Where is the wiki in Wiki?

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This is a small scale case study of a group of graduate students exploring the use of wiki for meaningful interaction and learning community-building. The wiki was used to facilitate communication, cooperative work and to support each other to reach the course assignment objectives and goals. A general analysis of the wiki reveals that while the students were highly interactive in the discussion and comments part of the wiki, the real publishing of content and editing were found lacking in this group interaction. However, though there were lacking activities in the new page creation and editing, the interaction among the students in the comment's section was found to be highly engaging and meaningful, exhibiting the substantial amount of in-depth level processing while a reasonable amount of cognitive and meta-cognitive skills were present. Other issues were also highlighted and discussed.

Keywords: wiki, cooperative learning, team work, meaningful interactions, learning community-building

Introduction

There has been a revolution in higher education systems to push for a more active learning environment rather than mere transmission of knowledge. Here, as Andrews (2005) aptly puts it that knowledge becomes more of a relationship (i.e. engaging, personal and meaningful) rather than a commodity. The process of knowing seems to be more crucial and critical rather than knowledge itself. This emphasis naturally led to the building of knowledge communities, a significant issue in the education arena, particularly online communities. A community is formed when there are active interaction, common interests and values. It is said that the key to effective learning communities is "the interactions among students themselves, the interactions between faculty and students, and the collaboration in learning that results from these interactions" (Palloff & Pratt, 1999, p.5). Yet, it is not uncommon, even at a graduate level, for students to comfortably slip into the role of passive recipients of knowledge, feeling isolated and disconnected from the rest of the classmates.

This study shares an experience of a group of graduate students attempting to move away from the traditional role of students into more active and interactive learners while building a learning community on their way. This move in itself can be problematic and challenging as one would see as the experience is revealed in the paragraphs to come.

Wiki as the catalyst for cooperative learning

Though some researchers use the term collaborative and cooperative interchangeably, this study refers collaborative learning to methods or approaches where students work together in groups with the focus on student interactions rather than learning on their own. While collaborative work encompasses all group based activity, cooperative learning in turn refers to a small group of students working towards a common goal or objective while being assessed individually (Miller & Cottell, 1998). Lin and Hsieh (2001) summarize the key pedagogical assumptions of the cooperative learning model as "knowledge is created as it is shared, and the more it is shared, the more is learned"; "learners have prior knowledge, they can contribute to the discussion", "participation is critical to learning"; and "learners will participate if given optimal conditions such as small groups to work interactively" (p. 379). While working and learning cooperatively, a community of connected learners with common interests (i.e. achieving the goals of the

course assignment) tend to emerge rather than unhealthy competition in individualize learning, which tends to segregate the students.

All the pedagogical or instructional methods mentioned above falls under the bigger umbrella of the constructivist paradigm. One of the difficulties of the constructivist approach is its impracticality to be transferred into a real classroom (Jonassen, 1991). It seemed that the characteristics of emergent technologies such as wiki (i.e. collaborative in nature, support group processes and peer interactions, enables sharing and distribution of knowledge with ease) are well suited to augment the model of cooperative learning in the constructivist environment. Recent literatures highlighted the usefulness of wiki to facilitate active learning, promote cooperation among students (Anson & Miller-Cochran, 2009; Augar, Raitman & Zhao, 2004; Parker & Chao, 2007) and provides opportunities for reflective thinking (Chen, Cannon, Gabrio, Leifer, Toye & Bailey, 2005). Wikis also provide an efficient, flexible, user friendly and cost-effective interface for collaboration, virtual presence, knowledge creation and archiving, and student interaction (Schwartz, Clark, Cossarin, & Rudolph, 2004). The potential of wiki in facilitating the constructivist pedagogy seems promising with its easy and flexible functions that need minimal technical experience. Parker and Chao (2007) described the ability of wiki to support collaborative and cooperative learning while Palloff and Pratt (1999) claimed that interaction among students as one of the keys to the learning process. Ramanau and Geng (2009) also expressed the importance of taking account of student experiences to ensure positive engagement within the wiki. Hence, this study seeks to investigate the process of community building within a student-initiated wiki, the students' perceptions on team work and cooperative learning as well as their experiences in using the wiki, and finally, the quality of interaction among the students.

