DOCUMENT RESUME

ED 414 784 HE 030 585

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TITLE A Sociocultural Approach to Understanding Distance Learning.
PUB DATE 1997-00-00
NOTE 7p.
PUB TYPE Reports - Research (143)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Child Development; Classroom Communication; *Classroom Environment; College Instruction; *College Students; Communication Research; *Communication Skills; *Distance Education; Field Studies; Higher Education; Statistical Analysis; *Student Attitudes; *Teleconferencing
IDENTIFIERS Learning Communities

ABSTRACT

This study examined how collaborative processes of communication and knowledge construction over time and space are structured and organized utilizing two-way video conferencing strategies for distance education in undergraduate child development courses at two universities. Several qualitative research methodologies were employed to document processes of interaction and the development of a learning community. The courses used two-way video conferencing and e-mail correspondence as an integral part of a practicum experience, which involved fieldwork, centered around computer-mediated learning, in an after-school program for young children. It was found that the conferences with the most undergraduate participation in "telling stories" from the field and the least amount of lecturing from professors were rated the most highly by undergraduates. The students reported in their distance learning fieldnotes that the possibility of having to present their ideas on "television" to an audience of distant peers led them to carry out their assignments with a great deal more effort than they ordinarily would have invested. However, students reported that since speaking was such an "event" in the context of videoconferencing, they did not always feel comfortable making brief supportive remarks and thereby using a television framework for social interaction did not always lead to a collaborative learning environment. (Contains 18 references.) (MDM)

A Sociocultural Approach to Understanding Distance Learning

What we have to learn to do we learn by doing.
Aristotle, *Ethica Nicomachea II* (c. 325 B.C.)

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Abstract: This investigation documents how collaborative processes of communication and knowledge construction over time and space are structured and organized utilizing two-way video conferencing strategies for distance education in an undergraduate course in child development at two universities. The impact of a learning-centered approach to video conferencing, the on-going technical and organizational support needed to sustain changes in pedagogy using new technologies, and the mediating force of television frameworks are discussed. The authors suggest that sociocultural theories of learning and development provide a new and productive theoretical basis for developing distance learning instructional technologies.

This study examines a year-long collaboration among organizers from two universities who designed and implemented two-way video conferencing and email activities as an integral part of a child development practicum. Each quarter the two classes met four times for video conferences that lasted one-hour and twenty minutes. In addition to following the same syllabus, all students at both campuses conducted fieldwork with children in a unique after-school program centered around computer-mediated learning known as The Fifth Dimension.[2] The practicum encouraged university students to combine theory and practice. The distance learning element of the course was envisioned as a medium through which students would share their empirical/theoretical syntheses in a collaborative learning environment. Students were expected to be active participants during the video conferences and lectures by professors were kept to a minimum. This scenario is unlike the usual distance learning environment where one professor, teaching from a host school, instructs students at his/her site as well as students at a distant site. In this more common arrangement, models of traditional classroom teaching are imported wholesale into the videoconferencing setting; i.e., the distance learning course is conducted by one instructor who lectures to a relatively passive audience of local and distant students. The project discussed here was carried out by two professors every quarter who collaborated with one another and with a research assistant whose job it was to plan the video conferences and provide the support necessary to carry them out. While much of the literature on distance learning emphasizes the supposed need to

[1] This paper is equally co-authored.
[2] See [Nicolopoulou & Cole, 1993] for an explanation of the history, design, and principles of the The Fifth Dimension.

imitate as closely as possible the "normal" classroom setting, the goal here was to implement a use for the technology that went beyond the average university lecture.

The child development practicum was also organized to move beyond the traditional dichotomy of teacher-centered vs. student-centered to a more productive use of instructional technology that was learning-centered [see Lave & Wenger 1991]. A learning-centered approach reflects the complexities of strategically organizing interaction so that responsibilities for participation continually shift among participants. As a consequence, this class evidenced continual shifts in expert/novice roles between instructors and students as a result of the undergraduates' developing and exhibiting expertise. For this reason, in the classroom and distance learning settings, learning was best characterized as changing participation [Rogoff, in press] in which the inherently bi-directional processes of learning were viewed as resources for the co-production of knowledge, see [Ochs 1991], [Stone 1996].

Theoretical Background

Theoretical grounding for researching the social environment of learning and instruction is found in paradigms where cognition is considered to be socially constructed, see [Cole & Cole 1989], [Crook 1994], [Jonassen et al. 1995], [Leont'ev 1981], [Luria 1976], [Ochs 1988], [Rogoff & Lave 1984], [Stone 1996], [Vygotsky1978]. In these paradigms, commonly referred to as sociocultural theories of development, the assumption is that knowledge production cannot be studied independently of the social context. Further, cognitive skills are considered to be promoted through joint activity (proximal and distal). The founders of the sociocultural approach to the development of thought, Vygotsky, Leont'ev, and Luria, hold that semiotics (tools and signs) mediate development during social interaction. To evaluate the collaborative approach to two-way video conferencing and telecommunications, the semiotic tools examined closely in this study are distance learning studios/classrooms, email communications, and instructional technologies. An activity theoretic (AT) approach is used to illustrate the mutual relationship between individuals, mediational artifacts, the object[3] of activity vis-a-vis the emerging culture of two universities collaborating over space and time. More specifically, AT allows researchers to document the transformation process in which participants develop an understanding of how to communicate and co-construct knowledge utilizing telecommunications/conferencing technologies.

