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The Development and Testing of a Tool for Analysis of Computer Mediated Conferencing Transcripts

Background

Interaction by means of computer-mediated communications (CMC) is widely discussed in the distance education literature (Abrami & Bures, 1996; Anand & Haughey, 1997; Bates, 1995; Dede, 1996; Jonassen, 1998; Maier, Barnett, Warner & Brunner, 1996; Nixon & Salmon, 1996). However, much of the literature is more arbitrarily prescriptive or merely anecdotal than empirical (Gunawardena, Lowe, & Anderson, 1997). It appeared that, despite several possible candidates, a notable barrier to more rigorous research was the lack of a recognized CMC analysis tool.

Process

Beginning in late 1998 a team of faculty and students of Athabasca University's Master of Distance Education (MDE) program reviewed the literature on CMC analysis, comprising some 224 publications, seeking models or tools that might provide reliable analysis of CMC interactions. A total of 10 possible models or analytic approaches were identified (Fahy et al., 1999). A comparative review of the models was then conducted by the team, and two models (Bullen, 1997; Zhu, 1996) were chosen for further study based on their perceived (a) ease of use, (b) reliability, (c) validity, (d) theoretical support, and (e) cross-discipline utility.

Features of the Analytic Models Selected for Further Research

The Bullen and Zhu instruments focus on different aspects of CMC interaction. Zhu's (1996) work, based on Vygotsky's theory of *proximal development*, focuses on social negotiation, collaborative sense-making, and mentoring as ways of

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improving participants' problem-solving capabilities. The model classifies postings as vertical or horizontal:

- *Vertical interactions* seek an answer from a more capable or better informed member rather than contributing to or constructing knowledge collaboratively.
- *Horizontal interactions* assume there is no authoritative or correct answer, and members must therefore interact to construct an acceptable compromise answer (p. 824).

Zhu applied her instrument to conference transcripts and concluded there were two likely processes for knowledge construction in an electronic communications environment:

- *Construction of knowledge* by a group influenced, motivated, and facilitated by discussion and interaction among peers.
- *Simple assimilation of information proposed by others*, perhaps with some personal editing or adaptation, but without significant interpersonal interaction (p. 840).

Bullen's (1997) CMC analysis tool focuses on the relation between critical thinking and participation. The classification categories are:

1. *Seeking clarification*: attempting to appraise and understand the exact nature of the problem, issue or dilemma, including acknowledging and attempting to understand different points of view on an issue.
2. *Assessing evidence*: judging the credibility of sources of information and observations and the quality of the data offered as evidence.
3. *Making and judging inferences*: assessing the soundness of inductive and deductive inferences and value judgments used in making decisions.
4. *Using appropriate strategies and tactics*: using strategies as appropriate guides in critical thinking.

The instrument was developed and tested on sample transcripts from a graduate course in distance education, which were analyzed by two researchers independently. The researchers reported high levels of agreement (approximately 90%) after analyzing two sets of transcripts.

Further Modification and Piloting of the Zhu Instrument

Although both the Bullen and the Zhu models produced promising results, Zhu's (1996) model was chosen by the research team for further development. Changes to the Zhu analytic tool resulted in a new tool called the "transcript analysis tool" (or MDE TAT) by the Athabasca University research team. The MDE TAT uses the following classification categories:

1. *Vertical questioning*. Emphasis is on the acquisition of data or information, with the question addressed to the person viewed as most likely to possess the "correct" answer.
2. *Horizontal questioning*. As in Zhu's formulation, the purpose is to initiate or invite a dialogue. Horizontal questions anticipate collaboration and discussion to produce an acceptable answer or compromise solution or to increase consensus. No "correct" answer is assumed necessarily to exist.
3. *Statements*. These contain no self-revelation and usually do not invite dialogue. The speaker, like a lecturer, provides information or correction

to an audience assumed to be uninformed or in error. A "correct" answer is implied, and the speaker believes he or she possesses it.

4. *Reflections*. The speaker reveals his or her internal conflicts, values, beliefs, reasoning processes, misgivings, and doubts and provides other insights into his or her personal, individual, and usually invisible thinking processes. In reflections the speaker assumes listeners are interested in these personal revelations, are empathetic, and will respond with acceptance and support. Replies in kind are welcome, as are horizontal questions, scaffolding, and other "accepting" responses.
5. *Scaffolding*. The speaker invites others to comment. Scaffolding comments include those that call on or name others, refer to others' views, or address shared group experiences.

The MDE TAT was tested in a graduate course in distance education, where transcripts were analyzed by two researchers independently. The interrater reliability between the two raters was high (94%). Following this first application, the tool was modified slightly and tested again by a third researcher on a new sample transcript. The third researcher and the two original researchers independently analyzed another transcript, with an interrater reliability among the three researchers of 84%. Finally, after further revisions, a third transcript was analyzed to determine ease of use and reliability. The researchers concluded that the tool was easy to learn to use, and reliability for the third set of transcript was 70% (Fahy et al., 1999).

Conclusion

We continue to investigate and apply the MDE TAT. (One of the student members of the group has recently completed a thesis, in part based on this work; Keller, 1999). Future efforts will focus on making the tool more reliable and using it to analyze more lengthy and complex transcripts. Among the questions we have posed for continuing investigation are:

- What types of interactions are associated with greater or lesser levels of participation and satisfaction as reported by participants?
- How does moderator conference behavior affect participants?
- How does participant interaction affect the conferencing behavior of other participants?

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