A STUDY ON THE EFFECTS OF THE RUBRIC ON CONCURRENT DISCUSSION IN WEB-BASED ENVIRONMENT

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ABSTRACT

The purpose of this study was to research the effect of the rubric on the level of learners' cognitive engagement and to explore the effectiveness of Web-based concurrent discussions experienced by learners. The participants were 20 undergraduate students of D Women's University and they were divided into six groups for concurrent discussions in Web-based environment. Three groups of 10 participants were provided with rubric I to conduct self-evaluation and the remaining three groups of 10 participants were provided with rubric II to conduct self-evaluation and peer evaluation. After concurrent discussion in Web-based environment, it was found that the degree of learners' cognitive engagement using rubric II showed higher-level cognitive engagement than the other groups using rubric I. In addition, with regard to the level of learners' cognitive engagement, the groups using rubric II interacted more frequently with one another than the other groups using rubric I.

KEYWORDS

Concurrent discussion, rubric, cognitive engagement, peer evaluation

1. INTRODUCTION

Web-based discussion is considered important in that it contributes to expanding opportunities of convergence through the text-based interaction and promoting critical thinking and problem solving skills, which are important elements to lead successful learning in STEAM education (Lim, 2005; Lim, Yeon, & Kim, 2011; Harasim, 1990). Besides, the contents of discussion in Web-based discussions can be modified because the communication is text-based (Lee & Yang, 2009) and introspective learners who were difficult to participate in face-to-face discussions will be more active (Koh, 2004). In addition, it has positive effects such as the possibility of many-to-many discussions (Harasim, 1990), reduction of the impact of non-verbal elements like appearance and voice (Weisskirch & Milburn, 2003), mitigation of opinion collisions by plain emotional expressions, and the record of the contents of the discussion (Kyungsun Hong, 1999). Despite these advantages, however, most of learners experience difficulty in Web-based discussions. Therefore, various studies regarding design strategies for Web-based learning environment to promote discussions and to develop support tools are required in order to obtain an intended level of learning performance effectively (Park, 1998; Lim, Yeon, & Kim, 2011; Harasim, 1990).

One of strategies for overcoming the difficulties of Web-based discussions and eliciting the learning effect is to provide scaffoldings to support the discussion process. Among them, the rubric has been widely utilized as a strategy for leading discussions effectively and promoting cognitive engagement of a higher level such as critical thinking and problem solving skills. In addition, the evaluation area in the rubric is presented more precisely by describing the execution criteria in detail and it is possible for learners to enhance their critical thinking by evaluating objectively their and others' opinions. In particular, it can promote spontaneous interaction and lead the discussion effectively by inducing the learners' active participation in the discussion and providing opportunities for checking up the demonstration process with clear evaluation criteria (Toth, Suthers, & Lesgold, 2002). This study intended to improve the level of cognitive engagement of learners utilizing the rubric in the Web-based concurrent discussions by focusing on

the effect of these characteristics of the rubric. In addition, this study was to explore learners' experiences in the progress of Web-based concurrent discussion. For this, the major research questions are as follows:

First, what are the effects of the rubric type on the level of learners' cognitive engagement in Web-based concurrent discussion?

Second, how do the learners recognize the effectiveness of Web-based concurrent discussions using the rubric?

2. METHODS

2.1 Participants

The participants were twenty undergraduate students in a college of education. There were female students who took the course titled 'Methodology and Technology of Education.' This is a required course for pre-service teachers' training. Most of the students were juniors and had prior knowledge related to learning theories such as behaviorism, cognitivism, and constructivism. The students were randomly assigned to one of six groups.

2.2 Procedures

The independent variable of this study was the type of rubric and the dependent variables were the level of learners' cognitive engagement and the effectiveness of Web-based concurrent discussion using the rubric. The research design of the study is shown in *Table 1*.

Table 1. Research design

G1	O1	X1	O2
G2	O1	X2	O2

G1: the group of self-evaluation
G2: the group of self-evaluation and peer-evaluation
X1: rubric I for self-evaluation
X2: rubric II for self-evaluation and peer-evaluation
O1: pretest to measure the participants' prior knowledge
O2: posttest to measure the effectiveness of the rubric

To examine the effect of the rubric for Web-based concurrent discussion, this study was conducted through the procedure as in *Table 2*.

Table 2. Research procedure

Phase	Procedures
Research design	Design of the research model
Experimental tool development	Development of test tools
Group design	Placed in the experimental and control groups
Pretest	Check the homogeneity of the two groups
Experiment	Web-based concurrent discussion
Posttest	Measure the effectiveness of the rubric
Data analysis	Analysis of the level of cognitive engagement and the effectiveness

2.3 Research Tools

2.3.1 Web-Based Concurrent Discussion Environment

Web-based concurrent discussion environment was implemented using the café service of portal site Daum in consideration of user-friendliness and accessibility for the teacher and learners (see *Figure 1*).

Figure 1. Web-based concurrent discussion environment

2.3.2 Pretests

A pretest was used to measure the learners' knowledge before the Web-based concurrent discussion, and the test consisted of ten multiple-choice questions. The questions were related to discussion topics such as behaviorism, cognitivism, and constructivism. The reliability coefficient of the pretest (Chronbach's alpha) was .51 and identity verification results showed homogeneity between the two groups (F=.29, p=.60).

2.3.3 Rubric

The rubric has been provided to support self-evaluation and peer-evaluation. Based on the previous studies of Paul and Elder (2013), this study used the rubric to develop subjective questionnaires. The rubric used the same questions for both self-evaluation and peer-evaluation and a 5-point Likert scale was developed to measure five items of the rubric such as clarity, accuracy, relevance, logical order, and depth.

2.3.4 Cognitive Engagement Level

Analysis of the level of learners' cognitive engagement in Web-based concurrent discussion used Lee's (2005) cognitive engagement analysis system of online learning. It consisted of four items such as criticism, expansion, repetition, and unproductivity. In addition, the Discussion Analysis Tool (DAT) by Jeong (2005) was used in order to investigate the effect of the rubric on the flow of Web-based concurrent discussion.

2.3.5 Effectiveness of Web-Based Concurrent Discussion

The perceived effectiveness of Web-based concurrent discussion using the rubric was measured after the discussion through open-ended questions. The open-ended questions were about how the learners recognized the effectiveness of Web-based concurrent discussion and the rubric.

2.4 Data Collection and Analysis

The dependent variable analyzed in this study was the level of cognitive engagement and the independent variable was rubric type. For the comparative analysis of rubric types, χ^2–test was conducted by PSAW Statistics 18 and the significance level for statistical verification was set to .05. In addition, the DAT of Jeong (2005) was used to analyze interaction between the cognitive engagement level and the flow of discussion. Questionnaire analysis was conducted in order to explore the perceived effectiveness of Web-based concurrent discussion using the rubric (see *Table 3*).

Table 3. Research procedure

	Data	Data collection	Data analysis
The level of cognitive engagement	Discussion	Conversations occurring in the progress of discussion	χ^2-test DAT analysis
Perceived effectiveness	Open-ended questions	Survey after discussion	Questionnaire analysis

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