Student-initiated wiki for meaningful interaction and knowledge-building

Participants and setting

This research involves all the students (n=11) of a course at the Master's level. The students consist of mixed nationality where there were five males and six females. Four of the students are from Malaysia, six from Iran and one from Saudi Arabia. About 45% of them have used the wiki before taking this course and only one of them (9%) had experience in creating or started a wiki content. All the students are comfortable in using the computer and are frequently (few times a day) on the internet. However, only one of them said he or she frequently (few times a day) use the wiki for this course, four others use it once in 1 or 2 days, three others use it occasionally (once in 5-6 days) while the rest three seldom (once in 1-2 weeks) use the wiki. It is the first time, however, that all the students are using the wiki for academic purposes in a formal class.

The context: wiki in Human Performance Technology course

This compulsory graduate course, Human Performance Technology (HPT) is offered to students who are taking Masters of Multimedia in E-Learning Technologies program. This class takes a constructivist approach focusing on active participation from the students. Minimal lectures are given while great autonomy is given to the students to be co-construction of knowledge instead of relying on the "experts", as learners in an objectivist learning environment often do. This course covers 14 weeks with great numbers of weeks used for student's presentation of the course content. At the beginning of the semester, students were given a brief introduction of the subject and were subsequently given a model of HPT for further exploration. Each part of the model was assigned to each student randomly for further research and was expected to present and "teach" his or her part to the rest of the students during class. At the end of the semester, the group of students was expected to integrate all the parts of the model and do a final presentation of the whole process of the HPT model. All of these presentations (individual and group) are given grades and are part of the assessment of the course.

One of the more active students suggested the use of wiki to facilitate meaningful interaction and knowledge-building among the students. This emerging technology seems to fit the objective of the course that is to collaboratively and cooperatively construct knowledge. Unlike other courses in previous research on wiki, this is a student-initiated wiki where the instructors have no autonomy over but were invited to participate as peers and co-creators of the wiki content. The students took charge all aspects in handling of the wiki from the selection of appropriate free public hosted wiki, creating the wiki to how-to-use the wiki. All works uploaded, edited, discussed within the wiki are not part of the formal assessment of the course.

Method and approach

This small scale case study utilizes both quantitative and qualitative approach to understand students' use of the wiki in meaningful interactions and knowledge building. For quantitative data, an online questionnaire survey was administered to obtain students' experience and insights on their use of wiki for team work and cooperative learning. The questionnaire consists of several sections, which include: 1) Demographic and Students' prior experience on using the wiki, 2) Students' general perceptions on using the wiki for team-work and collaborative/cooperative learning [statements are adopted from Coyle's student collaboration survey scale (2007)] and 3) Students' general perceptions on their sense of belonging and the community of learning in the wiki [statements are adapted from Rovai's community scale (2002)]. Open-ended questions were included to gain more insights and personal feedback from the participants on their experience with wiki.

For qualitative data, the content analysis approach was used to examine the activities, interaction and discussion/comments that took place within the wiki. The framework for this part of the study combined the approach taken by Hara, Bonk and Angeli (2000) and Guan, Tsai and Hwang (2006), both modified from Henri's (1992) instrument of analyzing online interactions. Although the primary analyzes of Henri's model is based on cognitivist approach, concepts of cooperative learning and collective knowledge is also addressed in the instrument (De Wever, Schellens, Valcke, & Van Keer, 2006). The categories of messages were simplified into four dimensions: participation rate, social cues, interaction types, cognitive and meta-cognitive skills. Participation rate reflected the number of messages posted by the students on average. Social cues reflected the statements that were not related to the formal content of discussion or subject matter but represented the social presence. For interaction types, four categories were used which includes the *direct response*, *indirect response*, *independent statement*, and *others*. As for the cognitive skills, the categories are *elementary clarification*, *in-depth clarification*, *inference*, *judgment*, and *application of strategies*. Finally, the meta-cognitive skills involve *evaluation*, *planning*, *regulation*, *self-awareness*, and *reflective on experience*.

