Effective Integration of Wiki for Collaborative Learning in Higher Education Context

Farrah Dina Yusop and Siti Mariam Muhammad Abdul Basar

Faculty of Education, University of Malaya, Malaysia

Abstract: Wiki is an asynchronous online collaborative tool thatcan be adapted for teaching and learning purposes. This study attempts to explore and develop a further understanding of the factors influencing students' participation and commitments in collaboration using wiki in a higher education context. The usage of wiki to support class instruction will also be evaluated. Findings from online wiki observations were found to be positive in terms of students' participation in their wiki pages. Six factors have been identified as playing important roles in motivating and engaging students in collaborative writing practices via wiki. An interesting finding emerging from this study was that different motivation and engagement levels between undergraduate and postgraduate students were attributed to their roles as part-time students. The findings of this study will provide instructors an understanding of the elements that could either encourage or hinder students' motivation and participation in wiki activities.

Key words: Wiki · Collaborative learning · Online learning · Higher education

INTRODUCTION

It is not uncommon for people in a given society to do or discuss things, whether they be working on a paper with a classmateor a simple act of discussing what is happening in the evening news. This is a simple exampleof anact of collaboration and Dillenbourg [1], broadly described the term "collaborative learning" as "a situation where two or more people learn or attempt to learn something together".Collaborative learning can be seen as an alternative to traditional classroom teaching in whichthe instructional method is more teacher-centered. Collaborative students are given authority to examine and explore the learning components and make meaning from themthrough discussion with their peers.

This paper focuses on collaborating using technology, namely wiki, for teaching and learning purposes in a higher-education context. Past studieshave been conducted on the implementation of wiki for teaching and learning purposes. Those studies found that wiki is beneficial in assisting group work and encouraging better individual participation and interactions among group member in wiki enhanced the progress of group work. Another study by Franco (2008) examining wiki activities for writing purposes reported that students'

writing opportunities were maximized, interest and motivation were increased, writing skills were improved and they learned cooperatively instead of competing with each other. The commenting feature in wiki enabling fellow students or an instructor to write commentson to students' workwasproven useful in helping them to learn. This causes students to be more aware of their writing process and motivates them to performbetter due to the public nature of wiki.

Technology can be used to enhance the teaching and learning processes and to accommodate students with different needs and abilities, thus resulting in fuller realization of their capabilities and potential. However, past researchers have found that not all educators are willing to embrace the change from conventional instructional methodology to incorporating technology into their teaching. Oliver and Omari [2] explored Australian university undergraduates' responses with respect touse of a web-based environment to support collaborating and learning and found that almost half the students stated that they didnot favor the new form of learning, although they have stated a level of enjoyment and satisfaction in using an online learning setting. Therefore, this study is committed to exploration and development of a further understanding of the factors

---

Corresponding Author: Farrah Dina Yusop, Faculty of Education, University of Malaya, Malaysia.

influencing students inhigher educational institutions when working together in a collaborative manner. This willalso help learners to appreciate and realize the potential of technological toolsthatcan be used to enhance the learning process. This study will also look into students' perspectives regarding their involvement and contribution in collaborating using wiki.

Web 2.0 Technology: Web 2.0, according to Anderson (2007), is a "group of technologies which facilitate a socially-connected Web where everyone is able to add and edit the information space". The core characteristics of Web 2.0, as highlighted by O'Reilly (2007), was "trusting users as co-developers and harnessing intelligence." The vast availability of Web 2.0 technologies, like wikis, social networking sites, blogs, media sharing sites and many others, can be beneficially utilized and adapted by educators using its potential fortransforming the learning experience[3, 4]. The ability of Web 2.0 in enhancing education, as claimed by Boyd [5], is "due to the sociability aspects, where it is able to support three ingredients that characterize learner-centred instruction, namely: (i) support for conversational interaction, (ii) support for social feedback and (iii) support for social networks and relationships between people."

