

*A case study of constructivist instructional strategies for adult online learning*¹

Shieh Ruey

Address for correspondence: Dr. Ruey Shieh, Department of Information Management, Tatung Institute of Commerce and Technology, 253 Mi-Tuo Road, Chiayi City 600, Taiwan, ROC. Email: rueys99@gmail.com

Abstract

This case study explores how a constructivist-based instructional design helped adult learners learn in an online learning environment. Two classes of adult learners pursuing professional development and registered in a web-based course were studied. The data consisted of course documents, submitted artefacts, surveys, interviews, in-class observations, and online observations. The study found that the majority of the learners were engaged in two facets of learning. On the one hand, the instructional activities requiring collaboration and interaction helped the learners support one another's learning, from which most claimed to have benefited. On the other hand, the constructivist-based course assisted many learners to develop a sense of becoming more responsible, self-directed learners. Overall, the social constructivist style of instructional strategy seems promising to facilitate adult learning, which not only helps change learners' perceptions of the online learning, but also assists them to learn in a more collaborative, authentic and responsible way. The study, however, also disclosed that in order to maintain high-quality learning, appropriate assessment plans and adequate facilitation must be particularly reinforced. A facilitation model is thus suggested.

Introduction

With the rising prevalence of the Internet, technological media for teaching and learning are becoming increasingly interactive, widely distributed and collaborative (Bonk, Hara, Dennen, Malikowski & Supplee, 2000; Chang, 2003). A collaborative, interactive, constructivist online learning environment, as opposed to a passive learning environment, is found to be better able to help students learn more actively and effectively (Murphy, Mahoney, Chen, Mendoza-Diaz & Yang, 2005). Online learning provides learners, especially adult learners, with an opportunity and flexibility for learning at

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any time and in any place. As lifelong learning is considered both an economic and a social and individual interest (White, 2007), how to assist general adult learners to learn more practically and persistently through the online learning environment is of great interest. The purpose of this study is to explore whether and how nondegree-pursuing adult learners benefit from engaging in a constructivist-based online course. This study first briefly reviews the notion of constructivist learning, and then the characteristics of adult learners and adult learning, followed by discussing online instructional strategies designed based on constructivist principles. Two online courses offered for adult learners are investigated to address the research questions. In addition to reporting the findings, a facilitation model for improving the constructivist-based online course geared towards adult learners is also provided at the end.

The concept of constructivist learning

Constructivist learning arose from Piagetian and Vygotskian perspectives (Palincsar, 1998), emphasising the impact of constructed knowledge on the individual's active, reflective thinking. While Piaget focused more on individual cognitive constructivism, Vygotsky stressed that sociocultural systems have a major impact on an individual's learning (Siegler, 1998). According to social constructivist theory, knowledge is socially situated and is constructed through reflection on one's own thoughts and experiences, as well as other learners' ideas. Dewey (1938) believed that individual development is dependent upon the existing social environmental context and argued that students should learn from the genuine world through continuous interaction with others. Lave and Wenger (1991) asserted that learning is socially situated with members' active participation in their routine, patterned activities. A constructivist, dialogical instructional approach should focus on learning about 'why' and learning about 'how', rather than conducting learning itself (Scott, 2001). In the constructivist learning environment, students are encouraged to actively engage in learning: to discuss, argue, negotiate ideas, and to collaboratively solve problems; teachers design and provide the learning context and facilitate learning activities (Palincsar). Because of their rich life and employment experience, the social, situated nature of learning through practices appears particularly authentic and appropriate for adult learners.

Adult learners and adult learning

The success of adult learning greatly depends upon individuals' maturation and experiences (Mezirow, 1991, 1997; Wang, Sierra & Folger, 2003) contended that the focus of adult learning is on assisting them to become independent thinkers, rather than passive knowledge receivers. However, like younger students, adult learners also need motivation to sustain their learning, particularly those less engaged working adults (Priest, 2000). To achieve this, the course curriculum must be tailored to individual adult's learning needs, interests, abilities and experiences (Lindeman, 1926). Learners may learn more effectively when instructional activities are designed in accordance with their personal needs, characteristics and, most importantly, their life context (Knowles, 1990). Knowles (1986) proposed the concept of *contract learning* as the fundamental platform for organising individual adult learning. The idea of contract learning hinges on individual learners planning their own learning based on their

learning needs, prior experiences, interests, goals and self-competence. The progress of the learning contract is based upon the learners' successfully comprehending what they have learned so far (Scott, 2001). When learners set up their own learning objectives and learning outcomes through the learning contract process, they will better understand their learning style and will have better access to the desired course content (Boyer, 2003).

