

Extending Learning to Interacting with Multiple Participants in Multiple Web 2.0 Learning Communities

Eugenia M. W. Ng

The Hong Kong Institute of Education, Hong Kong, China

eugenia@ied.edu.hk

Abstract

This study discusses a new attempt of introducing different Web 2.0 environments for our final year student teachers for them to experience with different features and to interact with different groups of participants. Three different learning communities were formed so that students could extend learning outside of classrooms. The within class learning communities enabled student teachers to experience different features of MOODLE platform and to learn from their peers. The second learning community involved graduates who gave comments to student teachers' solution of case studies in Google Sites. The third learning communities involved students of another program who gave comments to each other's virtual presentations. The different online activities provided evidences to examine if the dynamic and multimedia features of Web 2.0 can provide a useful environment to enhance learning for our student teachers. Data are analyzed from their postings, tracked statistics provided by the learning platforms and their opinions on the questionnaire. It was found that our student teachers were able to construct knowledge together by actively participating in various online activities. Indeed, they gave the highest rating to "sharing videos with another class" and second highest rating to "sharing our viewpoints of the case study with graduates had added value to my learning" on the questionnaire items. The findings imply that Web 2.0 environments facilitated interacting with different groups of participants and have resulted in enhanced learning.

Keywords: student teachers, learning communities, virtual presentation, Web 2.0 environments

Introduction

Information technology (IT), especially the Internet, has made a significant impact on learning and teaching. Teachers are no longer the major sources of information as there are plenty of resources available in the Internet which could be assessed at any time and at any place. In particular,

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the different online discussion forums have extended the one-to-many relationship from posting and reading materials from the Internet to many-to-many relationship that each member of the discussion forums can learn and contribute to different discussion topics.

The recent Web 2.0 environments further expand the many-to-many relationship from person-to-person via text exchanges to multiple formats sharing and

exchanges. As such Web 2.0 environments provide huge and untapped resources for learning and teaching worldwide.

Although many people are actively involved in various Web 2.0 communities informally and many researchers fervently believe that they provide invaluable research opportunities, yet there are only a handful of researchers who have actually conducted small-scale research in this area (McLoughlin & Lee, 2007) whilst some mainly discussed the planning and implementation strategies rather than the research results. For example, Virkus (2008) discussed the experiences on using Web 2.0 as one of the tools for graduate students, and Williams & Chinn (2009) examined whether business students' technology literacy level can be enhanced by using Web 2.0 tools. Therefore, the author attempted to conduct an empirical research to examine if the dynamic and multimedia features of Web 2.0 could provide a useful environment to enhance learning for our student teachers who have grown up with technology, enjoy performing multiple and varied activities simultaneously and prefer graphics to text (Prensky, 2001), in particular, to have dialogue exchanges with another class and with graduates. The following section will describe the pertinent literature review relate to different learning communities which were designed under different learning theories. It will be followed by a discussion of the learning activities that took place and the findings of the study. Finally, conclusion of the research and future directions will also be addressed.

Literature Review

Learning Communities

There are variations of using the term learning communities, such as knowledge community (Stacey, 1999), community of inquiry (Garrison, Anderson, & Archer, 2003) and virtual community (Herring, 2004). Members of the communities exchange information, help each other to develop skills and expertise and solve problems in an innovative way (Pan & Leidner, 2003). They developed a community identity around shared knowledge, common approaches and established practices and also created a shared directory of common resources. There are a number of learning communities in education and non-educational settings.

The first and the best practice of using information technology to foster collaborative learning is Computer-Supported Intentional Learning Environments which was developed by Marlene Scardamalia and Carl Bereiter at the Ontario Institute for Studies in Education. During the 1993-94 school year, CSILE was used for collaborative problem solving in mathematics, as an on-line literature circle, and as a vehicle for collaborative work in social studies. Successful learners used a variety of learning strategies to plan, integrate new knowledge with existing knowledge to achieve explicit learning goals (Scardamalia, Bereiter, McLearn, Swallow, & Woodruff, 1989). The participating teachers also attended an introductory training session where they also had the opportunity to meet other CSILE teachers across the country. They reported that the linkage across classrooms provided a broader range of perspectives and information for students to consider.