Wiki as a Means for Supportingcollaboration: Wiki, a type of Web 2.0 technology, is an asynchronous and simple web-based collaborative authoring system that can be defined as "a webpage or set of web pages that can be easily edited by anyone who is allowed access". It was created in 1995 by Howard Cunningham as a systemfor developingprivate and public knowledge bases.

According to Wheeler, Yeomans and Wheeler (2008), the word 'wiki' originates from the Hawaiian term *wiki wiki* which can betranslated as 'to hurry'. This suggests the idea that Wiki enables rapid and easy authoring directly to the Web. The dynamic nature of wiki enables an educator to create an innovative learning environment thatexpands the possibilities forinteraction, knowledge-sharing and facilitation oflearning activities. Using a wikitool, learners as well as instructors can communicate, share information and documents and work together in a virtual environment regardless of their geographical location and time.

This study intends to develop a further understanding of the factors influencing effective wiki integration in the context of higher education.

Methodology: This study employs a mixed method approach in its design. Online surveys were distributed to 30 students from a public university in Malaysia. Thispopulationconsisted of both part-time and full-time learners with ages ranging from 20 to 39 years. The courses were designed to fit into ablended learning environment setting and implemented the usage of wiki to supplement classroom instruction. The surveys were then followed up with analyses of students' online activities and their written reflections on their wiki experiences.

Participants and Context: The participants of this study were 25 undergraduates enrolled in Principles of Instructional Technology course and 5 postgraduates from an Advanced Instructional Design and Technology course. During the fourteen-week course, instructional activities were conducted face-to-face (F2F) atthe university campus, whilethe course project and associated learning activities were conducted online via Wikispaces (www.wikispaces.com). Wikispaces is an open-sourced platform, meaning that it is freely available for everyone to use.

The participant group was comprised of 5 (16.7%) males and 25 (83.3%) females. The age ranges of participants were 20-24 years old (80%), 25-29 years old (10%), 30-34 years old (6.7%) and 35-39 years old (3.3%).

Course Design: The undergraduate course's wiki was available at http://ppet3104.wikispaces.com/(Figure 1) while the postgraduate course's wiki was available at http://pxgt6302.wikispaces.com/ (Figure 2). The courses were designed as student-centered workshops in which students were actively engaged in communicating and working on their wiki pages while also attending lectures. Students were given guidelines on how to use wiki and to familiarize themselves with wiki during the first classroom session. This wasan important step to ensure that all learners werefamiliar with wiki features and no onewasleft out due to incompetency in its use

