Investigating Collaborative Reflection with Peers in an Online Learning Environment

Qiyun Wang, National Institute of Education, Singapore, qiyun.wang@nie.edu.sg
Choon Lang Quek, National Institute of Education, Singapore, choonlang.quek@nie.edu.sg

Abstract: In this study, a group of 22 vocational school teachers wrote weekly reflections in an online learning environment after attending a lesson. They also read the reflections written by others and gave comments. The purpose of this study was to find out how they reflected collaboratively in the online learning environment and what they learned from the collaborative reflection process. Results show that they could reflect on the lesson content and link it to their teaching practice. Also, their peers could get additional perspectives, negotiate meaning, and learn how to reflect better from the reflection shared. Furthermore, they could also gain additional knowledge and emotional support from their peers' comments. This paper describes the design of the study, and the themes that emerged from the reflection, comments, and responses. Benefits of writing collaborative reflection with peers in an online learning environment and issues involved in the study are discussed.

Keywords: collaborative reflection; Edmodo; individual reflection; online reflection; teacher education; technology

Introduction

Being able to reflect on what they have learned from a training session and further apply it to teaching practice is an essential competency for school teachers in the current information age, as it enables them to examine the relevance of the training content and improve their teaching practice to meet the constant change of students' learning needs (Killeavy & Moloney, 2010). Reflection can be written in different ways such as individually or collaboratively. Individual reflection may enhance the development of insight, heighten cognitive awareness, promote critical thinking, and engender personal transformation. However, recent proponents of reflection have challenged the assumption that reflection occurs solely in isolation (Morris & Stew, 2007), and suggest that reflection should be a collaborative critical thinking process, in which participants can 'attain intersubjective understanding and build knowledge together' (Yukawa, 2006, p.207).

Collaborative reflection can also be carried out in different settings such as online or face-to-face, and with different people like the teacher or peers. Some existing research studies have examined how learners collaboratively reflect with the teacher in face-to-face settings (e.g. Morris & Stew, 2007) or in online settings (e.g. Yakawa, 2006). Other studied have investigated how learners reflect or discuss with their peers in online spaces (e.g. Killervy & Monoley, 2010; Yang, 2009). However, these studies usually focus on the affordances of the online tools (such as a weblog or a discussion forum) for collaborative sharing and discussion. Very little literature reports on how learners reflect collaboratively with their peers and what they learn from each other in an online environment.

The purpose of this study was to investigate how a group of vocational school teachers reflected in an online learning environment after attending training lessons, and how their peers commented on the reflection and what the peers learned from the reflection. Furthermore, this study also examined how they responded to the comments received from the peers and what they gained from the comments. This paper describes the research design of the study, and the themes emerged from the reflection, comments, and responses.

Collaborative reflection

Compared to individual reflection, collaborative reflection is a step further. In addition to making the connection between the new content with their existing knowledge, learners also share their individual understanding and get feedback from others, as shown in Figure 1. Much literature also argues that individual reflection may obstruct professional development and it should involve external dialogue with others such as the teacher or peers (Clarke, 2003; Hawkes & Romiszowski, 2001).

Many existing research studies report on collaborative reflection between learners and the teacher (Wang & Woo, 2010; Yukawa, 2006). The advantage of collaboration with the teacher is that learners can get expertise and support from the teacher, but learners may not disagree with the teacher's opinions or examine his/her comments critically, owing to the perceived expertise of the teacher or the imbalanced power

relationship (Bye, Smith, & Rallis, 2009; Leijen et al, 2009). Also, the quality of the teacher may heavily affect the level of collaborative reflection (Morris & Stew, 2007).