Instructional strategies for facilitating constructivist online learning

To implement a constructivist-based online course, various instructional strategies have been implemented, such as requiring students to engage in collaborative, contextualised learning by simulating and assuming an authentic role that is real in the authentic society (Auyeung, 2004; Maor, 2003; Martens, Bastiaens & Kirschner, 2007); setting a collective goal and a shared vision to motivate students' participation and contribution levels (Gilbert & Driscoll, 2002); and requiring students to be in charge of a discussion of their teamwork (Harmon & Jones, 2000). Some online facilitators required students to plan their own learning goals, set their learning pace, and develop the methodology to achieve the set goals (Boyer, 2003; Kochtanek & Hein, 2000). While learners are expected to assume more responsibility for their learning, the role of online facilitators is crucial (Kochtanek & Hein). A number of online educators suggest that the facilitation tasks include providing feedback to learners and a summary of or specific comments on the discussed issues at the end of class discussions (eg, Graham, Cagiltay, Lim, Craner & Duffy, 2001; Maor), and intervening and promoting students' participation in the discussion when it becomes stagnant (eg, Auyeung, 2004; Maor). Encouraging students to provide timely responses and feedback to class members helps boost the students' sense of participation and learning in online learning communities (Gilbert & Driscoll, 2002; Hill, Raven & Han, 2002; Wegerif, 1998), which further helps boost students' achievement (Moller, Harvey, Downs & Godshalk, 2000). Some online facilitators reinforced students' interaction and engagement by laying out clear assessment specifications and setting aside a high percentage of the grade to the class-level online discussion activity (Maor).

To facilitate online discussion activities, Murphy *et al* (2005) proposed a constructivist model, which involves three levels of facilitation: (1) the instructor's mentoring (guiding the learners to develop cognitive and metacognitive skills), (2) teaching assistants' (TA) coaching (monitoring learners in developing task management skills), and (3) learner facilitators' moderation (facilitating required learning activities). Salmon (2002) proposed a five-stage model to facilitate online teaching and learning, in which varied facilitation skills and instructional activities are recommended in different learning stages. The five stages are: (1) access and motivation (setting up the system, welcoming and encouraging), (2) socialisation (establishing cultural, social learning environments), (3) information exchange (facilitating, supporting use of course materials), (4) knowledge construction (conferencing, moderating process), and (5) development (helping achieve personal goals) stages. When designing social constructivist pedagogy for adult learners, Huang (2002) suggested that six instructional principles be considered: interactive learning (interacting with the instructor and peers, rather

than engaging in isolated learning), collaborative learning (engaging in collaborative knowledge construction, social negotiation, and reflection), facilitating learning (providing a safe, positive learning environment for sharing ideas and thoughts), authentic learning (connecting learning content to real-life experiences), student-centred learning (emphasising self-directed, experiential learning), and high-quality learning (stressing critical thinking skills and learners' reflection on their own lives).

Although various instructional strategies, principles and models have been suggested to facilitate online learning, implementing a constructivist-based online course is not without its challenges. For example, the constructivist type of online learning is still new to most learners, and learners may have trouble adjusting to the course, including taking responsibility for their own learning and keeping pace with the overwhelming amount of statements generated online (Harmon & Jones, 2000; Kochtanek & Hein, 2000). Moreover, it is difficult to predict how learners will perceive the designed activities, and whether the activities will motivate them, and learners may experience much less authenticity than the course designers assume (Martens *et al.*, 2007). Less desirable, Conrad (2008) found that learners seldom demonstrate the benefits they acquire from participating in online learning activities in their workplace. Whether and how a constructivist online course helps adult learners learn more authentically and meaningfully from a holistic perspective deserves to be further examined. The purpose of this study is to explore in what way and how adult learners benefit from a constructivist-based online learning environment. More specifically this study intends to address the following two research questions:

1. What and how do online adult learners benefit from a constructivist-based online course?
2. What improvements are identified that will help strengthen the constructivist-based course in the future?