Anchored instruction means asking students to solve a fictitious problem with a realistic context. The exemplary case is the Jasper Woodbury series which is developed by Cognition and Technology Group at Vanderbilt (CTGV). The fictitious situation is presented in video format. Students are encouraged to tackle mathematical problems with geometry and other mathematical knowledge. For example, students are required to help to save an eagle in one episode of the series. The CTGV project also developed Special Multimedia Arenas for Refining Thinking (SMART) which extended classroom learning to a learning community of 100 students (Barron, et al., 1995). Students in the learning community called in to give answers to the problems after

the programs had been broadcasted on a local television station. The fictitious problems could be solved by learners both individually or collectively.

Cognitive apprenticeship emphasizes the importance of experts who coach and model cognitive activities. Teachers and students took turn to play the roles of another party so that they could understand both sides of teaching and learning (Brown, 1994). In the first lesson, the teacher or visual expert introduced a topic and stressed how various topics could be interrelated to form a jigsaw. Students spent the rest of their time doing research and teaching each other. In addition to face-to-face interactions, students used e-mails to communicate with each other and also to a wider community. "Meaning is negotiated and renegotiated as members of the community develop and share expertise" (Brown, 1994, p. 200). At the end of the tenth week, each group of students became an expert in a fifth of the topic materials and students developed a sense of responsibility and respected each other for their expertise.

The community of teachers (CoT) is one of the few communities for preservice teachers at Indiana University (Barab & Duffy, 2000). Each preservice teacher was paired with teachers at the school that she/he was assigned to. The teacher at school functioned as a mentor who negotiated and guided the student teacher. Apart from learning from the mentor, each of them had to join a community of practice whilst having a university faculty member as a facilitator. They met once a week and took turns to discuss readings, expectations whilst working at their schools. They also communicated with each other using e-mail. The pre-service teachers became mentors when they graduate and the learning community reproduces itself.

Brook and Lock (2010) presented a model of professional learning that incorporated blended learning, reflective practice, performance management processes, authentic experiences and tertiary learning to encourage change in classroom settings for practicing teachers. Teachers engaged in a professional development program viewed the video recordings of other participants and were also required to collaboratively analysis of the practices. Academics acted as facilitators of the learning experience by providing appropriate coaching and scaffolding. Reflective practice was facilitated through an analysis of actual classroom practice articulated through the common symbol system. Teachers found that a blended learning setting connected between theory with practice and collaborative learning provided a strong learning experience that translated to change in classroom practices. In particular, the use of video recording of their classroom teaching was seen by the participants as a powerful tool in reflecting on their own teaching.

Web 2.0

The concept of "Web 2.0" was coined by O'Reilly in 2004. Web 2.0 is broadly defined as a second generation, or more personalized communicative form of the World Wide Web that emphasizes active participation. These new concepts have led to the development and evolution of many web-based communities and hosted services, such as weblogs (blogs), wikis, podcasts, Really Simple Syndication (RSS), and social networking sites (O'Reilly, 2005). People communicate not only confine to words but also images, videos and multimedia. Users of Web 2.0 not only create and own data but also mix, amend and recombine content and are relatively more "open to the world", welcoming comments and revisions (McLoughlin & Lee, 2007). The boundaries between site creators and visitors are blurred (Oberhelman, 2007). Boyd (2007) claims that the sociability aspects of Web 2.0 have a great potential for enhancing education whilst Klamma et al. (2007) suggest that Web 2.0 concepts and technologies "have the potential to support life-long learning communities." Steel and Cheater (2008) suggest that the popularity of social networking tools enable students to connect and to collaborate in various ways. Similarly, Bryant (2007) suggests that Web 2.0 supports constructivist approaches to learning that provide great potential to socialize online learning. Thus, the Web 2.0 presents a new form of learning communities which enable participants to communicate using a variety of digital formats and communication methods.