Results and analysis

Students' perceptions on cooperative learning and sense of community in wiki

All the students responded to the online questionnaire. Closed and open-ended questions solicited students' perceptions on team work and cooperative learning, sense of community within wiki, and their experience interacting and collaborating in wiki. A 5-point Likert-type scale was employed with 1 to 5 representing for *Strongly Disagree*, *Disagree*, *Neutral*, *Agree*, and *Strongly Agree*. Table 1 summarizes the results of the general perceptions of students on team work and cooperative learning.

Table 1: General perception on team work and cooperative learning

1=Strongly Disagree, 2=Disagree, 3=Agree, 4=Strongly Agree

	1	2	3	4	5	Mean
I understood the objectives of this assignment.	1 (9.1%)	0 (0%)	0 (0%)	7 (63.6%)	3 (27.3%)	4
I understood my individual responsibilities in this assignment.	1 (9.1%)	0 (0%)	2 (18.2%)	6 (54.5%)	2 (18.2%)	3.36
I was serious about making the group work successfully.	0 (0%)	1 (9.1%)	1 (9.1%)	5 (45.5%)	4 (36.4%)	4.1
All the other members of the group were serious about making the group work successfully.	1 (9.1%)	2 (18.1%)	1 (9.1%)	4 (36.4%)	3 (27.3%)	3.55
Our group was task-oriented.	0 (0%)	2 (18.2%)	1 (9.1%)	6 (54.5%)	2 (18.2%)	3.72
I frequently contributed new information to the group assignment.	0 (0%)	1 (9.1%)	4 (36.4%)	6 (54.5%)	0 (0%)	3.45
The other members of my group respectfully listened to or read my input when offered.	0 (0%)	0 (0%)	3 (27.3%)	6 (54.5%)	2 (18.2%)	3.91
Everyone's quality ideas were respected.	0 (0%)	0 (0%)	0 (0%)	6 (54.5%)	5 (45.5%)	4.45
I frequently changed other group members' information in the group assignment.	0 (0%)	6 (54.5%)	3 (27.4%)	1 (9.1%)	1 (9.1%)	2.73
All members of my group worked well together.	0 (0%)	2 (18.2%)	0 (0%)	5 (45.5%)	4 (36.3%)	4
I worked harder than most other members of my group.	0 (0%)	8 (72.2%)	1 (9.1%)	1 (9.1%)	1 (9.1%)	2.54

Our completed work comprehensively covers the topic.	0 (0%)	1 (9.1%)	0 (0%)	8 (72.2%)	2 (18.2%)	4
Our completed work includes a sufficient number of relevant references.	0 (0%)	0 (0%)	5 (45.5%)	6 (54.5%)	0 (0%)	3.55
Our completed works spelling, punctuation, capitalization, and grammar are accurate and correct.	0 (0%)	3 (27.3%)	1 (9.1%)	7 (63.6%)	0 (0%)	3.36
Our completed work demonstrates a thorough understanding of important concepts and provides new insight that will be useful to professionals involved in this field.	0 (0%)	1 (9.1%)	1 (9.1%)	8 (72.2%)	1 (9.1%)	3.82

In general, the findings reveal that this group of graduate students is comfortable working in a group and values team work. Majority of them understood the objectives of the course assignment and are clear of their individual tasks and responsibilities. When asked if they were serious in making the group work successful, 81.9% of them agreed, which reflects their commitment to working cooperatively. 81.8% of them felt that all members of the group worked well together while 72.7% agreed that the group was task-oriented. The findings also reveal that majority of the students respected each other and value each other's contribution to the group work. 100% of the students felt quality ideas were respected and that others were welcoming of their ideas and input (72.7%). A huge percentage of the students also expressed their satisfaction with the outcome of the group work (90.4%). However, more than half the students were