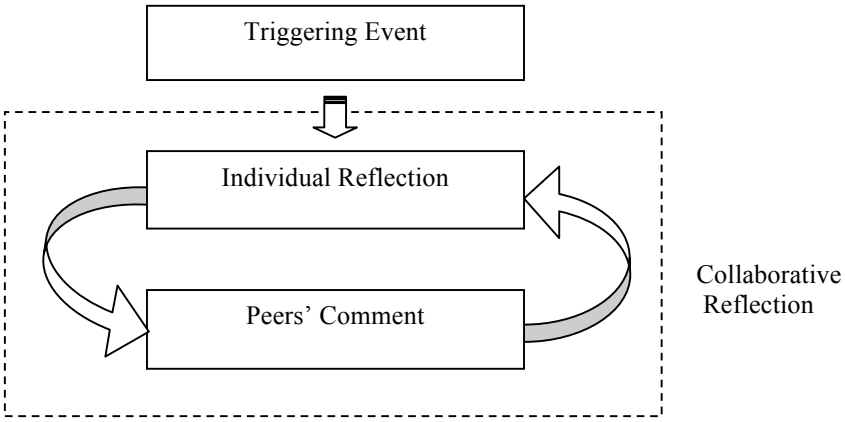

Figure 1. Illustration of collaborative reflection

Comparatively, collaborative reflection between learners and peers is more of a reciprocal process. By reading through published reflection, peers would have the possibility to get valuable alternative perspectives from their shared reflection (Leijen et al, 2009; van Gyn, 1996). Also, they may gain additional insights from the peers' comments. Through the interaction and communication, learners and their peers can achieve mutual understanding and build knowledge together (Yukawa, 2006).

No matter collaborative reflection occurs with the teacher or peers, an often reported benefit is the release of learners' stress and the expression of their emotions. Research shows learners often reflect on the aspects which they did wrong, but ignore positive aspects (Leijen, et al, 2009). Through collaborative sharing and reflection, they can find out that they are not alone in their feelings (Glazer, Abbott, & Harris, 2004). They may also get emotional support from the feedback received (Nicholson & Bond, 2003; Yakawa, 2006).

Many existing studies examine collaborative reflection in face-to-face settings, such as those done by Glazer, Abbott and Harris (2004), and Morris and Stew (2007). Collaborative reflection in face-to-face settings has many benefits such as enabling participants to clarify ideas or get feedback immediately. However, participants are often hard to find time to meet together (Glazer, Abbott, & Harris, 2004), and reflection minutes are not automatically recorded (Wang, 2010). On the other hand, the fast growth of technology has made writing reflection in an online learning environment not only feasible, but also more effective than in a face-to-face setting (Wang & Woo, 2010).

Learning is a highly social process according to the social constructivist learning theory. As learners' individual understanding on the same topic may be different, having an opportunity to share and negotiate their understanding with peers would enable them to get various perspectives from others and hence understand the topic better. In this study, collaborative reflection is defined as a reciprocal critical thinking process of learners, who share their understanding in an online learning environment after attending a lesson, give comments to the reflection written by peers, and respond to the comments received, so that they can reach mutual understanding and construct meaningful knowledge together.

Methods

Participants and course description

A total number of 22 (14 females, 8 males) vocational school teachers from China participated in this study, when they were studying as full-time Master students at National Institute of Education in Singapore for a year, majored in the subject of educational management. Their age ranged from 25 to 49. They had different backgrounds. Half of them were vice principals or deans, and the others were subject teachers. About one-third had more than 15 years of teaching experience, and the rest had an average of 7 years. Their teaching subjects included English language, computers, sports, nurse education and others. Their technology competency varied according to their subjects and ages.

The course entitled Educational Technology and Issues in Management ran three hours a week and lasted for six weeks. The lessons involved both theories and hands-on activities. The theories included affordances of web 2.0 tools, design and evaluation of web-based courses, and technology supported

professional development. The hands-on activities provided them with opportunities to explore simple ICT tools such as Blackboard and Lesson Builder.

One of the course assignments was to write weekly collaborative reflection in the first five weeks. Each reflection was supposed to include what they had learned in the lesson and how to apply it into practice. The participants were required to share their individual reflection in Edmodo (http://www.Edmodo.com) with their peers. Also, they must view and give comments to at least two reflection posts written by others. Each reflection was 10 marks, of which their individual reflection and comments had five marks respectively.

To ensure the collaborative reflection process to occur smoothly, some ground rules were established in the first session. By each weekend, they had to complete their individual reflection and submit to Edmodo. Between the weekend and the next session, they had to give at least two comments to the reflection posts written by others.

Research questions, data collection and analysis

The assumption of writing collaborative reflection in this course was to get the participants gaining knowledge not only from the instructor, but also from their peers. The purpose of this study was to investigate how they collaboratively reflected with each other and if they learned something useful from their peers and what they learned. The main research questions were:

- How did they reflect collaboratively?
- What did they learn from the collective reflection process?

