*, *16*(2), 289–301.

Buchanan, T., Sainter, P., & Saunders, G. (2013). Factors affecting faculty use of learning technologies: Implications for models of technology adoption. *Journal of Computing in Higher Education*, *25*(1), 1–11.

Burke, A. (2011). Group Work : How to Use Groups Effectively, *11*(2), 87–95.

Cao, Y., Bi, X., & Wang, L. (2014). A study on user adoption of cloud storage service in china: A revised unified theory of acceptance and use of technology model. *Proceedings - 2013 International Conference on Information Science and Cloud Computing Companion, ISCC-C 2013*, (2012), 287–293.

Chaka, J. G., & Govender, I. (2017). Students' perceptions and readiness towards mobile learning in colleges of education: a Nigerian perspective. *South African Journal of Education*, *37*(1), 1–12.

Cheng, B., Wang, M., Mørch, A. I., Chen, N.-S., Kinshuk, & Spector, J. M. (2014). Research on e-learning in the workplace 2000–2012: A bibliometric analysis of the literature. *Educational Research Review*, *11*, 56–72.

Cheung, R., & Vogel, D. (2013a). Computers & Education Predicting user acceptance of collaborative technologies : An extension of the technology acceptance model for e-learning. *Computers & Education*, *63*, 160–175.

Cheung, R., & Vogel, D. (2013b). Predicting user acceptance of collaborative technologies: An extension of the technology acceptance model for e-learning. *Computers and Education*, *63*(February 2014), 160–175.

Dascalu, M., Bodea, C., Moldoveanu, A., Mohora, A., Lytras, M., Ordoñez, P., & Pablos, D. (2015). Computers in Human Behavior A recommender agent based on learning styles for better virtual collaborative learning experiences, *45*, 2014–2016.

DeWitt, D., Alias, N., & Siraj, S. (2014). Wikis for Collaborative Learning: A Case Study of Knowledge Management and Satisfaction among Teacher Trainees in Malaysia. *Procedia - Social and Behavioral Sciences*, *141*, 894–898.

Doyle, C., Sammon, D., Neville, K., Doyle, C., Sammon, D., & Neville, K. (2016). A design science research (DSR) case study : building an evaluation framework for social media enabled collaborative learning environments (SMECLEs). *Journal of Decision Systems*, *25*(February 2017), 125–144.

Dumpit, D. Z., & Fernandez, C. J. (2017). Analysis of the use of social media in Higher Education Institutions (HEIs) using the Technology Acceptance Model. *International Journal of Educational Technology in Higher Education*.

East, E. W., Kirby, J. G., & Liu, L. Y. (2008). Verification and validation of a project collaboration tool, *17*, 201–214.

Ebrahim, G. A. (2011). An Intelligent Collaborative E-Learning Strategy.

Elgort, I. (n.d.). eCollaboration in Learning , Teaching and Research.

Esterhuyse, M., & Scholtz, B. (2016). The Intention to Use e-Learning in Corporations 68 . The Intention to Use e-Learning in Corporations.

Fidalgo-blanco, Á., Sein-echaluce, M. L., García-peñalvo, F. J., & Ángel, M. (2015). Computers in Human Behavior Using Learning Analytics to improve teamwork assessment, *47*, 149–156.

Gan, C. (2017). Understanding WeChat users' liking behavior: An empirical study in China. *Computers in Human Behavior*, *68*, 30–39.

Gielen, M., & Wever, B. De. (2015). Computers & Education Scripting the role of assessor and assessee in peer assessment in a wiki environment : Impact on peer feedback quality and product improvement. *Computers & Education*, *88*, 370–386.

Greenhow, C., Robelia, B., Hughes, J. E., Greenhow, C., Robelia, B., & Hughes, J. E. (2009). Educational Researcher.

Guo, R., Li, L., Shen, Y., & Zheng, G. (2015). Which Collaboration Technologies Best Support Student Teamwork ? An Empirical Investigation. *Twenty-First Americas Conference on Information Systems, Puerto Rico*, (Eisner 2010), 1–7.

Guo, Y. (2015). Moderating effects of gender in the acceptance of mobile SNS based on UTAUT model. *International Journal of Smart Home*, *9*(1), 203–216.

Hsu, H. (2012). The Acceptance of Moodle : An Empirical Study Based on UTAUT, *3*(December), 44–46.

Ibert, I., Isotani, S., & Pedro, A. (2016). Computers in Human Behavior Does peer assessment in on-line learning environments work ? A systematic review of the literature. *Computers in Human Behavior*, *64*, 94–107.

Ibrahim, R., Khalil, K., & Jaafar, A. (2011). Towards educational games acceptance model (EGAM): a revised unified theory of acceptance and use of technology (UTAUT). *International Journal of Research and Reviews in Computer Science*, *2*(3), 839–847. Retrieved from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Towards+Educational+Games+Acceptance+Model+(+EGAM+):+A+Revised+Unified+Theory+of+Acceptance+and+Use+of+Technology+(+UTAUT+)#0

Ilias, P. M., & Giannakos, P. M. (2016). An integrative adoption model of video-based learning. *The International Journal of Information and Learning Technology*, *33*(4), 219–235.

