

The Collaborative Information Behavior of Middle School Students in Online Learning Environments: An Exploratory Study

Introduction

The emergence of social computing systems such as blogs and online communities is shaping people's way of working, learning, and interacting with others. Teenagers and preteenagers are leading the transition "to a fully wired and mobile nation" (Lenhart, Madden, & Hitlin, 2005). A growing body of research indicates that today's young people, often referred to as the Millennial Generation or as "digital natives" (Prensky, 2001), are heavy users of social computing media and that much of their information seeking and socialization takes place via Instant Messaging (IM), text messaging, blogs, wikis, email, and the World Wide Web (DeBell & Chapman, 2006; Harris, 2005; Lenhart, Madden, & Hitlin, 2005; Rideout, Roberts, & Foehr, 2005). Although the study of human information behavior (IB) is a rapidly growing subset of library and information science research, most IB research has focused on studying individual behaviors. We need to understand better how people "need, seek, give, and use information" (Fisher et al, 2006) *in groups* and in the context of online communities that use social computing technologies as well.

At the Virtual Math Teams (VMT) project (<http://mathforum.org/vmt/>), we are studying how middle school students work on math problems together and how they create and maintain online communities. As part of the VMT's larger research agenda, this study explores how students collaborate on math problem solving in online learning environments and looks into how they identify and address their information needs during this process.

Research Method

The VMT project has held over 80 sessions with groups of U.S. middle school students in naturalistic settings where they log into the online environments from home or school. Interactions are mediated entirely through the virtual environment using VMT Chat. Developed specifically for the project, VMT Chat includes a chat program and a shared whiteboard with drawing tools. Typical VMT sessions are about one hour long and are recorded for later participant access as well as for analysis purposes.

Taking the group as the unit of analysis, we have adopted an ethnomethodologically-informed approach (Garfinkel, 1967) based on aspects of conversation analysis (Sacks, 1992) to analyze participant interactions. We have held weekly data sessions at VMT during which researchers examine data excerpts of interest and discuss observations and findings. Such micro-level analysis usually focuses on episodes of activities that are of research interest and tries to identify and describe the observable methods participants use to make sense of their interactions from an interactional perspective.

Findings

Constructing shared meaning

As is typical of the Millennial Generation, most of our participants are Internet savvy and are skillful users of online chat programs. They bring the behaviors they are familiar with into the online environment and use various methods either that they already knew of or that they construct using available resources to make sense of the new environment and the interactions taking place within it. At the same time, they may not be experienced with collaborating online, especially in doing mathematics, since math is usually considered a solitary endeavor in classroom settings. The chat environment is a complex social world where participants come with certain goals and expectations. Together as a group, they coordinate with each other and construct their shared experience of collaborating online. Among all sorts of activities participants

tend to engage in, one noticeably important behavior during the collaboration process involves working together to achieve shared meaning. The work participants do to construct shared meaning is not merely simple information exchange but rather co-construction of meaning, which emerges as an achievement of the interactions.

Information needs as an interactional achievement

Provided the *math problem* they are to work out together, students first need to construct *their own problem*. That is, they need to identify what is known and what still needs to be figured out. This process is negotiated and the problem is constituted interactionally. Participants ask various questions to clarify, to request explanation or elaboration from their teammates, to seek information, to engage others to participate, and so on. Information needs for math problem solving emerge in and through the interactions as an interactional achievement. There are observable members' methods (Garfinkel, 1967) and tactics participants use for doing such collaborative formulation of information needs. Under such situations, information needs often emerge 1) when there is imbalance of what is known among the group members and 2) when the group identifies a shared knowledge deficiency. Once an information need is identified, participants use different methods to satisfy it, for example, by offering what they know, seeking information from the group, or using external resources.

Group as information source

The data from the VMT sessions also show that participants take the group as one primary resource for information. There are different ways questions are posed within the group. Some are designed and to be read as calling for reminder of math information when one claims that he "forgot." Some call for factual information, whereas some ask for explanation of work that has been done by other members. Often, participants provide information in order to seek information. They also may provide possible answer to an information question. Information is also provided by participants in different ways when responding to questions posed within the group. In some cases, one participant provides information intended to directly answer a question from another group member, while in other cases a reference is provided that points to some online resource that presumably has information to answer the question.

Implications

This study is a first step in understanding collaboration and learning in online chat environments. An understanding of student collaboration in social computing environments such as the VMT will go a long way toward building a better understanding of the information behaviors of the Millennial Generation, a generation that seems to place strong emphasis on group interaction and learning (Oblinger, 2003). Such an understanding could also lead to recommendations for designing online learning environments and digital libraries (Zhou & Stahl, 2007) that can better support students' group learning behaviors and preferences.

References

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