Learning From Eliciting Questions in Exploring Global Knowledge

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Abstract
Twenty first century learning is characterized as technology-supported, student-centered, collaborative, context-based, and globalized learning. Higher education emphasizing practices for incorporating learning experiences serves as a means to prepare students for professional development. Advances in information and communication technology are influencing the instructional formats and delivery modes of Library and Information Science professionals. Integrating ICT (information communication technology) literacy into classroom learning environment is essential. In order to prepare students to face the challenges of the global marketplace, encouraging students to explore world knowledge entails instructional planning to enhance learning engagement. An elective course "Exploration of the Library World" employed question eliciting strategy into a technology-facilitated learning environment. Self-generated questions by students were used to help them deeply process learning and explore contents. The process also develops students' critical thinking, self-awareness and analytical skills. Students' learning was facilitated through active participation in generating and sharing questions based on the course content. Various learning media were used, including video clips (produced for providing interactive scenarios) and web-based resources together with assigned tasks. In order to fulfill the course requirements, students needed to submit both individual and group assignments on a weekly basis. Students' self-generated questions were summarized and discussed in each class. Reflective learning practices from 40 college students were summarized. Most students stated that learning through eliciting questions helped them focus on reading and exploring the materials. At the end of the course, students' self-regulated dispositions and skill development were assessed through various aspects.

Keywords: Inquiry learning, reflective learning, collaborative learning, self-regulated learning

Introduction

Twenty first century learning is characterized as technology-supported, student-centered, collaborative, context-based, and globalized learning. Learners are required to possess the capability to manage rapid changes of world knowledge and information. A recent study shows that, as technology races ahead, within a decade or two, nearly half of American jobs could be taken by computers; only jobs that require both creative and social intelligence will be left (Frey & Osborne, 2013). This finding indicates that the transformation of the pedagogy paradigm from drilling factual knowledge to facilitating an innovation motivation environment is crucial. Higher education around the world emphasizes various practices for incorporating learning experiences to prepare students for professional development. Dewey (1933) believed that education begins with the curiosity of the learner. Along this line, recent researchers have found that non-cognitive skills, such as curiosity, problem solving, information inquiry, and self-regulated learning are highly correlated with academic outcomes (Rosen, et al., 2010). Encouraging students to explore world knowledge entails instructional planning to enhance learning engagement, empower learners by giving them greater autonomy over the use of information in the learning process, develop an appreciation in learners of the value of independent learning, and enable learners to become lifelong learners (Hsieh, Jang, Huang & Chen, 2011).

This study discusses how question eliciting strategy was implemented in an ICT facilitated learning environment for freshmen students majoring in Library and Information Science. The instructional approach aimed to develop students' critical thinking, self-awareness and analytical skills through inquiry-based activities. Students' learning was facilitated through active participation in online exploration, question generating and sharing. Multimedia was used in the class, including self-made video clips (for providing interactive scenarios), web-based resources, and instant response tools. Reflective journals inviting self-generated questions were used each week to help students deeply process and explore learning contents. The framework for integrating ICT into classroom activities was structured using mixed theoretical approaches: inquiry-based learning, the question eliciting approach and reflective learning.

Inquiry-based learning

In the past, learning resources were mainly print-based textbooks, the learning setting was teacher-centered, and additional resources were prepared by teachers and functioned as supplement materials "that act as a vehicle for delivering information to the learner" (Clark, 1983; Kong & So, 2008). As technology races ahead, knowledge no longer comes from one single channel. Rather, students can access a variety of authentic knowledge online. Inquiry-based learning is a student-centered, active learning approach focused on questioning, critical thinking, and problem solving. Inquiry-based learning engages learners in searching, comprehending, organizing, synthesizing and evaluating information from different resources. Learners actively understand problems, investigate information, and discuss solutions (Kong & So, 2008). Inquiry experiences can provide valuable opportunities for students to improve their understanding of both learning content and professional practices (Edelson, Gordon, & Pea, 1999). Inquiry-based learning is reinforced by effective peer interaction. This process encourages students to experience a genuine learning

community and a shift from passive knowledge acquisition to active utilization of knowledge (Morrison-saunders & Hobson, 2013). Different from traditional learning settings, this approach encourages collaboration among learners in an inquiry-based learning atmosphere. Knowledge is shared and constructed by the learners as its central focus. In contrast, quite often, the voice of learners is excluded in teacher-centered classrooms. Collaborative learning in the classroom setting empowers learners' voices, cultivates critical thinking, and enhances learning and achievement (Gerstein, 2013).

