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## EDITORIAL

The following article was published in The American Journal of Distance Education last fall (Vol. 4 No. 2). I am grateful that both the authors and AJDE allow us to post it again in DEOSNEWS. Last fall, I conducted an audio conference where Elizabeth J. Burge answered questions about the following article. The experience showed that she has mastered both the theory and practice of audio conferencing.

### AUDIO-CONFERENCEING IN GRADUATE EDUCATION: A CASE STUDY

by Elizabeth J. Burge and Joan L. Howard

"The simplest delivery mode for distance education classes is audio only. It is also the most prevalent...Audio-only systems offer the interaction format most like the traditional classroom...(but the) novice instructor must learn new questioning techniques and protocols to overcome (the lack of visual cues)" (Ostendorf 1989, 8-9).

Virginia Ostendorf's indication that new skills are required by any instructor for audio-conferencing (AC) is correct, but we believe that use of those new skills by instructor and course participants should lead not to a replication of traditional teacher-directed lecture-style classrooms, but rather to a collaborative style characterized less by instruction than by facilitation, less by teacher talk than by student talk. Using Ostendorf's guiding spirit, we report as a case study our experience of AC that was designed to transform the dynamics of a teacher-directed classroom. In doing so, we use a learner-centered view (Brandes and Ginnes 1986; McLean 1987; Burge 1988; Burge and Howard 1990) to outline our conceptual and operational frameworks, report student reactions, identify what we have learned and suggest issues and research questions for the

future.

The Ontario Institute for Studies in Education (OISE) operates as the Graduate School of Education of the University of Toronto and, in addition to its teaching mandate, must fulfil province-wide research and field development mandates. This unusual triple function places demands not only for high quality programs and teaching but also for research and practice that is relevant for professionals involved in pre-adult and adult education. The added pressure from low levels of funding for Canadian higher education generally has meant that OISE's methods to achieve "campus-expansiveness" (Cross 1987) have had to be relatively inexpensive but of high quality. "Low tech for high touch," with due acknowledgement to Naisbitt (1982) became our watchword. OISE does, in fact, have a "high tech for high touch" process for off-campus classes; this process is computer mediated communication (CMC), using the conferencing system PARTICIPATE (Davie 1989; Harasim 1989).

This report focuses on student use of the comparatively low level technology of audio-conferencing. OISE, with a faculty of 162, has a total (full- and part-time) student enrollment of more than 2,000; of this total, approximately 500 part-time students live outside a ninety km radius of Toronto. OISE reaches these students in several ways: field-based faculty teach in a local Field Centre, while Toronto-based faculty travel to remote sites, or use either AC or CMC. The students involved are mostly elementary and secondary school principals, teachers, and administrators, with some adult educators and various community professionals, also. As graduate-level students, they are expected to know the theory and applications of their discipline, to competently and critically evaluate those theories and applications, synthesize issues, and-for thesis students-contribute to knowledge via research studies.

### The Course Context

Each student received a course manual designed to act as a "navigation guide" rather than as a transmitter of information, along with an agenda. The guiding function of the course manual refers to broadly stated learning objectives for each module or topic. Learning resources and activities include pre-class preparation in addition to in-class small group and large group activities. In addition, there is an extensive course bibliography, an introductory letter from the instructor, a generic set of guidelines for small group work and audio-conferences, and an

introduction to graduate level learning with learner's and instructor's responsibilities outlined. The class agendas distinguish three groupings of learner activity: small group work via bridging of various site groups (always without the professor listening in), whole class work without the instructor, and whole class work with the instructor present. The definition of class does not depend on the presence of the instructor, but the class is the aggregate of the students-into which the instructor makes certain interventions. We have tried to use every possible opportunity to encourage the learners to develop as a group that is interdependent with, not dependent upon, the instructor. This approach means helping the instructor to restrain her/himself from rescuing or from filling a thoughtful silence with words, to insist on students talking across the instructor to each other, and to confirm, correct, and challenge students as they work at the top three to four levels of Bloom's taxonomy-application, analysis, synthesis, and evaluation. All instructors are taught how to facilitate AC learning and moderate each session: OISE's distance learning designer is on hand during the early classes of a course to ensure that students and professor are "learning the ropes," growing comfortable, and building a relationship with the AC bridge operator.