Table 2: General perception on sense of belonging and community in wiki

1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree

	1	2	3	4	5	Mean
I feel that students in this wiki care about each other.	0 (0%)	0 (0%)	3 (27.4%)	3 (27.4%)	5 (45.5%)	4.12
I feel that I am encouraged to ask questions.	1 (9.1%)	1 (9.1%)	1 (9.1%)	5 (45.5%)	3 (27.4%)	3.73
I feel connected to others in this wiki.	0 (0%)	1 (9.1%)	1 (9.1%)	4 (36.3%)	5 (45.5%)	4.18
I feel that it is hard to get help when I have a question.	4 (36.3%)	5 (45.5%)	1 (9.1%)	1 (9.1%)	0 (0%)	1.91
I do not feel a spirit of community in this wiki.	2 (18.2%)	7 (63.6%)	1 (9.1%)	1 (9.1%)	0 (0%)	2.09
I feel that I receive timely feedback.	0 (0%)	0 (0%)	3 (27.4%)	7 (63.6%)	1 (9.1%)	3.82
I feel that this wiki is like a family.	0 (0%)	2 (18.2%)	3 (27.4%)	4 (36.4%)	2 (18.2%)	3.55
I feel uneasy exposing gaps in my understanding.	0 (0%)	6 (54.5%)	5 (45.5%)	0 (0%)	0 (0%)	2.45
I feel isolated in this wiki.	3 (27.4%)	5 (45.5%)	1 (9.1%)	2 (18.1%)	0 (0%)	2.18
I feel reluctant to speak openly.	3 (27.4%)	3 (27.4%)	2 (18.2%)	3 (27.4%)	0 (0%)	2.45
I trust others in this wiki.	0 (0%)	0 (0%)	0 (0%)	7 (63.6%)	4 (36.4%)	4.36
I feel that this wiki results in only modest learning.	1 (9.1%)	0 (0%)	6 (54.5%)	2 (18.2%)	2 (18.2%)	3.36
I feel that I can rely on others in this wiki.	0 (0%)	1 (9.1%)	5 (45.5%)	3 (27.4%)	2 (18.2%)	3.55
I feel that other students do not help me learn.	6 (54.5%)	5 (45.5%)	0 (0%)	0 (0%)	0 (0%)	1.45
I feel that members of this wiki depend on me.	0 (0%)	6 (54.5%)	3 (27.4%)	2 (18.2%)	0 (0%)	2.63
I feel that I am given ample opportunities to learn.	1 (9.1%)	1 (9.1%)	3 (27.4%)	5 (45.5%)	1 (9.1%)	3.36
I feel uncertain about others in this wiki.	0 (0%)	5 (45.5%)	5 (45.5%)	0 (0%)	1 (9.1%)	2.72
I feel that my educational needs are not being met.	1 (9.1%)	3 (27.4%)	6 (54.5%)	1 (9.1%)	0 (0%)	2.81
I feel confident that others will support me.	0 (0%)	0 (0%)	1 (9.1%)	6 (54.5%)	4 (36.4%)	4.27
I feel that this wiki does not promote a desire to learn.	2 (18.2%)	6 (54.5%)	2 (18.2%)	1 (9.1%)	0 (0%)	2.18

found to be vary in editing or correcting other group member's input or content. This might be due to their deeply rooted cultural background and tradition to up hold social harmony and avoiding conflicts in public.

Table 2 gives overview results of how the students perceive the sense of community within wiki. Findings reveal that there is a substantial level of trust and community building within the group of students. More than half of them (> 50%) agreed that their experiences within wiki were like a family, that they care for each other, felt connected to one another, able to rely on others while all the students felt they could trust others in the wiki. A high percentage of students (90.9%) also felt they were confident that others will support them in the wiki. In terms of learning, all of them agreed that other students contributed to their learning and 54.6% of them felt they were given ample opportunities to learn. 72.9% of them felt encouraged to ask questions while 27.4% were reluctant to speak openly. Majority of them, however, were not afraid to expose gaps in their understanding. As many as 72.7% felt timely feedback was given. When asked whether it was hard to get help when one has a question, 81.8% thought it was not.