Methodology

Research context

The examined course was offered by the Department of Adult Education at a National University in Taiwan. The 18-week graduate-level course was entitled Lifelong Learning and Educational Innovation, and was delivered through the online platform developed by the university. The technological features of the platform include announcements, course information, course materials, discussion forum, chat room, user manuals, self-evaluation forms and personal tools. As a result of passing the course, learners would earn a certificate equivalent to two graduate-level credits. Two classes of adult learners who registered in the course in the spring and fall of 2006 were studied.

The facilitator offering the course had five-years teaching experience in higher education, and it was his fourth year of teaching the current course. He deliberately designed the course to be embedded with constructivist instructional principles, and five learning activities were included:

1. Face-to-face meetings held in the beginning (for distributing the course handouts), the middle (for learners to present the midterm group project), and the end (for learners to present the final report) of the semester.
2. Posting of weekly reports on the course discussion forum for peers to review and exchange thoughts and ideas.
3. Three synchronous online sessions held through the chat room.
4. Designing and completing a midterm group project.
5. A final report.

It is noted that in order to enhance learner-centred learning, the format of the weekly report activity was purposefully modified in the fall semester of 2006. Learners enrolled in the fall class were required to take turns being in charge of the weekly report activity by selecting a report topic, eliciting peers' thoughts and responses, and moderating discussions among peers throughout the week. Moreover, in order to enhance the TA's role in the course, the task of facilitating the synchronous online sessions was shifted from the facilitator to the TA in the fall semester.

Data collection and analysis

Seven sources of data were collected, consisting of:

1. Survey—conducted at the end of the semester to gather the learners' demographic information. All learners were invited to fill out the survey voluntarily and confidentially. Those who provided contact information would be further contacted for sharing their learning experiences via a later individual interview.
2. Course documents—including objectives, instructional activities, assessment plans and course content.
3. Artefacts submitted by learners—including weekly reports, online discourse statements and individual as well as group projects.
4. Face-to-face interviews with the instructor at the beginning and the end of the semesters.
5. Individual phone interviews with 21 learners, 10 in the spring semester and 11 in the fall, using a semistructured question list to attain the learner's learning experiences and reflections.
6. Casual conversations with the learners during the break time of the face-to-face meetings.
7. Class observations of all online learning activities.

Patton's (2002) theoretical stance of social constructivism guided the qualitative inquiries. The study employed the content analysis approach to analyse the data. Data were coded and analysed using the three types of codes suggested by Miles and Huberman (1994), ie, descriptive, interpretive and pattern. Although this study only investigated two online classes, the rich qualitative data attained from both classes, nonetheless, help shed valuable light on the learning experiences of the studied subjects. It is hoped that the findings reported in this study will provide useful insights for online educators and facilitators with the aim of designing and implementing more effective strategies to facilitate adult learning in the online learning environment.

Findings

There were 17 learners enrolled in the spring semester of 2006 and 15 in the fall semester. Fourteen of the spring learners (82%) and 10 of the fall learners (67%) were K-12 teachers. The majority of the learners were female. Twelve spring learners (71%) and 13 fall learners (87%) returned the survey. The survey data showed that all but one were first-time online learners. All worked full-time. More detailed demographic information is listed in Table 1. Table 1 reveals that gender, occupation, marital status and computer skills of the two classes of learners are rather similar. However, there appears to be differences in terms of age, personality, study habits and study hours per week. For example, the learners in the fall semester were younger and tended to spend less time on the course than those in the spring semester (less than 4 hours per week vs. 5–10 hours).

In the interviews, the instructor mentioned that the main goal of teaching the course was to help the learners gain knowledge and concepts of lifelong learning and educational innovation to enrich both their personal and professional lives. Because all the

Table 1: Demographic information of the learners

Items	Categories	Spring 2006 (n = 17)*	Fall 2006 (n = 15)*
Occupation	K-12 teacher	14	10
	Other	3	5
Gender	Female	13	9
	Male	4	6
		(n = 12)†	(n = 13)†
First online course	Yes	12	12
	No	0	1
Self-assessed computer skills	Poor	1	1
	Average	8	9
	Good	2	2
	Proficient	0	1
Study hours per week	Less than 4 hours	4	7
	5–10 hours	8	4
	11–15 hours	0	0
	>15 if needed	0	2
Employment status	Full-time	12	13
	Part-time	0	0
Age	20–29	1	1
	30–39	5	10
	40–49	6	2
Marital status	Married	9	10
	Single	3	3

*Total number of learners in the class.