Ioannou, A., Brown, S. W., & Artino, A. R. (2015). Wikis and forums for collaborative problem-based activity: A systematic comparison of learners' interactions. *Internet and Higher Education*, *24*, 35–45.

Ismail, S., Ling, D., Yii, H., & Batch, Y. (2010). Collaborating Wiki with University Database for Focused Learning Support, 40–54.

Israel, M., Wherfel, Q. M., Shehab, S., Ramos, E. A., Reese, G. C., Israel, M., … Ramos, E. A. (2016). Assessing collaborative computing : development of the Collaborative-Computing Observation Instrument (C-COI) Assessing collaborative computing : development of the. *Computer Science Education*, *3408*(January 2017), 1–26.

Khalil, H., & Ebner, M. (2013). Using electronic Communication tools in Online Group Activities to Develop Collaborative Learning skills, *5*(4), 1–10.

Khechine, H., Pascot, D., & Bytha, A. (2014). Interdisciplinary Journal of E-Learning and Learning Objects UTAUT Model for Blended Learning: The Role of Gender and Age in the Intention to Use Webinars. *Interdisciplinary Journal of E-Learning and Learning Objects*, *10*, 33–52. Retrieved from http://www.ijello.org/Volume10/IJELLOv10p033-052Khechine0876.pdf

Khor, E. T. (2015). Virtual collaborative learning using wiki for adult ODL learners: The case of Wawasan Open University. *Asian Assocation of Open University Journals*, *10*(2), 1–12.

Laal, M., Laal, M., & Khattami, Z. (2012). 21st century learning ; learning in collaboration. *Procedia - Social and Behavioral Sciences*, *47*, 1696–1701.

Li, Q., Abel, M. H., & Barthès, J. P. A. (2014). Modeling and exploiting collaborative traces in web-based collaborative working environment. *Computers in Human Behavior*, *30*, 396–408.

Liaw, S., & Huang, H. (2013). Computers & Education Perceived satisfaction , perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers & Education*, *60*(1), 14–24.

Lin, C.-P., & Anol, B. (2008). Learning online social support: an investigation of network information technology based on UTAUT. *Cyberpsychology and Behavior*, *11*(3), 268–272.

Lin, P., Lu, H., & Liu, S. (2013). Towards an Education Behavioral Intention Model for E-Learning Systems : an Extension of Utaut, *47*(3), 1120–1127.

Lu, H.-P., & Lee, M.-R. (2011). Experience differences and continuance intention of blog sharing. *Behaviour & Information Technology*, *31*(11), 1–15.

Lv, J., Zhou, W., & Wang, X. (2010). Design and evaluation of a wiki-based collaborative learning environment for colleges computers compulsory education. *ICCSE 2010 - 5th International Conference on Computer Science and Education, Final Program and Book of Abstracts*, 695–699.

Lwoga, E. T., & Komba, M. (2015). Antecedents of continued usage intentions of web-based learning management system in Tanzania. *Education + Training*, *57*(7), 738–756.

Maillet, É., Mathieu, L., & Sicotte, C. (2015). Modeling factors explaining the acceptance, actual use and satisfaction of nurses using an Electronic Patient Record in acute care settings: An extension of the UTAUT. *International Journal of Medical Informatics*, *84*(1), 36–47.

Mathews, A. L., Latronica-herb, A., & Latronica-herb, A. (2017). Using Blackboard to Increase Student Learning and Assessment Outcomes in a Congressional Simulation Learning and Assessment Outcomes in a, *2169*(January).

Mckeown, T., & Anderson, M. (2016). UTAUT : capturing differences in undergraduate versus postgraduate learning ? *Education + Training*, *58*(9), 945–965.

Mhouti, A. El, & Nasseh, A. (2016). Enhancing collaborative learning in Web 2 . 0-based e-learning systems : A design framework for building collaborative e-learning contents. *Education and Information Technologies*.

Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of

TAM and IS success model. *Computers in Human Behavior*, *45*, 359–374.

Nair, P. K., Ali, F., & Leong, L. C. (2015). Factors affecting acceptance & use of ReWIND. *Interactive Technology and Smart Education*, *12*(3), 183–201.

Neo, T.-K., Neo, M., Kwok, W.-J., Tan, Y.-J., Lai, C.-H., & Zarina, C. E. (2012). MICE 2.0: Designing Multimedia Content to Foster Active Learning in a Malaysian Classroom. *Australasian Journal of Educational Technology*, *28*(5), 857–880. Retrieved from http://www.ascilite.org.au/ajet/ajet28/neo.pdf

Newbury, P. (2016). Self-Summarized Video in Adaptive Collaborative E- Learning Environment, 770–780.

Ngampornchai, A., & Adams, J. (2016). Students' acceptance and readiness for E-learning in Northeastern Thailand. *International Journal of Educational Technology in Higher Education*, *13*(1), 34.

Obadi, G., Dr????dilov??, P., Martinovi??, J., Slaninov??, K., & Sn????el, V. (2010). Finding patterns of students' behavior in synthetic social networks. *Proceedings - 2010 International Conference on Advances in Social Network Analysis and Mining, ASONAM 2010*, 411–413.