Following the traditional grounded theory (Strauss & Corbin, 1990), this study adopted the constant comparison approach. All reflection posts, comments and responses posted onto Edmodo were copied to a word document. The reflection of the first participant was read carefully in paragraphs, and the way of writing reflection was color coded for easy recognition later. After analyzing all reflection posts of the first participant, the researcher compiled the codes to further consolidate common themes.

The coding process continued in a similar way with the rest of the participants. If a new theme emerged, it would be added to the theme list. After reading through all reflection posts, common themes emerged from the reflection were generated. The themes were further compared and combined. A list of two to four themes was finally summarized. The same approach was applied to analyze the comments and responses. The following section reports on the common themes identified in the reflection, comments, and responses.

Findings

Reflection

Altogether 110 individual reflection posts were found in Edmodo and 184 codes were labeled. As shown in Table 1, three main themes emerged from the reflection, which were: i) elaborating on the content; ii) applying the content into practice; and iii) changing beliefs.

Table 1: Themes emerged from the reflection

Theme		How/What	N	%
Elaborating on content	-	Reiterating/summarizing what they learned	49	26.6
	-	adding new information	31	16.8
	-	linking to existing content	9	5.0
			89	**48.4**
Applying the content into practice	-	explaining existing phenomena	58	31.5
	-	solving real problems	26	14.1
			84	**45.6**
Changing beliefs	-	rethinking about their beliefs	9	5.0
	-	transforming their beliefs	2	1.0
			11	**6.0**
		Total	**184**	**100**

Elaborating on the content

Reflecting on the lesson content was a basic requirement for the individual reflection. The participants elaborated on the content in slightly different ways. The most often used way was that they simply repeated what they had learned from the lesson, summarized some points from the instructor's presentation, or added certain personal understanding but without in-depth explanations (N = 49, 26.6%).

Another way was that they elaborated on the content further by adding new information (N = 31, 16.8%). It was evident that they went to the Internet to search for additional information for better understanding the contents that were new to them. In their reflection, they shared the additional information. For instance, a participant wrote in his reflection:

> Today what impressed me most was the constructivist learning theory. Previously I knew little about it. After the class, I went to the Internet to look for the definitions of constructivism. Some of the definitions are… (Lin Botao)

An additional way of writing reflection was they elaborated on the content by connecting it to previous lessons, reflection, or content learned from other instructors (N=9, 5.0%). It seemed that they attempted to integrate the newly learned content into their existing knowledge structure.

Applying the content into practice

Two ways of applying the newly learned content into practice was found. One way was that they attempted to explain certain existing phenomena by using the content (N=58, 31.5%). For instance, one strategy to promote constructivist learning is to make the learning task meaningful to learners. A participant linked this strategy to her experience of learning an English word. She said:

> I still remember how I learned the word of 'smother' many years ago. The teacher told that in order to remember its meaning, we could imagine that a mother was careless and her child was finally 'smothered'. I think this is the power of making leaning tasks meaningful (Zhang zhen)

The other way was that they applied the lesson content into real world problem solving (N=26, 14.1%). After studying how to design web-based courses, a participant came up with an idea of designing a web-based course, in which a learning activity was to establish a supermarket in Singapore. He wrote:

> Through the activity of establishing a supermarket in Singapore, students can learn practical knowledge about laws, geographical information, economics, and goods information. By doing this activity, students can learn and construct knowledge by themselves. Designing this course will be more useful than teaching them directly (Shao Feng)

Changing beliefs

Another theme emerged from the reflection was the newly learned content stimulated them to rethink about their underlying beliefs and as a result their assumptions started to transform (N=11, 6.0%). For instance, before the lesson about using the weblog for teaching and learning, some of them thought that the weblog was a tool for writing personal diaries or sharing information with friends only. They seldom thought that it could be used as a teaching or learning tool. After seeing some examples, they realized the potential of the weblog for learning and thereafter their opinions started to change.

Another example was that a participant started to believe that using technology was not that difficult after exploring some simple technological tools in this course. In her reflection, she wrote:

> I seldom thought of using technologies to enhance my teaching before because I felt it was quite troublesome and there might be a lot of technical problems. In the past few sessions, we explored a few simple but quite useful tools such as weblog and Edmodo. I feel using technology is not that difficult and effectively using it would enable students to learner better. I will try to use technology more frequently in the future (Zhu yuhong)

Comments

Altogether 326 comments were posted to Edmodo and 336 codes were identified. As shown in Table 2, four major themes became apparent in their comments, which were: i) commenting on the content; ii) expressing encouragement; iii) commenting on the way of writing reflection; and iv) bantering with peers.

