Help-Seeking Behavior and Learning with Hypermedia

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Abstract: The help-seeking behavior of 67 learners (29 low and 38 high conceptual-gain) using a hypermedia environment to learn about the circulatory system was investigated in a naturalistic tutoring condition. Results showed that participants who demonstrated greater conceptual gain (from pretest to posttest) asked significantly greater number of *cognitive* questions relating to the content of the material than *context* questions pertaining to the environment. The study has implications for understanding the role of help-seeking behavior during learning with hypermedia and the design of hypermedia tools to facilitate help-seeking behavior.

Help-Seeking Behavior

The ability to identify need for assistance and then obtain help from appropriate sources has been identified by many as a key behavior for coping with difficulties encountered during learning (Newman, 2002; Pintrich, 2000). Academic help-seeking requires the learner to be monitoring progress toward the learning goals. If the learner faces difficulty, she/he must become aware of a need for assistance, identify an appropriate source for help, and subsequently communicate this need effectively to obtain the appropriate response from the source of help. Help-seeking is thus an adaptive behavior that forms an essential part of the arsenal of a learner's self-regulatory skills. Further, help-seeking behavior serves as the link that ensures that the external regulation provided by a teacher, peer or some other externally regulating agent (Azevedo, Cromley, Winters, Moos & Greene, 2005) is in tune with the internal regulation performed by the learner.

Although, a significant body of work so far has underscored the importance of help-seeking as a learning strategy, help-seeking has been relatively less studied with interactive and hypermedia environments (Aleven, Stahl, Schworm, 2003; Graesser & Person, 1994). It has been even less studied for ill-structured tasks, such as learning about challenging domain-specific topics. Furthermore, most studies have been self-report studies that fail to capture actual instances of help-seeking and the social-interactional aspect of help seeking behavior.

The present study evaluated help-seeking behavior of learners in a naturalistic tutoring condition while learning about a challenging science topic (the circulatory system) from a hypermedia environment. Our study examined the difference in types of help seeking behavior between learners who gain in conceptual understanding and those who do not. The study has important implications in understanding the role of help-seeking behavior during learning with hypermedia and in informing the design of hypermedia tools for learning.

Method

Our participants were 67 students from an urban, mid-Atlantic middle school, high school and University and constitute a subset of participants (57%) from a larger study. Twenty-six 7th grade students (mean age = 12.1 years) and 18 high school students (mean age = 14.7 years) received community service credit and 23 University students (mean age = 21.1 years) received extra credit for a course for participating in the study. These participants were chosen as a subset of the larger sample because all were classified as starting with low conceptual understanding, based on pretest mental model, and making little conceptual gain (Low group), or making high conceptual gain (High group), based on post-test mental models of the circulatory system.

Students spent 20 minutes completing a pretest (from Azevedo et al., 2005), including an essay for assessing students' mental models of the circulatory system. An introduction to using the hypermedia environment was then given; showing the contents and features, including multiple representations of information, of three articles most relevant articles for learning about the circulatory system.

Participants had 40 minutes for the learning task and had access to the instructions and the global learning goal ("*Make sure you learn about the different parts and their purpose, how they work both individually and together, and how they support the human body"*) during the period. All participants worked with the same human

tutor who facilitated their self-regulated learning by prompting students to activate their prior knowledge, plan their time and effort, monitor their progress towards goals and to use several strategies such as summarizing, coordinating informational sources, hypothesizing and drawing. The students were able to engage in help-seeking during the learning task but the tutor did not provide knowledge extraneous to the information in the hypermedia environment. After the learning task, a 20 minute posttest, identical to the pretest, was administered to all participants.

Data Analysis & Results

The coding and scoring of the pretest and posttest mental models and the segmentation of the participants' verbalizations during the tutoring session was identical to that of Azevedo and colleagues (2004). For this study, students' scores on their pretest and posttest mental models were used to categorize them into groups based on how much they learned during the session. A more fine-grained analysis of students' help-seeking behavior based on the coded transcription was conducted by the first author, and each instance was coded into one of two types: *cognitive* or *contextual help-seeking behavior*. *Cognitive help-seeking behavior* included requests by students for help in understanding the content of the hypermedia articles, clarification of an idea, delimiting the task, and confirmation of understanding (e.g. "*Aren't like arteries thicker than veins?"*).While *contextual help-seeking behavior* included requests by students for help in navigating the hypermedia environment, clarification of task and tutor's role, and instructions (e.g. "*I can take notes you said, right?"*).

We categorized students based on the type of help-seeking they engaged in most during the tutoring session. We conducted 3X2 chi-square analyses to determine whether the different conceptual understanding groups differed on their majority type of help-seeking behaviors. The chi-square was significant (χ^2 [2, N = 67] = 7.47, $p <$ .05) and revealed that 30% of students in the low conceptual-gain group engaged in more *context help-seeking* than *cognitive help-seeking*, compared to only 5% of students in the high conceptual-gain group. Eighty-three percent of high students engaged in more *cognitive help-seeking* than *context help-seeking*, compared to 56% of students in the low group. Four students in both groups engaged in equal numbers of *cognitive* and *context help-seeking*. These results demonstrate that higher percentage of students in the high group engaged in significantly more *cognitive* than *context help-seeking* than their low conceptual-gain counterparts, who engaged in more *context* than *cognitive help seeking* compared to students in the high group.

Discussion

Our results demonstrate that in a naturalistic human tutoring condition students engage in help-seeking behavior. However, not all help-seeking behavior is alike. This study demonstrates differences between the kind of help solicited by learners who show large gains in understanding versus help solicited by learners who do show low or no gains in understanding. It is possible that since students who do not show large gains in understanding after a learning session engage in more questions regarding superficial details of the learning task that these learners are unable to formulate appropriate questions that will help them draw closer to their learning goals. While this is an initial study on the topic of help-seeking while learning with hypermedia, it is expected that with further research into the correlates of help-seeking behavior can yield a deeper insight on the role of the behavior in mediating self- and external regulated learning. Future research also needs to focus on ways of facilitating help-seeking behavior in those who need help most while learning with hypermedia.

References

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