†Total number of learners returning the survey.

learners registered in the course had a full-time job, sustaining them in the course appeared to be a big challenge. In order to retain them, the instructor said that a friendly, encouraging, sharing learning atmosphere was important. The instructor also mentioned that he would be flexible and set lenient policies, such as accepting late assignments, to fit the learners' needs. He also emphasised that meaningful learning only takes place when learners have a positive, active mindset. Helping online adult learners learn more pleasantly and persistently was his major instructional goal. How the learners reacted to the online course is described later.

Interactive and collaborative learning

Most of the learners interviewed reported that being involved in interactive learning activities in a web-based learning environment was a new experience for them, especially in responding to others' weekly reports online and participating in synchronous online discussions. To some learners, and particularly the older learners, being exposed to high-technology learning was an experience beyond their routine life. The majority, however, showed very positive attitudes towards the new learning approach. Almost all spring learners appreciated the opportunity to interact with peers simultaneously in the synchronous online sessions. They regarded being able to 'talk' with classmates and receive instant responses in an impromptu fashion as an exciting experience. However, the process of the activity also imposed pressure on them. Some learners reported that they had to act 'fast, both in typing and thinking' in order to keep up with the flow of discourse. Lacking sufficient technological skills was reportedly the main cause holding several learners back from actively taking part in the activity. A number of spring learners commented that the continuously emerging statements and diverse topics prevented any subject from being discussed 'in depth'.

The fall learners did not seem to be as excited about participating in the synchronous online sessions as the spring learners and there were also fewer fall learners *attending* the sessions. Those who participated in the online sessions reported that the discussion contents were not focused. Several suggested that it would have helped them learn more effectively should summarised statements or 'authoritative conclusions' be provided at the end of the discussion. Some researchers have cautioned that learners may perceive an instructor and a TA differently and respond differently to their involvement (Nickel, 2002; Seo, 2007). The fall learners, nevertheless, appeared more active in engaging in the weekly report activity. Quite a few learners, including those acknowledging that they were not as involved in the activity, said in the interview that they felt regarded and encouraged when receiving responses from others. Several, however, mentioned that, compared with face-to-face communication, interacting with peers online was rather time-consuming. The face-to-face meeting was also reported to have enhanced the feeling of familiarity with peers, particularly with their own group members when communicating online. Different from the concept of blended learning addressed by Heinze, Procter and Scott (2007), in which the learner could take advantage of either face-to-face meetings or online discussions to engage in problem solving and model

building, the face-to-face meetings conducted in the current study appeared only to have served the purpose of reducing the learners' isolated feeling of taking the online course.

The learners' responses to the group project were also diverse between the two classes of learners. The majority of spring learners valued the opportunity to collaboratively accomplish a team project with group members. Two of the learners, Students 106 and 107, both aged 40–49, considered that the group project not only allowed the members to exchange thoughts and ideas, but also reinforced interaction among members. McGivney (2004) contended that a supportive learning group is necessary to sustain adult learning. Student 101, aged 30–39, nonetheless, expressed that group discussion sometimes was a waste of time in that the discussion often turned into chatting about personal matters. Unlike the spring learners, the fall learners did not seem to work closely to complete the group project. They reportedly used either emails or occasional phone calls to discuss the project, instead of getting all members together to brainstorm.

Self-directed learning

Many learners in both classes stated in the interview that they initially anticipated the current online course to be a self-study style with provision of packaged materials, but later realised that they were not only required to frequently interact with class members, but were also the ones managing their own learning needs, such as deciding on their own learning breadth and depth, engagement level, and the group project content and format. Some fall learners reported that being in charge of the weekly report activity promoted their sense of 'owning the right [control] of the lecture'. Some emphasised that the instructional style implemented in this online course changed their learning habits. For example, Student 210, a veteran teacher aged 30–39, depicted his change of mindset in the interview:

I think my biggest gain from taking the course is [the change in] my learning habits ... As the instructor [teaching the course] once said, students often find excuses for their laziness, such as being too busy to study. The instructional style I experienced in this course helped me realize that I must not rely on the instructor for the content knowledge ... I learned to find time to do more research on the topics I am interested in ... I feel that I have learned more about learning methods [study habits] than content knowledge from this online course. (Interview with Student 210, Feb. 2, 2007)

Pragmatic and supportive learning

Most learners in the spring class reported in the interview that they 'learned a lot from the rich course materials' and were satisfied with the course content. Examples regarding what they had learned from the course consisted of holding educational activities in their resident village as a result of the enriched knowledge and their gained confidence, holding seminars disseminating the concept of lifelong learning to school parents, improving communication skills with their school parents, and promoting family reading at home after realising that learning actually takes place in everyday life. The artefacts collected online also show that the majority of the learners were able to relate the concepts taught in the course to their daily-life practices.