The Study

Participants

The study was conducted at the Hong Kong Institute of Education (HKIEd) which is the sole teacher education institute in Hong Kong Special Administrative Region even though some universities have their education faculties. There were 13 undergraduate students (thereafter, MAIE students) who were enrolled into a four-year joint-program by the Hong Kong University of Science and Technology (HKUST) and a one-year professional teacher education provided by HKIEd. They learnt the subject discipline of both mathematics and information technology at HKUST but learnt education and teaching methods modules at HKIEd. The participants took the module entitled “Supporting Information Technology in Schools” which was taught by the author.

Tasks

Students were required to submit 3 types of assessments which included class participation, a group project and an individual report. The group project (25%) was to complete a small practical task which illustrates an innovative use of information technology in schools whilst the class participation (15%) grade consisted of online and face-to-face activities. A final report (60%) was on any critical issues related to the module content. Some studies indicated that teacher education did not adequately prepare teachers to teach with technology (Pope, Hare, & Howard, 2002; Selinger, 2001) and it is suggested that teacher education systems should integrate content, pedagogy and technology (Hughes, 2005; Koehler, Mishra, & Yahya, 2007). Bruner (1986) believed that learning was an active social process in which learners construct new ideas of concepts based on current knowledge. Therefore, a number of online activities were organized during the semester so that students could experience using IT to support learning and teaching. Student teachers were given the freedom to choose their own group members which could be three to four members per group. Eventually, four groups were formed and each group of students tackled the group project and a case study together. The following paragraphs will discuss the online activities using Web 2.0 environments.

The Learning Environment

MAIE students have already gained good experiences in using our designated learning platform, Blackboard, during their first few years of studies so it would be a good idea for them to have more exposure to different learning platforms prior to graduation. MOODLE (<http://www.moodle.org>) is an open source learning platform with Web 2.0 functionalities which was used as the learning platform for the module delivery together with other Web 2.0 environments to widen their horizons. There are a number of new technological functions such as glossary, Wiki and open-ended assessments which are not provided by Blackboard but which are included in MOODLE.

Within class community

Students joined a number of online activities with students of the same class during the module delivery to experience different features of MOODLE and to learn from each other. For example, they were asked to search and post information from the Internet about information technology education and post the information in the designated discussion forum. Figure 1 showed that there were a number of replies to peer’s posting (please note that the students’ real names have been removed from the screen shots to safe guard their privacy). Students were encouraged to use “rate” features to rate the posting of their peers. The “rate” is one of the popular Web 2.0 features which encourage active participation. In another activity, each group of students were asked to

find information related to the five year information technology strategic plan in Hong Kong and posted on Wiki. Figure 2 depicted the powerful functions of Wiki which enabled users to edit, link and view the history of Wiki. However, we found that Wiki provided by MOODLE in the Windows server environment did not allow concurrent editing by users.




Discussion	Started by	Replies
Ching Ching		14
JoE		5
肥威		4
Ching Ching		7

Figure 1: Within class community

[View](#) [Edit](#) [Links](#) [History](#)

History for: '五年策略檢討'

Version: 3 ([Browse](#) [Fetch-back](#) [Diff](#))

Author: 