Students were also asked to reflect and share in two open-ended questions at the end of the questionnaire. There were 1) Reflecting on your experience, what were the advantages and benefits of doing cooperative work with a wiki? 2) Reflecting on your experience, what were the disadvantages and major concern of doing cooperative work with a wiki?

Some of the advantages and benefits that the students expressed are:

- it is good for improve classmate communication about course.
- Being updated, collaboration.
- it got some useful tasks, for example : S.O put schedule for the whole groupmates to finish at the right time. can access any time to the materials, edit them ...
- having a centralized and focused place solely for the subject.
- Learning by doing, being active learner, participation, improve teamwork skills, sharing our ideas and understandings, learn from and with each other, student-center, edit each other works and be retrival-f2f.
- improves my understanding of the subject and i enjoy learning with it.
- we can shared and exchange ideas and it give us space and freedom in giving our own opinion.
- It was good to be updated online and being in contact with members of the class.

The disadvantages and major concerns listed by the students are:

- just communicate on wiki is not enough and we must speak face to face .it is disadvantage if we communicate just in wiki.
- no task-oriented.
- sometimes can not access through wiki , (no internet connection) then i ve missed a discussion in a day .and sometimes wiki server got problem ...
- Poor in features for easy navigation, latest updates reference and material locations.
- slow connection and uploading documents.it need more design opportunity and more template. lack of personal image and avator, sometimes don't know who speak to whom.
- have to wait for others response.
- not real time.
- online wiki is not cover the projects and face to face discussion is needed.

Analyses of interaction in wiki

A general analysis of the wiki reveals that while the students were highly interactive in the discussion and comments part of the wiki, the real publishing of content and editing were found lacking in this group interaction. For example, there were a total of 262 messages or comments in comparison to only 15 new page creation of content and 28 editing completed throughout the whole 14 week semester.

Table 3: New page creation and editing counts by students in wiki

	Total # of new page creation	Total # of editing
Initial weeks	12	14
Intermediate weeks	1	6
Final weeks	2	8

A semi-structured interview was conducted at the end of the semester to further understand the reasons of the lack of editing activities in the wiki. Here are some of the responses given by the students:

> I didn't write any things because , I thought always some guys exist for editing and I afraid if I edit it by myself make mistake , and I thought another person maybe don't need my edit. Sometimes I embraced to write something that all the people can read it, maybe it is related to my self-confidence and some times I thing if every one want to edit page, the page will be massy and we must have one person for edit page
>
> Actually editing the wiki pages take more time than putting comments .because giving the opinion by comments can be done in the first page when you enter wiki .it is much more easier than going to other pages and editing them. It was because sometimes it is not compulsory so i did the job only though the comments
>
> It was time consuming, I also didn't feel confident about my content to be published because we are student and we don't have that much knowledge. I thought everything has been shared face to face no need to post the content there, that's just waste of time.
>
> Because the discussion board is more instant and it is the first page one will see when they go to the wiki page. Also there is an understanding that comes to me naturally that I do not need to update my content (though I am also an administrator) regularly because of one active administrator who does the job
>
> I really didn't have time to post anything to wiki I just continued tracking people posts through my
> email.
> Most of the times I was tracking other posts and I didn't feel that it needs more editing.
>
> I had this though that you can add once and you can just comment on that not to edit the post. It was easier for me to comment in discussion board, takes less time and you can share everything faster. I somehow wanted to keep the original information so after comparing the original information and the comments reader can get a better understanding of what's happening.
>
> It was my first time using wiki and I wasn't familiar with its capabilities. I wasn't sure if my content is good enough to publish so I preferred to post them in discussion board and get feedback from there.

A content analysis was done to examine the quality of interaction among the students. The following tables (Tables 4-8) summarize the content that was analyzed in four dimensions: participation rate, social cues, interaction types, cognitive and meta-cognitive skills. These categories were modified and simplified from Henri's approach of analyzing computer mediated communication and interactions.