Table 2: Themes emerged from the comments

Theme	How/What	N	%
Commenting on the content	- elaborating on the reflection	134	39.9
	- articulating agreement	92	27.4
	- negotiating meaning	24	7.1
	- articulating disagreement	14	4.1
	- learning new content directly or indirectly	13	3.9
		277	**82.4**
Expressing encouragement	- encouraging or being encouraged	27	8.0
Commenting on the way of writing reflection	- respecting the positive attitude towards reflection/learning	17	5.0
Bantering with peers	- sharing jokes	9	2.7
	- using nicknames	6	1.9
		15	**4.6**
	Total	**336**	**100**

Commenting on the content

Peers used to further elaborate on the reflection content in their comments (N=134, 39.9%). Slightly different ways of making comments were found. One way was that they picked up certain keywords or points from the reflection and elaborated further by adding new information or explanations. Another way was they attempted to offer solutions to some problems mentioned in the reflection or to explain why the problems existed.

Peers also expressed opinions in their comments. They might add personal experiences or additional arguments to support the opinions embedded in the reflection (N=92, 27.4%), or disagreed with certain ideas in the reflection by providing with different examples or perspectives (N=14, 4.1%). The following comment shows how a participant disagreed:

> I think you are too optimistic about constructivist learning with vocational school students. I feel it is a bit hard for the students to construct knowledge as their learning abilities are rather low. They even don't know what to learn, needleless to say how to construct (Liu Ruiyan)

In certain cases where the reflection content was unclear, peers tended to negotiate meaning by asking questions, giving a different interpretation, or asking for more information (N=24, 7.1%). For example, a participant mentioned in her reflection that constructivist learning might not be feasible for low-ability students. She thought teachers had to consider students' abilities when they were designing lessons and to provide different learning activities to different ability students. After this reflection, a peer in his comment wrote:

> I think what you mean is 'yin-cai-shi-jiao' (a Chinese idiom, which means teaching according to the student's ability). My view is different and may be incorrect. It is exactly because various students can construct, they have rich knowledge. We should allow different-ability students to construct knowledge, and the initial knowledge constructed can be wrong. They can learn from errors. What do you think? Waiting for your critique (Wang Shu)

In some comments, peers also stated what they learned from the reflection (N=13, 3.9%). They indicated that they either learned directly from the published reflection, or benefited from the reflection in an indirect way as certain ideas in the reflection triggered them to search for more information or study further.

Expressing encouragement

In addition to giving comments to the content, peers also expressed encouragement in their comments (N=27, 8.0%). Generally, peers gave encouragement in two situations. One was that peers gave encouragement when they realized the reflection writer had certain problems or difficulties, and the other way was that they gave positive comments or encouragement when the reflection writer presented good ideas, comprehensive summaries, or constructive suggestions. The following two quotations show how a peer encouraged the reflection writer and how another peer was encouraged respectively:

> From your worries I deeply feel how much you love your profession, your students, and our home country. The conditions in our country are lower but improving very fast. We should believe our school facilities will become better in the future… (Xiong Ying)

Commenting on the way of writing reflection

Sometimes they did not comment on the reflection content, but on the way of writing reflection (N=17, 5.0%). What impressed them most was the responsible way of writing reflection, or the positive attitude towards reflection writing or learning in general. The following quotation shows how a peer commented on the way of writing reflection:

> This is a very detailed and in-depth reflection. I did not link the content to practical problems and my reflection stayed at a surface level. After reading your reflection, I understand what is 'xue-er-bu-si-ze-ming'(learning without thinking is useless) (Xiang Guohong)

Bantering with peers

One way of bantering was they joked with each other (N=9, 2.7%). For instance, after reading a reflection post about how easy to communicate with others at a distance by using instant messaging tools or email, a peer wrote in her comment that:

> Cheng cheng, if I want to talk to Qing-shi-huang (an ancient Chinese emperor lived more than 2000 years ago), which tool should I use, instant messaging, mobile phone, or email? I am waiting for your reply (Xiong Ying)

Another way was that they occasionally addressed others by nicknames (N=6, 1.9%). A participant who has a word of 'Xiang' (which is the elephant in Chinese) in his name, his peers often called him 'a big elephant'. It seems that he was acceptable with this form of address and no indication showed that he was unhappy with it. Another participant was often labeled 'xian zhi' (which means a prophet) in her peers' posts.