Question eliciting approach

Inquiry-based learning activities begin with raising questions followed by eliciting solutions, creating new knowledge as information is gathered and understood, discussing discoveries and experiences, and reflecting on new-found knowledge (Savery, 2006). Allowing students to generate their own investigative questions stimulates curiosity and encourages profound thinking about relationships among questions, tests, evidence and conclusions (Chin & Brown, 2010). However, Edelson, Gordin & Pea (1999) found that the implementation of inquiry-based learning in classrooms often brings about challenges related to students' motivational contexts, the selection and sequencing of activities, the design of investigation tools, and the creation of process supports. Skills in the art of questioning for essential to proper scaffolding. Chin & Brown (2010) stated that problem-solving activities elicit more and a wider range of good questions than teacher directed activities. Although students do not always ask good questions spontaneously, they are able to generate such questions when prompted to do so. In recent years, new mobile devise based instant response systems have been adopted in face-to-face classes. Tools, including Nearpod and Socrative formative assessment apps improve the attendance and engagement of students. Teachers can make in-class polls or questionnaires and check responses on site. Students can stimulate and probe deeper conceptual understanding and enhance pedagogical outcomes (Liu & Taylor, 2013; Caeiro-Rodriguez, Gonzalez-Tato, Llamas-Nistal, 2013).

Reflection for a self-regulative process

Self-regulated learning is viewed as personally directed forms of learning. Learners manage to self-select reading, or seek information (Zimmerman, 2008). However, learners need to be guided, given the choices regarding the academic tasks to pursue when carrying out complex assignments and learning strategies related to the self-regulative process (Zimmerman & Schunk, 2001).

To foster the self-regulative learning process, reflective journal writing encourages students to be more critical and reflective about their learning. Reflection has been recognized as being a metacognitive process that examines and explores constructed knowledge and experience (Boyd & Fales, 1983; Dewey, 1933). Journal writing serves as a vehicle for reflection before, during, and after a learning experience. Journals provide a venue for students to develop personally and professionally (Dyment & O'Connell, 2010). This approach provides a learning experience in which students record and reflect deeply on their thoughts and feelings on issues and events that are an essential part of their learning (Le & Le, 2007). Reflection is an active, persistent and careful consideration toward self-constructed knowledge and meaning

through using one's experience, action, and beliefs (Dewey,1933; Schon,1987). It is initiated through one's experience, thinking, consideration, and evaluation to examine and explore the concerned issues, opinions, feelings, and behaviors (Boyd & Fales, 1983; Carver & Scheier, 1998). It is also a learning process which helps learners express and evaluate their attitudes and feelings, expand their learning cognition; this process is intimately related to holistic comprehension (Hsieh, Jang, Huang & Chen, 2011).

The study

Subject and setting

This study was conducted at a university in northern Taiwan. Forty Library and Information Science freshmen enrolling in the elective course "Exploration of Library World" participated in this study. An 18 week first-year general world library introduction course has been developed based on inquiry based learning.

Implementation

The course led students to explore world libraries via online media. Students followed guided inquiry worksheets to develop and understand the course objectives. Groups of six students were formed and shuffled randomly every other week. The instructor moved among the groups, serving as a facilitator. Through collaborative learning techniques, students were active participants in the learning process. No lectures were given. Basic English communication skills of library professionals were practiced. Students were guided to write reflective journals based on a structured format as listed in Table 1. The reflective journals were framed based on: What did the students know? What did they want to know? How were these questions answered? What were their reflections? The class was held in a multimedia interactive studio; where WIFI, laptops, tablets, and a projector were available to students for accomplish assignments, e.g. inquiry learning, library conversation video creation and instant response gathering. The self-generated questions were summarized and discussed in each class. Students were asked to complete inquiry worksheets both individually and by group. Students' worksheets and reflective journals were collected at the end of class.