The undergraduate course project required students to work collaboratively in small groups of 3 to 4 people in which they wrote and produced a collaborative book bythe end of the semester. In contrast, the each postgraduate wasrequired to work individually on a book chapter and produce a collaborative book bythe end of the semester. The wiki activities and pages were made viewable to everyone in the class to enable other students to view and provide constructive comments on each other's work. The activity of correcting peers' mistakes can help students in their writing progress [6].
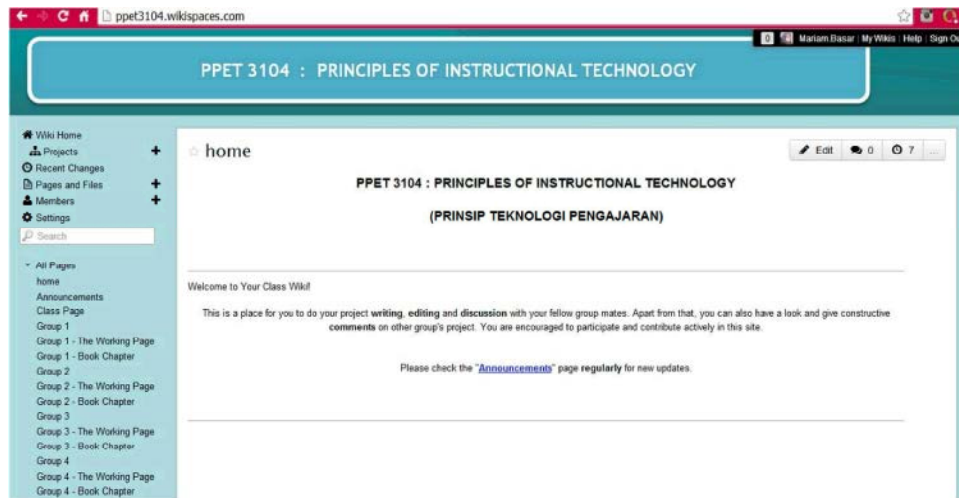
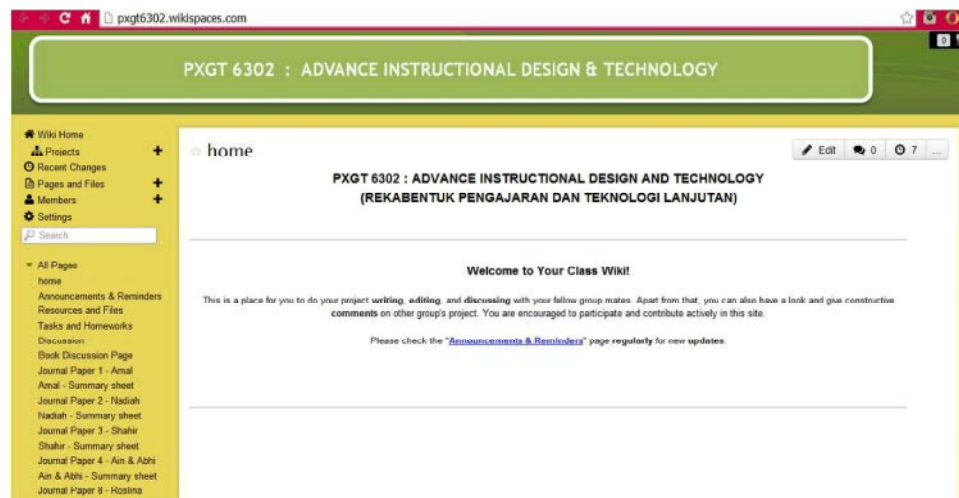Fig. 1: A screenshot of the undergraduate course's wiki front page

Fig. 2: A screenshot of the postgraduate course's wiki front page

Students were constantly encouraged by the instructor to keep them motivated and actively online throughout the course sessions. In the wiki activities, students were required to actively take part using their wiki pages, while the course instructor, in the role of facilitator and moderator, monitored the online activities and encouraged active participation.Even though online participations were not graded, the tracking progress in wiki helped the instructor to observe students' contributions towards their writing task and to ensure that everyone participated so that task responsibilitieswere evenly distributed among group members.

Data Collection Method: Online surveys comprised of both closed and open-ended questions were administered to obtain feedback from respondents at the end of the semester and prior to the final exam. Closed-ended responses were based on a five-point Likert-type scale with the response format ranging from1 (strongly disagree) to 5 (strongly agree). The survey contained sixsections: Section A (Demographic Characteristics), Section B (Computer, Internet and Wiki Technology), Section C (Course Structure), Section D (Evaluation of Using Wiki to Support Class Instruction), Section E (Learner's Perception Towards Wiki) and Section F (Instructor Characteristics).

Additionally observations of students' wiki activities were carried out throughout the semester using the wiki log pages. Analyses of students' written reflections of their wiki experiences and wiki logs were also conducted as a means of triangulation.

Findings: This study intends to identify factors influencing effective integration and use of wiki in higher-education settings from the participants' point of view. The sixidentified factorswere:

Table 1: Descriptive measures of learners' technological background

	Frequency	Percentage (%)
Level of computer expertise		
No experience	-	0
Less competent in using advanced features	3	10.0
Fairly competent in using advanced features	17	56.7
Competent in using advanced features	10	33.3

Characteristics of the Learners: The mostimportant learner characteristic wasprior knowledge about and skill in using basic computer applications such as word processing software, spreadsheet, presentational tools and Internet search. Throughsuchknowledge and skill learners prove that they understand basic computer instructions such as saving, uploading, downloading and renaming files, as well as understanding the web navigation process. These are among the most basic skills needed to operate a wiki.