Responses

This section describes how the participants responded to the comments received and what they gained from the comments. Although the assignment did not require the participants to respond to the comments received, many of them did spontaneously. Altogether 30 responses were found and each response was associated with a code. As shown in Table 3, two main themes arose from the responses, which were: i) responding to the comment content; and ii) responding to the emotional support received.

Table 3: Themes emerged from responses

Theme	How/What	N	%
Responding to the comment content	- providing further explanations	12	40.0
	- acknowledging the contribution of comments: extending the breadth or depth of reflection	8	26.7
		20	**66.7**
Responding to emotional support	- felt encouraged or not alone	10	33.3
	Total	**30**	**100**

Responding to the comment content

Many responses were to answer the questions asked in the comments or to provide additional information to further explain their opinions (N=12, 40.0%). For instance in a reflection post, Mrs. Wu indicated that she created some animations when she was teaching a course and found the students learned better by using the animations. However, she pointed out that creating animations was complicated and time consuming. In the following comments, she was suggested asking students to create. If so, students would learn the topic better and she could also collect good artifacts for future use. In the response, she argued that she did ask students to create but failed, and further explained why it did not work.

Some responses were to acknowledge the contribution of comments (N=8, 26.7%). It seemed that the comments made two major contributions: One was that the comments extended the breadth of their original reflection. They thought the comments made the reflection content more complete, as they provided additional perspectives or explanations. The other contribution was that the comments extended the depth of their reflection, as these comments explained why certain phenomena happened or how to address the problems/issues involved in the reflection. Such comments enabled them to understand the problems better or promoted their understanding to a higher level.

Responding to emotional support

The participants sometimes got emotional support from the comments received and felt encouraged (N=10, 33.3%). For instance in a reflection post, Ms. Tan became quite depressed after comparing the use of technology in Singapore schools and in her own school in China. She described some of the problems she encountered in her prior teaching practice. In a comment, she was comforted that the school facilities had been better than before, and the school condition in China would be catching up. After receiving the comment, she replied that:

> Thanks for your comfort and encouragement. I also hope the school condition would become better, the gap will be narrowed down, and the use of technology in schools will be improved faster in the future (Tan Jingyun)

Discussion

Collaborative reflection has additional benefits than individual reflection. In addition to learning content directly from the lesson or the instructor, the participants in this study also shared their understanding with peers. Through the sharing, peers learned additional information, different perspectives, or the way of writing from the reflection. Also, the comments given by peers extended the breadth or depth of their original understanding. Obviously without sharing and interacting with others, these benefits would be hard to gain. This finding confirms the outcomes of other studies done by Yukawa (2006), Morris and Stew (2007), and Yang (2009), who claim that collaborative reflection is a reciprocal critical thinking process, in which learners can gain knowledge from each other, and develop professional knowledge together.

Collaborative reflection can also lead to higher level thinking and transformational changes. In addition to reflecting and commenting on the lesson content, the participants in this study also reflected on the way of others' writing reflection, which is closely related to what Mezirow (1991) called process reflection. This study also showed that through collaborative reflection, participants demonstrated certain changes in their beliefs. Belief change is associated with premise reflection (Mezirow, 1991). In addition, the result further extends the finding of Killeavy and Moloney (2010), who found that learners merely involved content reflection, not process or premise reflection in their weblog-based reflection.

Collaborative reflection involves both cognitive and affective processes. In this study, the participants did not only reflect on content, but also gave encouragement or emotional support to others. The participants appreciated the support and felt encouraged. This study supports the notion that collaborative reflection is an integrated process, in which affective interactions help to build and maintain positive relationships among participants and hence promote their cognitive development (Nicholson & Bond, 2003; Yukawa, 2006).

Some benefits of collaborative reflection are associated with the online medium only. Online reflection provides a more equal opportunity for a group of participants to share and discuss ideas. Comparatively, the face-to-face discussion is often controlled by a few vocal participants and therefore the conclusion may be biased (Wang & Woo, 2007). Online reflection can extend their sharing beyond the classroom. The discussion in the classroom may not reach a consensus due to the time limitation. The online reflection can become another venue for them to continue their sharing and discussion (Nicholson & Bond, 2003; Slavit, 2002).