All AC courses were subject to detailed evaluation by questionnaires sent to each participant. Closed questionnaire items sought rated assessments of the frequency and perceived quality of learning activities and resources. These assessments included ratings of workload, impact of library services, faculty feedback, effect of reduced visual cues, and adjustment to the AC mode. Open questions enabled respondents to explain their level of satisfaction with the course, to indicate the least and most successful aspects of the course, and to give advice on achieving effective AC and its moderation. Details about the general results are reported elsewhere (Burge and Howard, in press).

## Results

The data interpreted were drawn from the questionnaire returns for fourteen courses. One hundred and twenty questionnaires were analyzed; respondents on the average completed 80 percent of the fifty open and closed questions in each questionnaire. Five questions focussed on audio-conferencing. Response rates were significantly higher for the questions seeking general advice on moderating and improving the comfort level of AC for students. Generally, students reported satisfactory experiences with their

courses. For example, summing up their overall feelings of success in the course, students 'often' or 'almost always' felt successful (42 percent and 45 percent respectively) (Burge and Howard, in press).

Respondents were asked to specify what, if anything, helped them to feel comfortable and uncomfortable in using the AC equipment. A majority (56.9 percent) stated simply that increased familiarity with the equipment, from continued use, allowed them to become more comfortable with the medium: they "just got used to it." Some respondents (11.8 percent) credited their classmates who had prior experience with AC with helping them to adapt and feel at ease with the new mode of learning. The support and good humor within the class group created an atmosphere of trust in which the novice AC participants could relax, participate, and learn effectively. Comments related to technology comprised 13.7 percent of the total number of responses to this question. Students appreciated receiving help setting up equipment before a session, and, in particular, having a CN/CN staff person available. The availability of technical expertise and advice from a resource person and instructor made a great difference to some in their ability to be comfortable with AC technology. Of course, the absence of technical "glitches" and the fact that "it worked properly" were important factors.

On the other hand, many respondents confessed to feeling uncomfortable with the AC equipment and with the protocols for interaction via AC mode. One said, "for the first course I took I was downright intimidated and inhibited by the equipment." Specifically, the microphone was a stumbling block for many who found it "difficult to talk to an object" or who had trouble talking directly into the "mike." If the telephone lines degraded, or the equipment was not functioning well, disturbed on-line interactions kept participants from proceeding in a comfortable, relaxed atmosphere. Also, sometimes the chatter noise of other "teleconference experts" in the class made it difficult for the novice to feel comfortable. Many respondents reported they had trouble joining a discussion because they didn't know "when to jump in." Others felt stress (being "on the spot") when required to speak. Another student felt uncomfortable "not knowing whether each time I talk I am evaluated (or whether) the instructor is taping the responses."

Many suggestions were made to improve students' comfort with AC. A large number (48.8 percent) of responses referred to aspects of technical upgrade generally. Specifically, students recommended an easier, less frustrating microphone system: (1) improve the system so students "don't have to hold down the

button to talk"; (2) provide each student with a clip-on or around-the-neck style microphone as "sharing is sometimes awkward"; or (3) install an omni-directional microphone for whole class discussions. Calls for a better response system and some form of speakers' protocol reflected students' concerns about "jumping in," interjecting, and questioning as discussions were in progress.

The lack of visual cues in the AC classroom presented a difficult challenge to many students. Some suggested using video-cassettes or preferably some form of personal contact between instructor and students at various local sites, i.e. "make sure both groups meet each other face-to-face at least once early in the course." As an alternative to a face-to-face meeting, one respondent suggested that a brief biography and photo of each student at other course sites could "encourage a 'getting to know you' feeling" and thus make the entire class a more cohesive, friendly, and supportive group. The need to create a friendly "ambiance" and a recognition that "humor helps" was frequently expressed in suggestions for some informal contact time and some lighthearted banter.

Among a number of suggestions related directly to the attitudes and abilities of students themselves were: learn to speak slowly and clearly, keep individual presentations brief and concise, don't ramble on and squander valuable air time, and come well prepared to each class. Other suggestions were directed to the instructor: give time to reflect; think about additions and interjections; use on-line time efficiently-don't waste it making housekeeping decisions; allow time to work together off-line as a group before joining other groups on-line; provide plenty of feedback; organize and clarify response procedures by naming sites or individuals, or having a pre-arranged response sequence; be a dynamic facilitator.