Our participants reported that they feltcompetent in using advanced computer software features, such as word processing, Internet information searching, spreadsheet and presentation (Table 1). Only a small number (3, 10.0%) stated that they wereless than competent in using advanced computer software features.

Off-campus Access to the Internet: Wiki is an online-based application, so it is crucial forlearners to have access to the Internet, especially both before and after classroom hours. The majority (63.3%)of participants in this study reported that they could access the Internet for coursework purposes off campus, such as from a home or a hostel. The remaining 36.7% had on-campus access, such as at the library or in faculty offices.

These figures show that majorityof participants preferred to use wiki off-campus. This situation is understandable since more than 60% of the students reported that theyhad undertaken 16 to 21 credit hours in the semester this study was conducted. This heavy courseload per week signifiesthat their time on campus was spent on attending courses and having face-to-face group discussions rather than working on collaborative wiki assignments.

Initial Hands-on Exposure to Wiki: 80% of the students were first-time wiki users and that this course was their first exposure to wiki. Consequently they were "fearful" (Andy, written reflection 1) and hesitant to use it after the instructor announced that they were required to complete their assignments on wiki. However, they reported that

the first hands-on training given by the instructor on how to operate wiki helped them overcome their fears. Another student wrote in her written reflection:

> *"Wiki-based participation can be improved if students be given a training before they used. There are many functions in wiki so if we can know to handle wiki in more details then that will be good for us."*(Hannah, reflection 1).

The researchers noted that, once students became familiar with, they soon became active wiki users.This finding is supported by a survey in which 60% of the students reported that they participated in wiki once a week or more, 23.3% participated once a week, while the remaining 16.7% worked on wiki once a month throughout the course. Participation in this study refers to the activities conducted by students on wiki beyond just logging in and reading and includedsuch activities as commenting on peers' work, sharing additional resources with peers and editing peers' writings.

The Importance of Peer Contributions: Participants in this study agreed that contributions fromevery member are important in ensuring that the assigned work was completed within the timeline. Lee in the survey mentioned:

> *"…the quality produced for the book writing is very crucial. The more commitment you put for the book writing (project), the less time you'd spent on editing the mistakes (grammar/ plagiarism)"*(Lee, exit survey).

Another interesting finding is that peer contributions in wiki actually motivate the rest of the class members to contribute to wiki. It was evident from the wiki log that, once a group member posted his or her writings on wiki, the other members in the group would usually soon write back to him or her. We theorize that this phenomenon could be related to the concept of community of practice [7] in which students in such courses consider themselves to be active participants in course communities and thus feel responsible to assist in each other's learning by contributing knowledge they have gained from readings and Internet searching with their peers. Through such participation, as the course develops these students can gradually form a social learning group to support each other's development via wiki.

Technical Feasibility of Wiki: The participants in this study had a moderate positive perception towards completing their writing tasks using class wiki ($\mu=3.84$)in contrastto using traditional pen-and-paper method ($\mu=3.77$). Students did report having technical problems in editing their writings online and this may be due to two reasons: slow Internet connections and the wiki features themselves. A student, Nani, commented:

"Sometimes I do face some problem with Wikispace, especially in the editing part. It's not user-friendly enough. Or maybe we're not used to wiki that's why we may face some difficulties"(Nani's written reflection 2).

Another student supported the statement by stating:

"First it was new, not familiar for me and I found it difficult for me to use in the beginning."(Ranee, exit survey).

The Importance of Instructors' Comments on Students' Work: Despite the technical difficulties students sometime encountered, it was evident that they were always looking forward to the instructor's comments and feedback in their wiki work. This finding relates to the high mean response score ($\mu=4.27$)to a survey statement*comments from the lecturer boosted my confidence in writing with wiki.* The survey used a five-scale Likert-scale, where 1 refers to Strongly Disagree, 2 to Disagree, 3 to Neutral, 4 to Agree and 5 to Strongly Agree.

