Title: Learning Achieved In Structured Online Debates: Levels of Learning And Types Of Constraints

Short description:

The purpose of this study was to: a) examine to what extent each of Bloom’s six levels of cognitive learning outcomes were exhibited among four types of postings (argument, critique, evidence, and explanation) in online structured debates; and b) which of these postings were most likely to elicit responses with the highest levels of cognitive learning outcomes. Four structured online debates were analyzed. The results indicated that critique messages were most likely to exhibit higher level learning. Implications for instructions and directions for future studies building on the findings of this study are discussed.

Abstract

Introduction

Structured online debate has been examined as a way to enhance cognitive learning (Jeong & Joung, 2007). However, the findings have been mixed. For example, Cho and Jonassen (2002) reported that students generated more claims and grounds but the students who did not use constraint-based argumentation produced more warrants. Furthermore,no significant differences were found in the quality of individual problem solving performance between the two groups. Similarly, Jeong and Joung (2007) reported that the use of constraints did not increase the frequencies of messages that presented supporting evidence, critiques, and explanations.

The mixed results on the effects of structured online debates may be due to the different outcomes that were examined between the different studies. Previous studies used different terms in describing the outcomes of structured debates, such as problem solving performance and increased frequency of certain types of messages. As a result, it is difficult to assess the overall results across these multiple studies. Given that student learning is the ultimate goal of these instructional interventions, it could be beneficial if we examine the outcome of structured debates in a more general framework, such as levels of cognitive learning defined in Bloom’s taxonomy. The use of Bloom’s taxonomy of cognitive learning outcomes may enable us to learn how well the students learn the content knowledge. In turn, information of how well the structured online debates facilitate learning across Bloom’s levels of cognitive learning may help educators develop insights on how and when to use online debates as an instructional tool. Lilkewise, knowledge of the specific levels of learning achieved in structured debates may provide important insights into how to improve the design and implementation of constraint-based argumentation. Identifying the relationships between types of debate postings and levels of learning can enable us to predict which types of messages are more likely to elicit higher level cognition.

This purpose of this study was to determine to what extent each level of cognitive learning was achieved within each of the four types of posting (argument, critique, explain, evidence) used in online debates. The second purpose of this study was to identify which type(s) of message was more likely to exhibit a particular level of cognitive learning (knowledge, comprehension, application, analysis, synthesis and evaluation). A third purpose of this study was to identify what types of postings (e.g. argument 🡪 critique, critique 🡪 explanation) were most likely to elicit the types of responses that exhibited the higher levels of learning (e.g. analysis, synthesis, and evaluation).

Method

Participants were 33 graduate students enrolled in an online introductory course of distance education. Students in the online course participated in a total of four weekly online debates on given topics. For each debate, the participants were randomly assigned to one of the two teams: supporting team and opposing team. Students were required to post any one of the four types of messages when they support or refute a posting that presented an argument, supporting evidence, a critique, and/or an explanation. Students were required to insert tags (ARG, BUT, EVID, EXPL) into the subject headings to identify the type and function of each message they posted to the online debates.

**Levels of Learning**

Levels of learning achieved in the structured debates were assessed using Bloom’s (1958) taxonomy of cognitive learning outcomes. The six levels of learning from low to high were: knowledge, comprehension, application, analysis, synthesis, and evaluation. Each message in the four debates was coded into one of the six levels of learning. A message was assigned the highest level of learning when it contained more than one level of learning. A second coder coded one debate and a comparison of the codes between the first and second coder produced an inter-rater agreement rate of 81.4%.

Results

Five out of six levels of learning were exhibited in different extent in each type of message constraints. For argument and evidence message constraints, four out of the six levels of learning were exhibited while no knowledge or evaluation was observed in these two types of messages. While no knowledge level learning was found in critique and explanation messages, all other five levels of learning were observed. Chi-square tests indicated that students were more likely to exhibit high levels of learning in critiques and arguments and less likely to engage in high level processing when constructing and posting evidence messages. In addition, exchange pairs that ended with critiques were most likely to demonstrate high levels of learning. It is very noticeable that 80% of the highest level of learning, evaluation, was generated in exchange pairs ended with critiques. Further investigation of the patterns of exchange pairs and learning outcomes indicated that argument was most likely to elicit higher level responses even though the total number of argument postings was not the greatest.

**Implications and Conclusions**

The data in this study shows that structured debates can be an effective method to engage online learners in exchanging message and responses that foster high levels of cognitive learning. Based on the findings, we suggest that instructors examine both the frequency of messages types and the frequency of responses types elicited by each message type to gain insight into how cognitive learning emerges from student-student interaction. Instructors should pay particular attention to arguments and critiques. If the number of critiques is low, it is likely that the students do not engage in higher level debates and learning. As a result, certain strategies should be applied to encourage students to reflect, critic, and integrate ideas.

We suggest that future studies examine: a) how specific interventions intended promote more argumentation affect cognitive learning; b) other types of postings that might help us gain further insight into how, where, and when particular messages and message-response exchanges tend to elicit each of the levels of cognitive learning; c) the effects of different types of discussion topics (e.g., degree of controversy); d) the effects of specific learner characteristics such intellectual openness, agreeability, and gender.