Table 4: Participation rate of students' comments in wiki

	Total # of comments	Average # of comments per student
Initial weeks	90	8.2
Intermediate weeks	84	7.63
Final weeks	88	8

The 14 week semester was divided into three periods: initial weeks (first 5 weeks), intermediate weeks (following 4 weeks), and the final weeks (the final 5 weeks) for this analysis. There were a total of 262 messages or comments among the students throughout the whole semester. From table 4, one can see that the students were quite consistent in their interaction via the comment's section of the wiki throughout the semester. A summary of the quality of the interaction types can be seen in Table 5. In general, *indirect. responses* (implicit or indirect reference to someone else's comments) count was higher than the *direct responses* (explicit or direct reference to someone else's comments) throughout the whole semester *Indirect responses* include uploading of related documents or web pages for sharing purposes. The number of *direct responses* (37.8%) was the highest during the intermediate weeks while there was a decline of *indirect responses* (55.1% => 47.2% => 37.2%) as they move towards the end of the semester.

Table 5: Interaction types of students' comments in wiki

*Total # of units	Direct response	Indirect responses	Independent statement	Others	*Total # of units
Initial weeks	29(21%)	76(55.1%)	15(10.9%)	18(13%)	138
Intermediate weeks	48(37.8%)	60(47.2%)	16(12.6%)	3(2.4%)	127
Final weeks	30(23.3%)	48(37.2%)	25(19.4%)	26(20.1%)	129
Total # of units	107(27.2%)	184(46.7%)	56(14.2%)	47(11.9%)	394

* Units are measured instead of by number of messages as each message might contain several ideas.

Independent statements are statements that stand alone and that have no reference to any responses or comments but is related to the subject matter under discussion. *Others* are statements that totally un-related to the subject under discussion. A visual mapping of the responses among the students was drawn to further illustrate the complex interactions that happen within the comment's section of the wiki. Figure 1 shows an example of the complex interaction among the students. The circles represent the students, lines with an arrow represent *direct responses*, dotted lines with an arrow represent *indirect responses*, lines with an arrow pointing to infinity symbol represent *indirect responses* that are directed to two or more students while the number next to the circle represents *independent statements*. *Others* are not represented as they do not contribute to the subject or topic being discussed. Figure 1 is the visual mapping of the final weeks' interactions. Here we can see visually that in general, students were quite engaged in the discussion except for two of the students were less active. Student E seems to be the most active.