This finding could be further supportedby comments such as *"lecturer's comments helped me to complete my task in wiki"(Nadia, written reflection 2)* and *"on wiki, (instructor's) comments or criticism can be highlighted, which enables the writing process to go smoothly"(Ang, exit survey).*

However, there was one comment made from a student who reported disapproval with respect to openly receiving instructor's feedback onwiki, *"lack of privacy to get feedback from my supervisor."*

CONCLUSIONS

The findings of this study reveal that students had positive perceptions towards the use of wiki in their collaborative writing exercises. Analyses of surveys, online observations, students' written reflections and wiki logs revealed that the students, especially the full-time undergraduates, were highly positive, engaged and motivated to use wiki to supporttheir collaborative projects. The majority of the students' participated and posted at least once a week ontheir wiki group pages. Some of the groups even created their own internal and private wiki groups to complete their group work project.

Of greatest importance, this study identified six important factors that affect active wiki participation and engagement among students. They are:

* Characteristics of the learners
* Off-campus access to the Internet
* Initial hands-on exposure to wiki
* The importance of peer contributions
* Technical feasibility of the wiki
* The importance of instructor's comments on student work

Another interesting findings emerging from this study were the differences in perceptions and engagement level on wiki among the two groups of students, i.e., full-time undergraduates and part-time postgraduates. It was noted that the undergraduates were more eager and engaged in exploring wiki than were the postgraduates. Compared to the postgraduates they were also more active in sharing their thoughts and additional resources with their peers.

In contrast, postgraduate students were found to be quite passive in terms of their wiki activities. They logged into class wiki to submit the assigned tasks only on the days the tasks were due. They additionally seemed not motivated to explore other features of wiki such as text coloring and comments. The majority of them opted to attach their works to their wiki pages when they were expected to write in it.

Postgraduate students' hesitance to use wiki may be associated with their characteristics as mature, part-time students as evident in their written reflections. The majority admitted that they could not commit to the workshop nature of the course due to their work commitments. Consequently they chose not to "waste (their) time" (Maya written reflection 3) exploring an unfamiliar technological tool, i.e., wiki in the context of the study. Thus the attachment feature of wiki became their popular choice.

Future research may be devoted to study as to why the different patterns between undergraduate and postgraduate students exist and which instructional approaches could be applied to encourage greater postgraduate online participation.

ACKNOWLEDGEMENT

REFERENCES

1. Dillenbourg, P., 1999. "What do you mean by collaborative learning?," in Collaborative-learning: Cognitive and computational approaches., P. Dillenbourg, Ed., ed, pp: 1-19.

2. Oliver, R. and A. Omari, 2001. "Student responses to collaborating and learning in a web-based environment," Journal of Computer Assisted Learning, 17: 34-47.

3. Fard, H.E., Z. Tasir, A.A. Ziden and N. Esa, 2010. "A Case Study on Blog's Effects as a Learning Activity in Higher Education Environment," World Applied Sciences Journal, 9: 567-572.

4. Kravets, A.G., A.S. Gurtjakov and A.P. Darmanian, 2013. "Enterprise Intellectual Capital Management by Social Learning Environment Implementation," World Applied Sciences Journal, pp: 23.

5. Boyd, D., 2007. "The significance of social software," in Blog Talks reloaded: Social software research and cases, T.N. Burg and J. Schmidt, Eds., ed Norderstedt, Germany, pp: 15-30.

6. Woo, M., S.K.W. Chu, A. Ho and X. Li, 2011. "Using a Wiki to Scaffold Primary-School Students' Collaborative Writing," Educational Technology and Society, 14: 43-54.

7. Lave, J. and E. Wenger, 1991. Situated learning: Legitimate peripheral participation: Cambridge university press.