Created: Friday, 9 January 2009, 03:01 PM

Last modification: Friday, 9 January 2009, 03:14 PM

Figure 2: History of using Wiki for discussion

Community with graduates

Constructivist learning emphasizes personal growth rather than attaining externally imposed achievements. As it is important to anchor with learner's prior knowledge with new knowledge learning (Barron, et al., 1995), the MAIE students were involved with an analytical study of fictitious schools. After attending the lectures, four groups of students tackled the pertinent tasks for their assigned schools which had different characteristics. Google sites (see Figure 3) were chosen as the avenue for students to submit the solution as it was simple to operate and easier to invite and include interested parties to participate. The box in Figure 3 shows the heading of different tasks which were created by the educator. The basic information of the fictitious school appears in bullet point one. The second bullet point is the heading for analyzing the environment of the school. The third bullet point showed the heading of an information technology development plan for the school. The fourth bullet point showed the heading of design a staff development plan and the fifth bullet point was organizing an activity about information security for schools whilst the sixth point was to design a disaster recovery planning process. Bullet point 7 gave the hyperlink of a mindmap which helped students to brainstorm the roles of different personnel in an IT team and their responsibilities whilst bullet point 8 was a hyperlink to other fictitious schools.

Students posted their solutions for different topics by hyperlinking to the pertinent headings and the project lasted for 5 weeks. Some people regarded academics as working in an ivory tower and

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were “disconnected” with the school settings. Therefore, two graduates were invited to give opinions on this project which they had tackled when they took the module with the author. The graduates were able to give realistic comments and suggestions to our students to improve their analysis (please see Findings and Discussion Section for details). Apart from the normal tracking, viewing and editing features, Google sites also enabled the creator of the site to subscribe to the changes so that all the updates were sent via e-mails (see Figure 4).

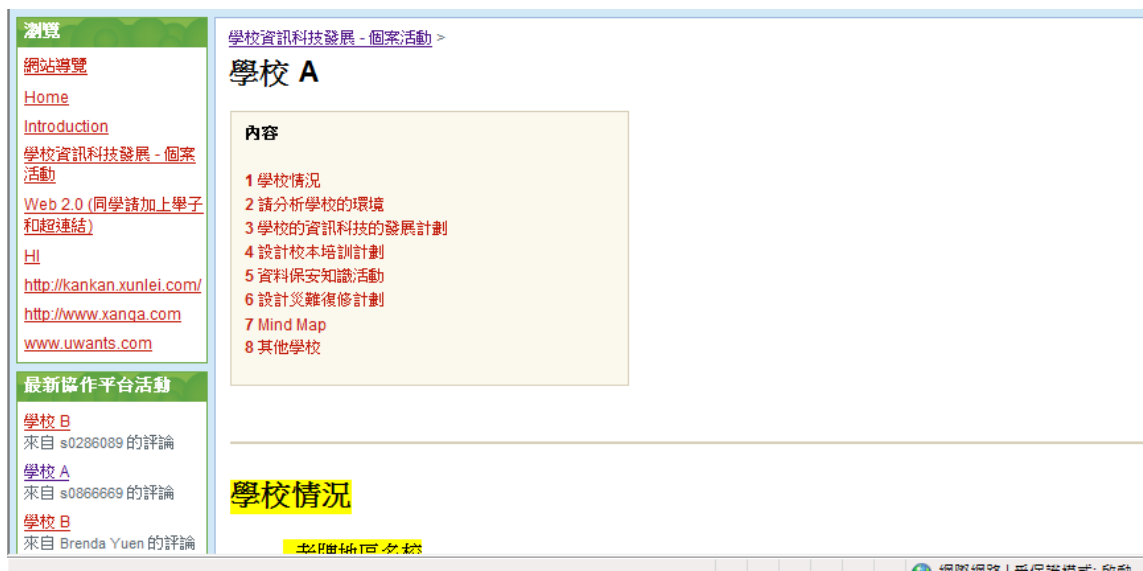


Figure 3: Using Wiki to tackle group project

<input type="checkbox"/> ☆	maie2008s2 (2)	[maie2008s2] 已更新 學校 D - s0668089 已更新頁面學校D。在下方檢視變更	27 Feb
<input type="checkbox"/> ☆	maie2008s2 (3)	[maie2008s2] 已更新 學校 C - s0668088 已更新頁面學校C。在下方檢視變更	27 Feb
<input type="checkbox"/> ☆	maie2008s2 (5)	[maie2008s2] 已更新 學校 A - s0668093 已更新頁面學校A。在下方檢視變更	27 Feb
<input type="checkbox"/> ☆	maie2008s2 (3)	[maie2008s2] 已更新 學校 B - s0668094 已更新頁面學校B。在下方檢視變更	27 Feb