Online reflection makes the communication process more transparent. As all communication minutes are recorded down automatically, participants can easily refer back to the previous posts. This would enable them to easily make connections between what they have just learned and what obtained before (Wang, 2010;

Yukawa, 2006). Undoubtedly, without these affordances of an online tool such as Edmodo, the results of this study might be compromised.

This study has some implications for collaborative reflection to take place effectively. A few learners are preferably more experienced in terms of teaching experiences or critical thinking skills, so that they can act as positive role models to others. In this study, some participants were more experienced or responsible. Their reflection was in more depth. The others commonly indicated that they learned how to reflect from these learners. This finding suggests that involving some higher ability or more experienced learners would show a positive sample to others and hence has the possibility to promote collaborative reflection to a higher level.

Another implication is that learners are favored to have different backgrounds. In this study, the participants varied in their ages, positions, teaching subjects, or teaching experiences. Because of the difference, they could explain the same content or phenomenon from different perspectives, or give varied interpretations. This result implies that having different background learners would increase the likelihood of gaining more benefits from peers in the collaborative reflection process.

Writing collaborative reflection with peers in an online learning environment has a number of benefits. Learners can share their understanding with their peers in the online learning environment. Also, peers can learn different perspectives or positive attitude towards learning from the reflection they shared. Their peers also have enough time to think about the reflection, and provide additional perspectives or encouragement, from which they can gain emotional support or extra information to further extend their original understanding. This study confirms that collaborative reflection with peers is a reciprocal learning process for learners to support and learn from each other and construct knowledge together.

References

Bye, L., Smith, S., Rallis, H. (2009). Reflection using an online discussion forum: Impact on student learning and satisfaction. *Social Work Education, 28*(8), 841-855.

Clarke, M. (2003). *Reflections: Journals and reflective questions a strategy for professional* learning, NZARE/AARE Conference. New Zealand.

Glazer, C., Abbott, L., & Harris, J. (2004). A teacher-developed process for collaborative professional reflection. *Reflective Practice, 5*(3), pp. 33-46.

Hawkes, M., & Romiszowski, A. (2001). Examining the reflective outcomes of asynchronous computer-mediated communication on inservice teacher development. *Journal of Technology and Teacher Education, 9*(2), 283-306.

Killeavy, M., & Moloney, A. (2010). Reflection in a social space: Can blogging support reflective practice for beginning teachers? *Teaching and Teacher Education, 26*(4), 1070-1076.

Leijen, Ä., Lam, I., Wildschut., L., & Simons, R. (2009). Difficulties teachers report about studnets' reflection: Lessons learned from dance education. *Teaching in Higher Education, 14*(3), 315-326.

Mezirow, J. (1991). Transformative dimensions of adult learning. San Francisco: Jossey-Bass.

Morris,L., & Stew, G. (2007). Collaborative reflection: How far do 2:1 models of learning in the practice setting promote peer reflection? *Reflective Practice, 8*(3), 419-432.

Nicholson, S., & Bond, N. (2003). Collaborative reflection and professional community building: An analysis of preservice teachers' use of an electronic discussion board. *Journal of Technology and Teacher Education, 11*(2), 259-279.

Slavit, D. (2002). Expanding classroom discussion with an online medium. *Journal of Technology and Teacher Education, 10*(3), 407-422.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Van Gyn, G. (1996). Reflective practice: the needs of professions and the promise of cooperative education. *Journal of Cooperative Education, 31*(2), 103-131.

Wang, Q.Y. (2010). Using shared online workspaces to support group collaborative learning. *Computers & Education, 55*(3), 1270-1276.

Wang, Q.Y., & Woo, H.L. (2010). Investigating students' critical thinking in weblogs: An exploratory study in a Singapore secondary school. *Asia Pacific Education Review, 11*(4), 541-551.

Wang, Q.Y., & Woo, H.L (2007). Comparing asynchronous online discussions and face-to-face discussions in a classroom setting. *British Journal of Educational Technology, 38* (2), 272-286.

Yang, S.H. (2009). Using blogs to enhance critical reflection and community of practice. *Educational Technology & Society, 12*(2), 11-21.

Yukawa, J. (2006). Co-reflection in online learning: Collaborative critical thinking as narrative. International *Journal of Computer-Supported Collaborative learning, 1*(2), 203-228.