Advice for the chair or moderator of AC was plentiful. In fact, twice as many codable comments were made in response to this question as compared to any other AC question. More than half of those comments related to the facilitation skills of the instructor and the interpersonal dynamics of the AC classroom. Moderators were first advised to develop a personal rapport with students: use first names to encourage individual students to speak, especially those who never speak because they are not assertive; "ask specific people specific questions" to avoid monopoly of air time; and allow for some friendly chit chat and personal interaction that "makes us feel significant in some way." Feedback, especially positive feedback, is important to many respondents. Don't forget, students reminded us that "nice

comments give confidence."

The moderator must also maintain firm control of the discussion. He or she must continually focus on the topic, monitor the length of responses (cutting off "people who ramble on," if necessary), clarify student responses, provide additional information wherever possible, and repeat, clarify, summarize, and confirm understanding before continuing.

The second largest group of comments reflected students' need for clear planning and organization by the moderator with regard to logistics of equipment use and maintenance, as well as time management. Advance organization at the local site should be a priority for a moderator; this includes verifying all equipment and connections, checking sound quality before the class session, and knowing how to operate all the equipment. Inexperience was not seen by respondents as an excuse for technical slip ups: advance planning and practice were seen as obligatory. Even more important than technology management was time management (and by implication, productivity). Some respondents thus advised: "Save discussions of personal papers for personal calls, or at the break"; also "having (a pre-planned) agenda and questions to prepare for class gave us an opportunity to have material ready and be able to contribute to class discussion." Some respondents spoke highly of one instructor's practice of allowing "time off the air for students to discuss and to prepare as a group..." (This practice was, in fact, well used by most instructors.) Another respondent claimed that "reporting results of small group discussions is more effective than conducting a discussion on-line." Another thought that the instructor should not "feel threatened by the occasional silence" and that the "energy level, 6-9 p.m., is very low for most people-don't be discouraged by quiet spells."

Students advised the hypothetical moderator to plan and organize course materials and AC class procedures carefully: ensure that the course manual would include a variety of print formats (activity sheets, reference material, documents, graphs); use a variety of activities for individual, pair, or small group work; vary assignment types and reporting techniques; break up long blocks of presentation time with small group and/or individual activities; and be flexible in response to spontaneous interactions or events. We conclude that respondents were looking for facilitative approaches to learning and to teacher-student interaction, and for quality course materials and learner-centered activities. Much of the advice for a moderator and many of the suggestions for course improvement were, in fact, being implemented across courses, and we suspect that some advice

and suggestions were based on recall of novice behaviors of faculty and students alike. Other comments, we suspect, were made as generic suggestions regardless of the student's immediate AC experience.

The effects of the AC context on various internal and external-to-the-learner learning processes were probed in the last closed question. The question was exploratory since we had seen no similar question either discussed by our peers or used in actual instruments. We wanted to discover if students felt the AC was inhibiting across all major class dynamics and learning processes, as some of our colleagues had informally predicted. Respondents were asked to rate the effect of reduced visual cues on seventeen affective and cognitive, intrapersonal and interpersonal learning processes. The items examined included specific learning skills, aspects of group dynamics, and interactive relationships with peers and the instructor. The items were originally listed in random order; however, for reporting purposes the items were regrouped so that the response patterns are more readily apparent. Given was a choice of four options: facilitative, no discernible effect, inhibiting, and not sure (results appear in Table 1).

Table 1. Students' perceptions of the effects of the absence of visual cues in AC on aspects of learning

	Facili- tating effects	No Dis- cernible	Inhibi- ting	Not sure
Learning Skills				
Understanding the ideas of other students	3.5%	55.8%	37.2%	3.5%
Understanding what the instructor was saying	4.4	69.0	21.1	4.5
How much I learned overall	10.5	62.3	15.8	11.4
Generating ideas	6.1	61.7	31.3	0.9
Solving problems	6.0	61.5	29.1	3.4
Critically assessing	17.1	56.0	25.9	1.0

my experience

### Interactive Technology

Reducing distractions	26.1	34.0	33.8	6.1
Focusing my attention to the task	15.5	32.0	49.1	3.4
Feeling able to interrupt	5.2	20.9	70.4	3.5
Knowing what others thought of what I said	5.2	21.6	69.8	3.4
Synchronizing responses in free discussions	4.3	25.0	63.8	6.9
Taking turns at talking	18.9	38.8	38.0	4.3

### Group Dynamics

Feeling included in group/class	13.9	33.1	47.8	5.2
Feeling able to joke and have some fun	12.0	47.0	31.6	9.4
Feeling that others respected my contributions	24.4	32.8	37.0	5.8

### Relationships

Developing social relationships	12.8	38.4	44.0	4.8
Getting to know the instructor	5.9	32.5	55.6	6.0

The first group of items is related to key internal learning processes. For each one of these processes, both receptive and productive, the majority responses indicated the absence of visual cues had "no discernible effect" on the respondent's ability to comprehend subject matter, respond critically and creatively, and generate ideas. In fact, in five of the six

cases, the response rate for "no discernible effect" was more than twice the response rate for "inhibiting." Only in the first item, "understanding the ideas of others," was the margin of difference somewhat smaller with 55.8 percent reporting no effect while 37.2 percent were inhibited.