Figure 4: Subscriptions of changes

Inter-class community

Five postgraduate diplomas in education (PGDE) students participated in the inter-class activity. It is a common practice for student teachers to give a presentation prior to submission of their assignments. As two groups of participants were potential information technology teachers in schools, they were expected to be adept and proficient in creating a virtual presentation by using video or self-running slide show. Students were required to express the core essence of their assignments using video or other digital formats such as a PowerPoint slides embedded with voice narration before uploading the presentation materials to the standard learning platform, Blackboard. This would enable them to receive feedback from peers in their own and another class, and also from educators of the two modules. The MAIE students were required to present their final individual essay, whereas the PGDE students' virtual presentations were on their group projects. Figure 5 shows the heading of the topics of the assignments. The topics included the problems of playing of indecent information in the Internet, problems of online games, copyright problems and school intranet. It was suggested that student teachers should give constructive comments on at least two of their peers' projects to foster collaborative intra and inter class learning. It was hoped that the formative assessments would enable students to improve in their final assignments.

3/12/09 7:29 PM	學校資訊科技政策(家長方面) Desmond	12
3/13/09 10:33 AM	網上淫褻及不雅物品	36
3/13/09 3:57 PM	網上遊戲問題 - JoE	11
3/13/09 5:15 PM	校園網頁---Peterson	6
3/13/09 10:09 PM	Copy right---Kevin Wong	16
3/13/09 10:32 PM	Chan Kai Ming, Tom (發展學生共通能力)	7
3/13/09 11:11 PM	Winson 校園電視台	4
3/13/09 11:13 PM	校園網頁--by David	8
3/16/09 12:08 AM	PGDE(S)FT - Helen, Brenda, Sam	5
3/17/09 1:19 AM	資訊科技--青少年問題	8
3/19/09 10:26 AM	網絡互動平台 Fat Wai	9
3/20/09 11:54 PM	PGDE(S) - Eric, Nathaniel	6

Figure 5: Screen shots of Inter-class community

Findings and Discussion

Tracking Functions

Within class community

Seven discussion forums were created during the module delivery. Figure 6 showed some examples of the discussion forum such as IT in education in Hong Kong and IT pilot schools in Hong Kong. The number of views varied from 53 to 703 and the average view was 243. However, we were mindful that number of views did not guarantee in-depth reading by the participants. Furthermore, some of the views had been inflated because of the author's checking on them whilst composing this article. Nevertheless, given that there were only 13 students, the average view's figure had been very impressive.

Activity	Views	Last access
 News forum	85	Monday, 22 June 2009, 03:20 PM (168 days 2 hours)
 香港資訊科技教育	703	Monday, 7 December 2009, 02:27 PM (3 hours 11 mins)
 資訊科技先導學校資料	365	Monday, 7 December 2009, 02:22 PM (3 hours 17 mins)
 五年策略檢討	53	Monday, 7 December 2009, 02:30 PM (3 hours 8 mins)
 資訊科技學習第二階段 - 措施及實施	381	Tuesday, 9 June 2009, 04:23 PM (181 days 1 hour)

Figure 6: Records of different discussion forums

Figure 7 shows that a student found some information about IT in education in Hong Kong and different objectives were listed in the posting. Other students used a variety of methods to give their comments to her (Figure 8). The first one used English which should be self-explanatory as the web site was created back in 1997 even though the objectives of the implementation were fairly recent. The second student wrote in Chinese, appeared to be asking about the question posted by the first student telling him that the author has already stated the objectives of imple-

menting IT in education in HK whilst the third one used emoticons to express his view on the posting. The tracking functions certainly indicated that the sociability aspects of Web 2.0 can enhance education (Boyd, 2007). However, it is noted that they were unwilling to rate their peers even though such convenient method is included in the Web 2.0 environment.