Interestingly, the same course materials did not seem to have impressed most of the fall learners. Although many mentioned that they had learned new concepts from the materials, they commented that the course content appeared 'too theoretical' and the course materials lacked examples guiding them to apply theory to practice. Life experiences and work situations shared by peers in the class activities were asserted to have supplemented their learning needs. 'Learning by viewing others' ideas and thoughts' expressed in the peers' weekly reports and online discourse appeared to be the most common benefit from taking the course that both the spring and fall learners mentioned in the interview. They said that reading others' opinions and ideas often helped them view the same issue from different perspectives. Not only had the learners learned from each other's experiences, but the instructor also once mentioned in the interview that he himself was inspired by some learners' thoughts and sharing.

Quality of learning

Most of the learners did not seem to be concerned with the final grade. Quite a few learners emphasised that what mattered was what they had learned from the course. Nevertheless, several mentioned that the assessment policy implemented in the course was too vague and too lenient. Student 101, aged 30–39, stated that the course requirements did not seem to be very strict and she therefore only attempted to expend minimal effort to meet the basic requirements. Student 202, also aged 30–39, reported that she always pushed herself to be 'top' in her study, but felt that a loose assessment system did not seem to distinguish diligent students from less engaged students and thus might greatly affect the learner's learning emotion. Likewise, some other learners also acknowledged that they were less enthusiastic about participating in the required activities after realising that there were no negative consequences to their lack of participation.

Lack of feedback also appeared to have a negative impact on learning effort. Student 110 aged 30–39, mentioned in the interview that not being able to receive much feedback from others reduced her enthusiasm and engagement in working on the assignments. The feedback the instructor provided for the learners' assignments was reportedly mainly composed of short, encouraging statements, which, several learners mentioned, was not particularly helpful to their learning. Student 202 frankly admitted that she was somewhat disappointed about not having received more critical feedback. She said she was anticipating feedback that could better help her widen her viewpoint and improve her thinking skills. A few learners, however, reported that the easy course requirements and positive feedback helped reduce their anxiety and uncertainty while taking the online course, which was the reason they remained in the course. As a result, all learners registered in the two classes completed the course and earned a passing certificate.

Conclusions and discussion

Overall, a constructivist-based instructional approach seems promising to encourage adult learners to engage in more collaborative, authentic and responsible learning in an

online learning environment. The argument is supported through addressing the two research questions explored in this study as follows.

What and how do the online adult learners benefit from a constructivist-based course?

Acquiring new concepts from studying the course materials and obtaining different thoughts from reading peers' viewpoints and experiences posted online are some common gains reported by the learners. The knowledge attainment also appears to have helped a number of learners increase their confidence in dealing with their routine work tasks, and many were able to apply the learned concepts to their real-life practices. Some had further comprehended the notion hidden behind online study because of the self-disciplined instructional approach. Although most learners initially expected to engage in packaged, self-study online learning, rather than a collaborative, interactive style of learning, the 'anticipation gap' appeared to have allowed the learners to engage in two facets of learning experience. On the one hand, the instructional activities requiring collaboration and interaction helped the learners support each other's learning, from which most claimed to have benefited. On the other hand, the self-control type of learning allowed many learners to learn in a more independent, responsible way. The social, collaborative, constructivist style of instructional design implemented in the current course not only changed many learners' perceptions of the online course, but also helped them become more responsible, self-controlled learners. Such change may be particularly important to those who are currently K-12 teachers, the front-line educators of the new generation.

What improvements are identified that will help strengthen the constructivist-based course in the future?

Consistent with the earlier literature, this study found that the learners' learning expectations and satisfaction with the course activities were rather diverse and also unpredictable. While some regarded the course materials as being rich and helpful, others felt disappointed with them. Similarly, while the loose assessment plans eased some learners' pressure and helped sustain their study, the same plans frustrated others. It is, however, noticed that the older learners tended to be content with learning through acquiring new concepts and reading peers' opinions and ideas, while the younger learners seemed to be more eager to attain useful knowledge which would allow them to connect theory to practice. The older learners were also inclined to enjoy less demanding course requirements, whereas the younger learners appeared to have expected more specific course requirements and assessment policies. In order to accommodate such a variety of learning needs and expectations, more flexible instructional strategies are necessary.