Osman, M., & Chung, P. W. H. (2011). Language Learning using Texting and Wiki : A Malaysian Context, 1888–1903.

Oye, Iahad, Rabin, Z., Lahad, & Rabin, Z. (2011). A Model of ICT Acceptance and Use for Teachers in Higher Education Institutions. *International Journal of Computer Science & Communication Networks*, *1*(October), 22–40.

Padilla-Mel??ndez, A., Garrido-Moreno, A., & Del Aguila-Obra, A. R. (2008). Factors affecting e-collaboration technology use among management students. *Computers and Education*, *51*(2), 609–623.

Popovici, A., & Mironov, C. (2015). Students' Perception on Using eLearning Technologies. *Procedia - Social and Behavioral Sciences*, *180*, 1514–1519.

Punnoose, A. C. (2012). Determinants of intention to use eLearning based on the technology acceptance model. *Journal of Information Technology Education:Research*, *11*(1), 301–337. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84877639303&partnerID=tZOtx3y1

Raes, A., Schellens, T., De Wever, B., & Vanderhoven, E. (2012). Scaffolding information problem solving in web-based collaborative inquiry learning. *Computers and Education*, *59*(1), 82–94.

Raman, A., Mohd, R., & Kaur, P. (2014). Facebook as a Collaborative and Communication Tool : A Study of Secondary School Students in Malaysia. *Procedia - Social and Behavioral Sciences*, *155*(October), 141–146.

Review, I., Learning, D., & View, E. (2017). Assessing acceptance toward wiki technology in the context of Higher Education, (March).

Sadaf, A., Newby, T. J., & Ertmer, P. a. (2012). Exploring factors that predict preservice teachers' intentions to use Web 2.0 technologies using decomposed theory of planned behavior. *Journal of Research on Technology in Education*, *45*(March), 171–195.

See, J., Lim, Y., Agostinho, S., Harper, B., & Chicharo, J. F. (2013). Investigating the use of social media by university undergraduate Informatics Programs in Malaysia. *International COnference on Educational Technologies*, 143–147.

Shittu, A. T., Basha, K. M., AbdulRahman, N. S. N., & Ahmad, T. B. T. (2011). Investigating students' attitude and intention to use social software in higher institution of learning in Malaysia. *Multicultural Education & Technology Journal*, *5*(3), 194–208.

Shu, W., & Chuang, Y.-H. (2011). The Behavior of Wiki Users. *Social Behavior and*

Personality: An International Journal, *39*(6), 851–864.

Stantchev, V., Prieto-Gonz??lez, L., & Tamm, G. (2015). Cloud computing service for knowledge assessment and studies recommendation in crowdsourcing and collaborative learning environments based on social network analysis. *Computers in Human Behavior*, *51*, 762–770.

Stockleben, B., Thayne, M., Jäminki, S., Haukijärvi, I., & Thayne, M. (2016). Towards a framework for creative online collaboration : A research on challenges and context. *Education and Information Technologies*.

Summers, J. J., Beretvas, S. N., Svinicki, M. D., & Gorin, J. S. (1995). Evaluating Collaborative Learning and Community. *Learning and Instruction*, *5*(1), iii.

Tajudeen, S. A., Isiaka, G. A., Olalere, Y. M., & Thomas, A. O. (2015). Confirmatory factor analysis of the dimensionality of students' readiness of using social media for learning in Nigeria. *Journal of Science, Technology & Education*, *3*(2), 109–121.

Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers and Education*, *57*(4), 2432–2440.

Teo, T., & Zhou, M. (2014). Explaining the intention to use technology among university students: A structural equation modeling approach. *Journal of Computing in Higher Education*, *26*(2), 124–142.

Toh, C. H. (2013). ASSESSING ADOPTION OF WIKIS IN A SINGAPORE SECONDARY SCHOOL : USING THE UTAUT MODEL, 1–9.

Usoro, Abel; Echeng, R. (2015). Model of acceptance of Web 2.0 technologies for increased participation in learning activities A case study of a Scottish university. *International Journal of Intelligent Computing and Cybernetics Model*, 1–6.

Visuvalingam, V. (2006). A conceptual framework to explain technology acceptance of electronic negotiation utilizing software agents.

Vivian, R., Falkner, K., Falkner, N., Vivian, E. R., Falkner, K., & Falkner, N. (2013). Building consensus : students ' cognitive and metacognitive behaviours during wiki construction, 154–161.

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Yueh, H. P., Huang, J. Y., & Chang, C. (2015). Exploring factors affecting students' continued Wiki use for individual and collaborative learning: An extended UTAUT perspective. *Australasian Journal of Educational Technology*, *31*(1), 16–31.

Zhu, C. W., Ph, D., Vasquez, C. C., Ph, D., Chen, Y., Ph, D., … Ph, D. (2015). The Effects of Blog-supported Collaborative Writing on Writing Performance , Writing Anxiety and Perceptions of EFL College Students in Taiwan by Hui-Ju Wu A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Phi, (Cmc).

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