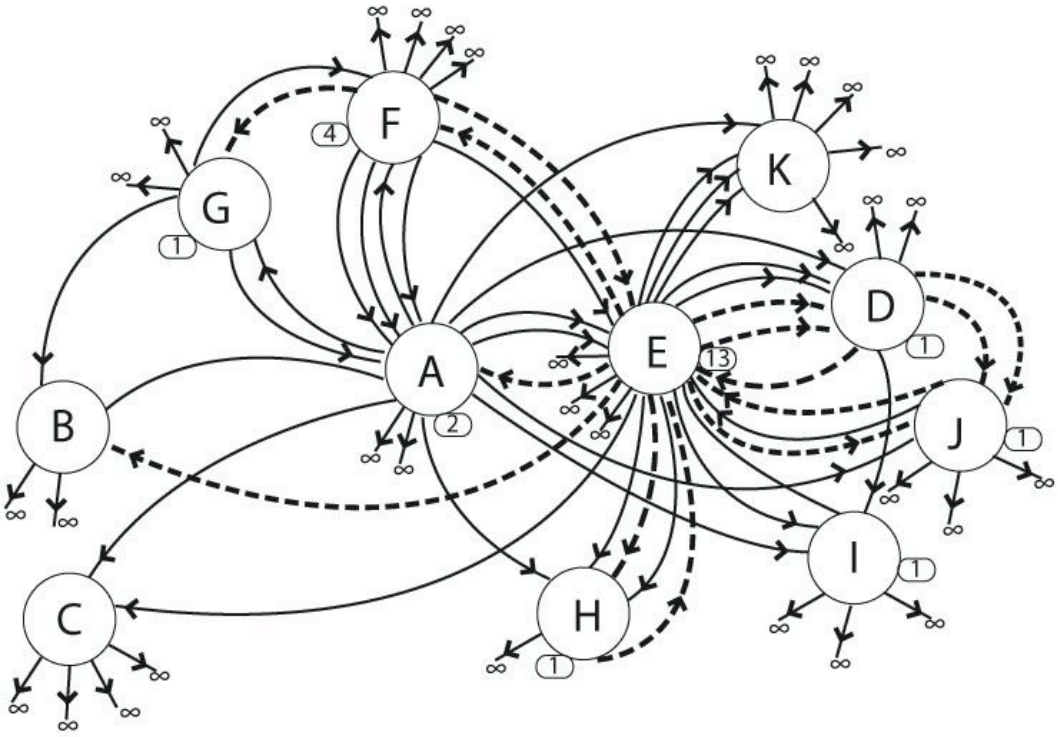

Figure 1: Example of a detailed visual mapping of interaction patterns

The analysis of social effects is considered important in this study as the success of any communities of practice is heavily depended on the level of social interaction of the community as well as their sense of belonging, level of trust and ability to depend on each other (Palloff & Pratt, 1999). The number of social cues (Table 6) was high during the initial and intermediate weeks, indicating high social interaction among the students. This is as expected as it is during these times the students are getting to know each other and in the midst of building relationships. This is much needed in any online communities as it helps the community to be more comfortable with each other, building a level of trust before real collaborative work begins. A drop in the social cue in the final weeks might be an indicator as stated by Henri (1992) that the students are more focused on the task, hence, less social interaction. A quick comparison between the cognitive skills (Table 7) and social cues in the final weeks shows that when social cues were at the lowest (27.9%), cognitive skills were recorded at the highest (41.9%). Hara, Bong and Angeli (2000) experienced similar findings in their study with online discussion, indicating that during those weeks, students were highly engaged and focused on the task at hand.

Table 6: Social cues of students' comments in wiki

	Total # of social cues	Total # of units
Initial weeks	51(36.9%)	138
Intermediate weeks	55(43.3%)	127
Final weeks	36(27.9%)	129
Total	142(36%)	394

Table 7: Cognitive skills of students' comments in wiki

	Elementary clarification	In-depth clarification	Inferencing	Judgment	Application of strategies	Total
Initial weeks	9(6.5%)	4(2.9%)	3(2.2%)	7(5.1%)	2(1.4%)	25(18.1%)
Intermediate weeks	4(3.1%)	16(12.6%)	9(7.1%)	15(11.8%)	3(2.4%)	47(37%)
Final weeks	27(20.9%)	8(6.2%)	5(3.9%)	13(10.1%)	1(0.8%)	54(41.9%)
Total # of units	40(10.2%)	28(7.1%)	17(4.3%)	35(8.9%)	6(1.5%)	126 (32%)

Throughout the whole semester, about one third of the interactions (32%) exhibited cognitive skills with *elementary clarification* being the highest. This is a reflection of the nature of the assignment that requires the students to identify relevant elements, asking relevant questions and requesting clarification of the HPT model that is to be studied. Higher order cognitive skills such as inferences and judgments were also present and most prevalent in the intermediate weeks. The results and break-down of each cognitive skill are summarized in Table 7. Collectively, the students advanced in their level of in-depth processing as revealed by the increase of evidence in their cognitive skills (18.1% => 37% => 41.9%).

Table 8 summarizes the results and break-down of the meta-cognitive skills. Overall, results reveal there are as many meta-cognitive skills as cognitive skills (31.2%) in the interactions among the students during the whole semester. The most frequent used skill was the *evaluation* (16.8%) which took place mostly during the initial and intermediate weeks. *Planning*, however, was exhibited most during the final weeks. This is understandable as it is during this time that the planning and execution of the final presentation were discussed and carried out.