Learners' perceptions of online courses are positively associated with their sense of directed facilitation on the part of the course instructor (Seo, 2007; Shea, Swan, Li & Pickett, 2005). In this study the instructor's role of providing learners with feedback and assessment plans, appears weak, which might partially account for some learners' lack of enthusiasm about making more effort throughout the course. Although the majority of the learners registered in the course were not concerned with their course

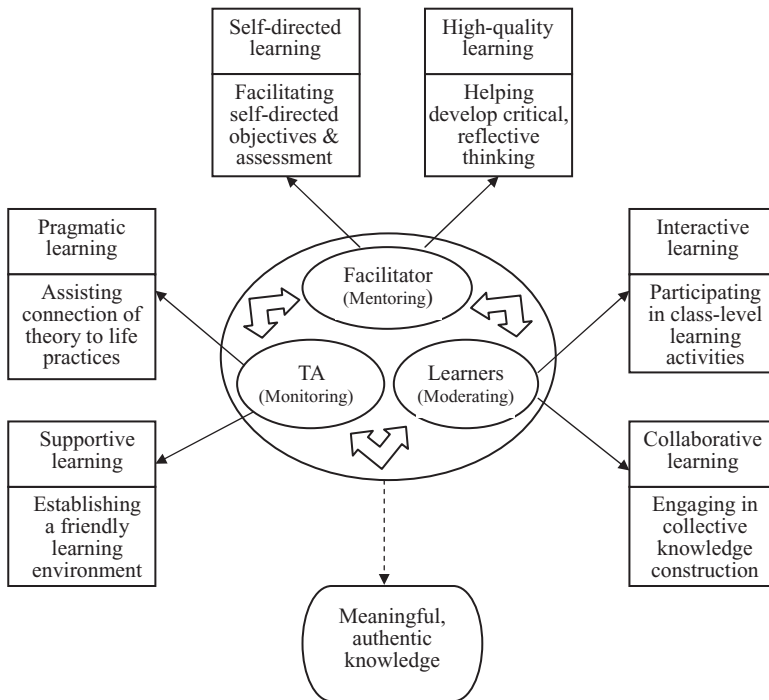


Figure 1: A model for facilitating constructivist-based adult online learning

grades, this does not mean that they did not expect to receive critical feedback on their performance. Receiving explanations and elaborated feedback is positively associated with student achievement (Webb, 1985). In addition to anticipating feedback from the instructor, most learners also expected to receive responses from peers. Priest (2000) contended that even though adult online learners are inclined towards self-directed learning, they also appreciate the exchange of thoughts and cordial relations with other members. In order to maintain high quality online learning, appropriate assessment plans and adequate facilitation must be emphasised.

Recommendations

Successful online learning depends upon attentive design and facilitation (Morrison & Guenther, 2000). A well-designed facilitation model not only helps promote active, participatory learning, but also reduces the online instructor's workload (Murphy *et al*, 2005). This study, based on the findings, proposes a facilitation model, which intends to provide clear role objectives and associated tasks for each of the involving parties in the learning community. Figure 1 displays the recommended facilitation model. In the figure the large circle indicates that facilitation plays a fundamental role in the learning process, which is composed of three parties of participants indicated in three small circles—the facilitator, the TA and the learners. The facilitator plays a *mentoring* role,

focusing on guiding learners' self-directed, high-quality learning. The TA plays a *monitoring* role, supporting learners to engage in pragmatic learning. The learners themselves play a *moderating* role, motivating peers to be involved in interactive, collaborative learning. These tasks are shown in rectangles in the figure.