Data collection and analysis

In this study, both qualitative and quantitative data were collected. Qualitative data were collected from the semester-end summative questionnaire. The questionnaire items were organized in four categories, including: exploration of knowledge, collaborative learning activities, the use of the online instant response system, and reflective journal writing. Descriptive analysis was used in data analysis, as presented in Table 1 to Table 4. Qualitative data were retrieved from reflective journals from 40 college students written on a weekly basis. Detailed descriptions are shown in Table 5.

Findings

Students' reactions toward exploration of foreign knowledge, collaborative learning activities, online instant response, and reflective journal writing are summarized in Tables 2 to 5. "The class gives me the opportunity to obtain professional knowledge in Library and Information Science" was rated the highest (Mean = 4.58, SD = 0.501)

in the category of "exploration of foreign knowledge". "T.As' assistance stimulates my innovative thinking ability" was rated the highest (Mean = 4.48, SD = 0.640) in the category of "collaborative learning activities". "Reviewing others' peers' response encourages my motivation to respond in the class" was rated the highest (Mean = 4.45, SD =.552) in the category of "collaborative learning activities". "Reflective questions help me review what I have learned during the class" was rated the highest (Mean = 4.23, SD =.577) in the category of "reflective journal writing".

Table 1: Students' perceptions of exploration of foreign knowledge

Exploration of foreign knowledge	Mean	S.D
The class encourages me to explore updated knowledge of library professionals.	4.35	.622
The class inspires my motives to explore and acquire more knowledge about world libraries in different countries.	4.55	.552
The class gives me the opportunity to obtain professional knowledge in Library and Information Science.	4.58	.501
I learned to think about professional knowledge in English	4.15	.700

N=40 missing =0

Table 2: Students' perceptions of collaborative learning activities

Collaborative learning activities	Mean	S.D
This class creates an atmosphere that makes me comfortable sharing my thoughts with others.	4.23	.620
I learned to cooperate with different people and the cooperation inspires me.	4.40	.545
International collaboration increases my motivation toward learning.	4.25	.742
T.As' assistance stimulates my innovative thinking ability.	4.48	.640

N=40 missing =0

Table 3: Students' perceptions of the online response system

Instant response system	Mean	S.D
The instant response system helps me focus on class activities.	4.38	.586
Through the instant response system, I observe others' feedback.	4.40	.632
The instant response system can increase my enjoyment of learning.	4.35	.700
Compared with oral expression, I love to give my feedback through the instant response system.	3.85	.834
The instant response system triggers my critical thinking ability.	4.40	.632
Reviewing others' peer responses encourages my motivation to respond in the class.	4.45	.552
Compared with other classes, the use of instant response system encourage my active learning	4.15	.802

N=40 missing =0

Table 4: Students' perceptions of reflective journal writing

Reflective journal writing	Mean	S.D
Reflective questions help me review what I have learned during the class.	4.23	.577
Reflective questions help me clarify my expectations of knowledge exploration.	4.05	.677
Reflective questions encourage my learning reactions.	4.13	.648
The reflective journal helps me clear my thoughts.	3.98	.768
Reflective questions help me develop my descriptive skills.	4.08	.764
The reflective journal helps me review my learning progress.	4.15	.736
The reflective journal consolidates my learning.	4.02	.733
Reflective journal writing improves my English writing skills.	3.88	.757
From the questions raised in the reflective journal, I gained motivation to explore further.	3.88	.791
Sharing of questions triggers my new interest in specific information raised by others	3.93	.656
Reflective journal writing enhances my creativity	3.95	.714
Reflective journal writing makes me love my professional field.	3.88	.757

N=40 missing =0

Based on students' reflections each week, most students believed learning through eliciting questions helped them focus on the reading and exploration materials. Reflective journals reinforced the knowledge they learned. They felt like they had "*traveled to many world famous libraries*". Through question raising and discussion, they "*learned not only how to communicate with others in English, but also to understand and respect different opinions"*. Also, collaboration learning stimulated students' creativities: "*Peers' presentation and creativities inspire me"*. Lastly, the instant response system "*made the class fun, so students feel more like engaging in class activities"*.

Conclusion

This study adopts mixed methods of question eliciting, and reflection and discussion, using inquiry based learning and instant response system. The researchers attempt to promote a new approach to engaging students in learning. Learning begins with curiosity of learners. We encourage students to explore world knowledge by giving them greater autonomy over the use of information in the learning process. Hopefully this study can develop an appreciation in learners of the value of independent learning, and enable them to become lifelong learners.

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