Table 8: Meta-cognitive skills of students' comments in wiki

	Evaluation	Planning	Regulation and self-questioning	Self-awareness	Reflection on experience	Total
Initial weeks	35(25.4%)	1(0.7%)	1(0.7%)	4(2.9%)	4(2.9%)	45(32.6%)
Intermediate weeks	24(18.9%)	5(3.9%)	3(2.4%)	3(2.4%)	4(3.1%)	39(28.3%)
Final weeks	7(5.4%)	16(12.4%)	6(4.6%)	4(3.1%)	6(4.6%)	39(30.1%)
Total # of units	66(16.8%)	22(5.6%)	10(2.5%)	11(2.8%)	14(3.5%)	123(31.2%)

Discussion and conclusion

This study has highlighted several issues that surfaced when a group of post-graduate students utilized the wiki as a communication and cooperative tool to plan and execute their collective goal and objective i.e. their course assignments. Evidence revealed that students were hesitant to post new pages and edit other people's work in comparison to the comment section of the wiki. Students' were comfortable in commenting about each other works but rarely translate the comments into the action of real editing of the page. The main characteristic that defines wiki, compared to its Web 2.0 counterparts such as blog, social bookmarking and discussion forums, are its collaborative authoring capabilities. Users become co-creators of course content and constructing knowledge in a collective manner. This concept was rarely seen within this wiki but rather the focus was on engaging in dialog and sharing of information. Issues or reasons given were lack of confidence, lack of time, confused about the function of wiki page content, don't see the need to edit, and technical difficulties. Another prominent evident was that some students find commenting is more instant and faster posting in comparison to editing the page. Speed and immediate feedback were their concern. It's pretty obvious that there is a need for more scaffolding activities to address these issues. Many of the successful reports of the use of wiki in education were moderated by an instructor (Anson et al., 2009; Augar et al., 2006; Beach et al., 2008; Evans, 2006; Naish, 2006) and with proper guidance (Anson et al., 2009; Notari, 2006). This particular wiki was not created and moderated by an instructor but instead was initiated by the students themselves.

"Digital natives" are not all technical savvy as we assume them to be. They might be heavy users of new technologies for entertainment and socialization but rarely experts when used in education (Yuen, Song & Jong, 2008). Therefore, scaffold technical training or practices are essential (Ramanau & Geng, 2009) as it might affect both students and instructors motivation and enthusiasm in utilizing the wiki. This is even more crucial with graduate courses since usually these courses consist of mixed age students. For example, for the course that was used in this study, it consists of six "digital immigrants" and five "digital natives". One student express that his or her educational needs were not met, that wiki does not promote a desire to learn and did not feel the spirit of community within the wiki while two students felt isolated at one time or the other while interacting in the wiki. It seemed like there is one particular student who does not seem to fit into this wiki learning community. Further investigation shows that this student falls into the category of "digital natives", as what Prensky (2001) calls them. It is indeed risky to assume that digital natives are guaranteed big fans of new technologies as what has been stated by Prensky (2001). Some notable research works have been found to dispel this notion among Australian and Malaysian students (see Kennedy et al., 2007; Yuen, Song, & Jong, 2008). Perhaps a scaffold tutorial on the wiki environment and how it works could orientate and prepare the students to utilize the wiki more effectively.

It is important to note that a strong sense of community was seen within the wiki with students comfortably interacting with each other. This is imperative for any successful computer mediated community to persist and for authentic building of knowledge to occur. The findings in this study concurred with another empirical research that points out the ability of computer mediated communication to promote more reflection on the course content, foster in-depth and higher order cognitive processing, and generate more active and social participation among the students (Hara et al., 2000). With vigilant and systematic planning, the wiki could drive a paradigm shift in the so called "impractical" constructive approach into reality.

Limitations

We acknowledge the small group sample within this research limited the findings and results. Further studies will be conducted within a bigger group of participants to substantiate these findings and results.

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