Research Questions

The following research questions were used to investigate the distance learning course:

1. What was the nature of the collaborative processes between the two universities?

2. How was instructional technology in distance learning sessions organized and structured to reflect a sociocultural perspective on learning and development?

Methods

To answer the research questions, a combination of qualitative research methodologies were employed to document processes of interaction and the development of a learning community. Participant observation

[3] The object of activity, *qua* the transformation process, cannot be reduced to the notion of a goal or single end point. In fact, a multitude of goals arise as a natural outcome of participation in situated activities. As a consequence, the construct of object is more closely related to a *field of potentials* in which the cultural production of knowledge obtains in the dynamic processes of social action mediated by cultural artifacts, e.g., distance learning settings. While the object of situated practices stimulates social action it does not fix in any predetermined way the unfolding nature of social action, which is opportunistic and creative [Engeström 1993], [Stone 1996].

fieldnotes by undergraduate students, support personnel, and instructors were gathered. Email correspondence among students and program implementors were collected for the duration of the project. In addition, social interactions were documented between and among participants utilizing two data sources: video tapes of the distance learning classes and a Web page that provided a bulletin board and chat room options. Semi-structured interviews of undergraduate and elementary students were gathered to verify attitudes and assessments found in participant observation fieldnotes. These five data sources provided a means for the researchers to triangulate their findings [Denzin 1978].

Findings

Peer-Mediated Learning and a Sense of Shared Purpose

Those conferences with the most undergraduate participation in "telling stories" from the field and the least amount of lecturing from professors were rated the most highly by undergraduates. The undergraduates were informed that there are Fifth Dimension programs in place throughout the world, but it was the opportunity to actually exchange experiences with undergraduates at a distant site who were involved in the same work that resulted in a sense of shared purpose. This shared purpose, as well as the practical advice they received from one another, positively influenced the undergraduates' attitudes toward the coursework they were asked to perform.

The goal of the practicum course, from the perspective of the professors, was to guide the undergraduates in making connections between their ethnographic data and concepts from theories of child development outlined in the course readings. During the first quarter, when the video conferences were mostly dedicated to discussions about the readings, many of the students expressed the desire to reserve their on-line time for the sharing of experiences and to leave theoretical considerations aside. During the second quarter, the goals of the professors and of the students were combined and the students were asked to share an example from their fieldwork that illustrated a concept from the readings. From an activity theoretic perspective, the field of potential for the video conferences, which included the object of the students'—the telling of entertaining stories—and the object of the professors'—students' co-production of theoretical knowledge—was an on-going site of negotiation.

The role of the professors was to moderate the conference and to follow-up on presentations made by students. The participation of the professors was evaluated positively when they briefly elaborated on or re-directed students' understandings of the key theoretical concepts, and was evaluated negatively when they resorted to lecturing for more than ten minutes. Students were the least tolerant of lengthy lectures delivered by the distant professor. Many students even assigned malevolent intentions to the professor from the distant campus, writing that he or she was trying to "show off" or "take over." Equal collaboration was so important to the students that they reacted with a certain hostility when this ideal was perceived to have been violated. How professors constructed the role of moderator, then, influenced students' perception of on-line collaboration and thus functioned as a possible facilitator or barrier to future distance learning classes.

Mirroring undergraduates' views about the importance of equal collaboration, active participation by students was an indicator of both successful communication and the successful production of knowledge. Undergraduates who were either called on or who volunteered to share theoretical interpretations of their data gave the most positive evaluations of the video conferences and reported being proud of their demonstrated abilities to interpret the readings and effectively apply the relevant concepts. Non-presenting students wrote that they were able to develop more sophisticated understandings of the theories after hearing the examples outlined by their peers and by participating in the resulting discussions. The students used email to follow-up on topics of conversation generated during the conferences and to exchange fieldnote data for use in their final papers. Theoretical understandings were cultivated in the context of dynamic relations of exchange [Newman et al. 1989] and zones of proximal development[4] emerged where students maintained shifting roles as the more

[4] The zone of proximal development (i.e., Zo-ped) is a cultural construct developed in [Vygotsky 1978] to address the role of social interactional processes of learning in relation to developmental processes. It is defined as the difference between a person's "'actual development level as determined by independent

capable peers guiding the development of their fellow students, and as the novices whose learning, in turn, was cultivated by others.