Ching Ching
by - Thursday, 8 January 2009, 02:05 PM

(五) 推動資訊科技教育的目標

短期目標 (2002年)	中期目標 (2007年)	長期目標 (2012年)
1.為學校增添電腦供學生使用 • 中學 每10人一部電腦, 1000人就有100部 • 小學 每20人一部電腦, 1000人就有50部	每5人一部電腦, 1000人就有200部 每10人一部電腦1000人就有100部	每2人一部電腦, 1000人就有500部 每5人一部電腦, 1000人就有200部
2.提供電腦設施供教師教學用 • 中小學都設置: 電腦投影機, 手提電腦	電腦投影機, 手提電腦及提供互聯網	足夠的設施配合新科技的發展

Figure 7: Examples a posting

The screenshot shows three sequential comments in a forum thread:

- Comment 1:** A smiley face icon, followed by "Re: Ching Ching" and "by - Thursday, 8 January 2009, 02:09 PM". The text reads: "That's a good post, thank you for the information. But it is an old date information (1997) What's the result now? Does it fulfill it's short term aim?". Below the text are links for "Show parent | Edit | Split | Delete | Reply" and a "Rate..." dropdown menu.
- Comment 2:** A smiley face icon, followed by "Re: Ching Ching" and "by - Thursday, 8 January 2009, 02:10 PM". The text reads: "這不是目標嗎?". Below the text are links for "Show parent | Edit | Split | Delete | Reply" and a "Rate..." dropdown menu.
- Comment 3:** A smiley face icon, followed by "Re: Ching Ching" and "by - Thursday, 8 January 2009, 02:10 PM". Below the text are ten small smiley face icons and links for "Show parent | Edit | Split | Delete | Reply" and a "Rate..." dropdown menu.

Figure 8: Examples of peer's comments to the posting of Figure 7

Inter-class community

Table 2 showed the statistics of postings for each class on their virtual presentations. The data showed that students were more active in providing feedback to peers of their own class rather than participants of another class. In particular, PGDE students were specifically reluctant to comment on the work of MAIE students. The number of postings by MAIE students was much higher as they had to submit individual presentations, rather than a group presentation, as required of the PGDE students. Furthermore, there were a lot more MAIE students (13) than PGDE students (5).

Table 2: The number of messages post by participants.

Group	No. of total postings	Threads by MAIE students	Threads by PGDE students
MAIE	109	102 (93.58%)	7 (6.42%)
PGDE	5	3 (60%)	2 (40%)
Academic	30	28 (93.33%)	2 (6.67%)
Total	144	133	11

Questionnaire Findings

MAIE students were asked to fill in a questionnaire related to different learning activities towards the end of the semester. The measurement instrument was developed using a five-point Likert-type scale where “1” stands for “Strongly Disagree”, “2” stands for “Disagree”, “3” stands for “Neutral”, “4” stands for “Agree” and “5” stands for “Strongly Agree”. There were eleven valid returns and the results were shown in Table 3. It was encouraging to know that students appreciated the opportunity for sharing their virtual presentations with another class (question 6) and they also preferred to present their ideas using video production than traditional in-class presentation (question 7). They felt that the viewpoints of the graduates had added value to learning (question 4) and the Wiki Project allowed them to gain more perspectives than only face-to-face approach (question 5) as they were able to see the proposed solutions from other groups and obtained feedback from the academic, peers and graduates.