The facilitator's mentoring role

Because of various characteristics of adult learners, an important role of the facilitator is to satisfy learners' diverse learning needs and learning anticipations. To this end, the adoption of a personalised learning tool, such as a learning contract as proposed by Knowles (1986), is recommended. In the contract, the learners are urged to conceive what their learning objectives are, how they will accomplish the desired objectives, and how they will assess the learning progress through self-examination and reflection. However, while helping individual learners develop a sense of responsibility for their own learning, the learning contract must also be constructed based on the notion of a learning community, such as engaging in a group-based project and participating in the class-level discussion forums required by the course. It is more appropriate to carry out a learning contract in a face-to-face orientation session rather than in the online site (Boyer, 2003; Palloff & Pratt, 1999). The first face-to-face meeting held in the first week of the current course appears to be an ideal time for the learners to initiate such a contract. Another important role of the facilitator is to ensure that the learners engage in critical reflection and higher-order thinking and also receive adequate feedback, particularly for the artefacts submitted individually, as the learning contract progresses. Timely, meaningful feedback is decisive to the instructional quality of the online course (Gaytan & McEwen, 2007). Assessment is the engine that motivates students to participate in learning activity (Heinze *et al.*, 2007; Swan, Shen & Hiltz, 2006); therefore regularly evaluating the learners' self-assessment plan is also necessary. In short, the facilitator plays a pivotal role in the facilitation process, as she or he not only helps learners articulate their learning desires and learning objectives at the beginning of the course, but also assists individual learners to achieve the attempted learning goals in a reflective fashion throughout the course.

The TA's monitoring role

While the facilitator focuses on individual learners' development, the TA's role involves facilitating the class activities; for instance, planning discussion topics for the synchronous online session in advance and providing a summary of the discussion statements at the end of the discussion. The TA must also monitor learners' engagement in focused discussions, and encourage them to connect theory learned in the course to their real-life practices. In a class full of mature, experienced adult learners, a TA may not be viewed as being as authoritative as the instructor. Galbraith (1992) stated that it is important that TAs present themselves in a way that suggests they have something to offer, and that learners can benefit from their knowledge, experience, skill and expertise. Another role of the TA is to maintain a positive, user-friendly learning environment for learners to freely share and reflect their thoughts, including providing timely technical assistance and discouraging inadequate statements. This will allow the learners to feel

comfortable with the learning environment and feel supported in the ensuing learning, which Salmon (2002) asserted is critical to their attendance in the course.

The learners' moderating role

The learners are the main characters in the learning activities and are expected to actively participate in the knowledge sharing and construction process. It appears that the pedagogical strategy requiring learners to take turns being in charge of the weekly report activity is useful for helping them gain a sense of ownership of their study and for reinforcing their feeling of the learning community. However, in order to provide learners with a better understanding of the quality of their work, a peer review mechanism is suggested. Peer review, which is one way of eliciting constructive feedback among learners, is considered not only to increase students' critical thinking skills, but also to promote a higher-level grading function for the instructor (Arend, 2006; Seo, 2007; Wolfe, 2004) found that, compared with nonpeer-moderated online discussions, peer-moderated discussions evoke considerably more meaningful interaction, including more posts responded by others and more substantive messages. The instructor in the study conducted by Murphy *et al* (2005) assigned voluntary participants as cofacilitators to help moderate the learners' participation. In the present course, it is also suggested that voluntary cofacilitators, particularly active class members, be arranged to help boost enthusiasm for class discussion. To alleviate the workload of occupied adult learners, a rotating review approach may be considered; for example, the learners rotate to provide feedback to a certain number of peers every other week. However, substantive feedback must be urged. The cofacilitators' role may thus consist of arranging the peer-review mechanism and catalysing learners' continual interaction and collaboration in class activities, especially when shy learners or less active learners are in charge of the weekly report activity.

Lifelong learning, as indicated in the title of the studied course, has increasingly become a common practice worldwide. This study proposes a model which aims to facilitate learning in a constructivist-based online learning environment. The proposed model intends to identify instructional strategies that fit various learning needs of adult learners and to distinguish tasks and roles played by the parties involved in the learning process. It is a model integrating some earlier works, such as instructional principles addressed by Huang (2002) and the facilitation model proposed by Murphy *et al* (2005). It is, however, noted that while Murphy *et al's* facilitation model suggested a hierarchical facilitation relationship between the instructor and TAs, between the instructor and learner facilitators, and between TAs and learner facilitators, a mutual learning relationship among the three parties (indicated by the bi-directional arrows among the parties in Figure 1) is suggested here, because learning does not seem to occur hierarchically. Dewey (1938) reminds us that the learning process is based upon an attitude of 'shared inquiry' in which the teacher is a partner in the collaborative relationship with the student. When all participants are included in the learning picture and also realise that everyone is equally important in the knowledge construction process, meaningful, authentic constructivist-based online learning could be more substantively achieved.

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