The Mediating Force of Television

Obviously, having students share understandings of social theories of child development and their relevancy to qualitative fieldwork data can take place in the regular classroom. So what does the medium of videoconferencing add to such an exercise? The students reported in their distance learning fieldnotes that the possibility of having to present their ideas on "television" to an audience of distant peers led them to carry out their assignments with a great deal more effort than they ordinarily would have invested. The material spaces in which the distance learning classes took place were interpreted by the students as television production settings. The room at one of the two campuses was an actual television studio with two mobile studio cameras operated by technicians, two monitors, hanging microphones, a set, and a bank of studio lights. The distance learning room at the other campus was constructed to simulate a regular classroom setting as much as possible, but the space was equipped with cameras, monitors, microphones, and a technician, and thus also read as "television." Since television is an historically constituted medium, students brought with them many of the cultural meanings associated with its production and use. Evidence that these frameworks were present came in the form of jokes about having to "primp" for the camera, concerns about close-up shots of themselves, audience behavior that did not conform to the norms of politeness in proximal social settings (i.e., mumbling to students sitting next to them, exchanging of inquisitive looks, rolling eyes, acting impatient), extreme nervousness before speaking which was explicitly related to notions of "performance," and the belief that you had better have something articulate and meaningful to say if you were going to take up valuable "air time" and ask that the equipment, the moderator, and the distant audience execute the coordination necessary to make your participation possible. Knowing themselves to be impatient consumers of boring "television," the students did not want to be responsible for contributing to its production. In fact, during each of the student-planned and student-moderated conferences (the last of the four each quarter) a great deal of effort was put into making the class entertaining. Among other things, the students showed amusing videos, played "Twilight Zone" music, and acted out scenarios from their ethnographic data.

Paradoxically, however, this television framework for social interaction did not always lead to a collaborative learning environment. Students reported that since speaking was such an "event" in the context of videoconferencing, they did not feel comfortable making brief supportive remarks such as "I agree" or "That was interesting." And, as alluded to above, the distance made it possible for students to be less considerate of their peers at the other campus and they had a tendency to be more judgmental about their ideas and comments. However, these dynamics were discussed in the regular classroom settings and the students at both campuses reflected openly about these tendencies and often tried to make up for misunderstandings by writing supportive email and by thanking participants during the video conferences.

Structured Support and Collaborative Success

How did this teleconferencing endeavor succeed given the barriers of multiple participants unfamiliar with the technology? The success of this videoconferencing endeavor was due in large part to a research assistant, whose job it was to plan the video conference by delineating the structure of who talked when and by providing support in terms of the technical aspects of video production[5]. In order to coordinate between the two university sites, the research assistant attempted to stay in continual contact with the course instructors so that an adequate degree of shared meaning about the collective process of on-line collaboration could be

problem solving' and the level of 'potential development as determined through problem solving under guidance or in collaboration with more capable peer'" [Griffin & Cole 1984].

[5] The research assistant's participation was supported by Professor Michael Cole at the Laboratory of Comparative Human Cognition who had the foresight and wisdom to recognize the importance of ongoing technical support for changes in pedagogy in higher education.

maintained. Her supportive role was critical to the effective implementation of videoconferencing given the continual change in site instructors and their "multiple realities" [Fullan & Stiegelbauer 1991]. The research assistant and the instructor who consistently taught the class at one site worked together closely and were involved in an ongoing process of collaboration that structured continual re-evaluation of classes, not only in relation to student evaluations of each distance learning class, but also to sociocultural theories of learning and development. Consequently, implementation strategies developed by the research assistant shifted over time to reflect larger pedagogical goals. For example, the critical issues of how to structure the role of the teacher or student *qua* moderator became a continual topic of negotiation. These discussions centered around what constitutes an appropriate leading activity[6] for social interaction on-line. The role of the moderators was crafted to promote leading activities as students shared personal experiences and interpretations of readings during on-line sessions.

Discussion

Despite the discontinuities brought into the activity by multiple faculty participants at one site and the sometimes inhibiting framework of television, collaboration in this setting was successful in terms of overall program goals: active on-line engagement and co-production of knowledge. As the class progressed each quarter, undergraduates became more involved in video conference discussions about course content and research experiences. Moreover, as the format of the conferences became more stable due to better understandings about how to structure participation, so too did the sophistication of undergraduate contributions to the class. For example, in the first course, undergraduates tended to talk more about personal research experiences in the field with little regard for explanatory theories contained in the course readings and complained incessantly about having to discuss readings on-line. In contrast, undergraduates who participated in the second quarter related their experiences to theoretical constructs more frequently and with greater enthusiasm and interest.

Sociocultural theories of learning and development can provide a theoretical basis for developing distance learning instructional technologies. Pedagogical approaches that conceptualize learning as a process of changing participation provide a productive lens for reconceptualizing the roles of teachers and students. Static categories with predetermined responsibilities are replaced by a more complex and ecological view of learning in which collaborative learning environments necessarily involve continual shifts in expert-novice roles as students and teachers learn from each other and respond to continual changes in understanding. Such a complex view of learning necessarily requires better understandings of what resources are needed to produce new knowledge and how those resources ought to be employed. Attention to these important dimensions of learning processes is necessary in the selection and organization of effective leading activities so that movement through the zone of proximal development can be facilitated. Promoted here is the view that sociocultural approaches to learning lend themselves to more productive uses of new instructional technologies like videoconferencing. Learning-centered collaboration across distance can be a powerfully validating force for undergraduates struggling with the challenges of ethnographic fieldwork and theoretical applications.

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