Apart from the preferences of face-to-face communication (question 2), the respondents had positive ratings on all other online activities which suggested that the Web 2.0 environments supported them to construct knowledge with other groups of participants. The positive ratings were also consistent for all the items asked for the whole questionnaire return. It was obvious that they preferred blended learning than purely face-to-face and online activities (question 1). Nevertheless, they felt more comfortable communicating with their teachers and classmates face-to-face (question 2) rather than online which also explained that they did not have much dialogue exchanges with graduates and students of another class.

Table 3: Questionnaire results in descending order

Question	Mean	S.D.
Q6. Sharing videos with another class enabled me to gain more perspectives?	3.82	0.60
Q4. Sharing our viewpoints of the case study with graduates had added value to my learning	3.73	0.47
Q2. I feel more comfortable communicating with my teachers and classmates face-to-face rather online	3.55	1.13
Q5. The Wiki Project allowed me to gain more perspectives than only face-to-face approach	3.45	1.04
Q 7. I prefer to present my ideas using video production than traditional in-class presentation	3.45	1.37
Q3. Having online activities with students of the other class had added value to my learning	3.36	0.81
Q1. Blended learning enables me to learn more effectively than using only face-to-face approach	3.18	0.98

Conclusions and Future Directions

This article discussed a new attempt of adopting various Web 2.0 environments for our final year student teachers to experience with various dynamic and multimedia features of Web 2.0 with different groups of participants. The tracking functions provided concrete evidences that they were able to connect and to collaborate in a variety of online activities with different parties in different learning environments. The participants were also very receptive and competent in using different Web 2.0 networks. The student teachers gave high regards on the activities with graduates and students of another class which showed that they were “open to the world”, welcoming comments and revisions (McLoughlin & Lee, 2007). The findings indicated that they developed a sense of responsibility and respected each other for their expertise. They also tried innovative ways to express their comments which could be an indication of support and yet they were still shy in rating their peers. Therefore, Web 2.0 could provide a useful environment to enhance learning for our student teachers who had grown up with technology and preferred graphics to text (Prensky, 2001).

Like many other researchers (McLoughlin & Lee, 2007), this article presented a small-scale research in this area. It is thus dangerous to generalize the findings. There are different approaches to having an in depth understanding of the value of Web 2.0 for enhancing learning. Firstly, we can conduct content analysis on the postings to determine the presence of certain words or concepts within texts or sets of texts to measure the collaborative skills of students. Secondly, focus group meetings could be held to get in depth-understanding of the behaviors of the participants

especially on the rationale of not using the “rate” functions. Thirdly, it is unclear of the value of the sociability aspects of Web 2.0 as we did not adopt any popular social networking environments in the module delivery, so we could include the social aspect in future research. Fourthly, conducting longitudinal research to evaluate the longer-term effect of Web 2.0 in enhancing learning. Lastly, the results would be more convincing if there are controlled group of students and the number of participants can be increased to generate quantitative data which are more statistically significant. Perhaps researchers from different countries can cooperative and conduct larger scale research together.

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Biography



Eugenia M. W. Ng is an Associate Professor in the Mathematics and Information Technology Department and Associate Dean of Graduate School of the Hong Kong Institute of Education. She has been a research investigator of various internal and external funded projects. She has had over seventy articles published in conference proceedings, journals, newspapers and as book chapters. Her publications have appeared in *Issues in Informing Science and Information Technology*, *Journal of Interactive Instruction Development*, *Information Systems Education*, *Journal of Quality School Education* and *Annals of Cases on Information Technology*. Her book chapters have appeared in *Subject Teaching and Teacher Education in the New Century: Research and Innovation*, and *Improving student learning: Learning-oriented assessment in action*, *Encyclopaedia of Information Technology Curriculum Integration*, *Encyclopaedia of Information Communications and Technology* and *Encyclopaedia of Networked and Virtual Organizations*. She is the editor of *Comparative blended learning practices and environments*, Co-editor-in-Chief of *International Journal of Web-based Learning and Teaching Technologies*, a member of the editorial board of *Annals of Cases on Information Technology*, and reviewers for *Journal of Computers in Human Behavior*.