The second group of items referred to aspects of external interactive processes. Here the responses were not reassuring. As one might expect from students' comments discussed earlier, the responses reflect students' concerns and difficulties with interpersonal communications. For four of the six items, students found the absence of visual cues to be inhibiting. Certainly students felt inhibited in interrupting an AC conversation in progress (70.4 percent), also in synchronizing their responses during the flow of discussion (63.8 percent). They were often not able to know what other participants thought about their contributions (69.8 percent). Respondents reported less difficulty with turn taking, with almost equal numbers finding themselves to be unaffected by the absence of visual cues (38.8 percent) as found themselves to be inhibited (38.0 percent). Similarly, responses were spread evenly for the first item, "reducing distractions," where over one quarter of respondents (26.1 percent) in fact found the AC mode was facilitative in reducing distractions.

Assessments relevant to the third and fourth groups of items-group dynamics and relationships-showed a more even distribution over the response categories. Some respondents noted that the absence of visual cues had no effect on their feelings of inclusion in the group nor on their feelings of confidence that their contribution was respected by others in the group (33.1 percent and 32.8 percent). A larger group, however, felt inhibited in both areas (47.8 percent and 37.0 percent respectively). Regarding feeling free to joke and have fun, more respondents were unaffected by AC than were inhibited by it (47.0 percent and 31.6 percent respectively). Some respondents considered social relationships difficult to establish in AC without visual cues: 44.0 percent claimed to be inhibited, but 38.4 percent reported AC as having no effect. Getting to know the instructor was more difficult for 55.6 percent while 32.5 percent reported no difference.

Clearly, more investigations should be carried out to determine user reactions to the absence of visual cues, but we believe our modest exploration shows at least one interesting result and allows us to ask several questions. The chief result appears to be that while a clear majority of students felt AC to be inhibiting in terms of getting feedback from others, interrupting others, and synchronizing responses in free discussions, they did

not feel any discernible effects of AC on their more internal learning processes—understanding instructor input, generating ideas, solving problems, and critically assessing their experience. This result matches research done elsewhere (Williams and Chapanis 1976). In terms of how much students learned overall, not only did a clear majority feel no effects, but 10.5 percent of respondents also indicated facilitative effects of AC. To find adequate explanations for the results would require new questions, an improved instrument, and some qualitative methods of data collection and analysis. The following are some questions for such a study: If technically the AC equipment could ensure easy interruptions and the synchronizing of discussions, might students increase their skills in giving verbal feedback, both affective and cognitive? Would the "No discernible effects" results for the internal learning processes be then significantly affected? Would the students actually interrupt or "jump in," or do they just want to know they can if they need to? To what extent can the absence of visual cues account for the results concerning relationships, inclusion, and focussing attention to task? Would we see any significant gender-based differences in responses given that women are traditionally socialized into certain styles and functions of conversation? How important are human relationships in audio-based classes and how should they be nurtured? How would the responses vary according to the teaching model used by the instructor?

## Conclusions

Responses from students in this case study of graduate-level AC learning are of course not generalizable, but they give us cause to reflect on how to help students use the medium interdependently and assertively. Students in general were satisfied with their courses and with their learning experiences via AC. They indicated a willingness to accept new forms of organization of all the necessary components, namely, resources, small and large group activities, time allocation, variety in activity, and changed instructor-student relationships. Most students quickly got used to the AC equipment procedures without undue stress. Also, most students were not adversely affected by the absence of visual cues. Our initial assumptions were proven correct.

Respondents were very clear about their requirements for what we term productivity and technology management, and those requirements focus as much on peer behavior and technology perform-

ance as they do on the instructor's attitudes and skills. Our student comments came out of a particular context-one that was structured to avoid on-line lecturing and to promote student-to-student interactions on and off-line with confirming, challenging, and correcting interventions by the instructor. What was important here was not the "design of the educational message" (Moore 1988, 6 and 7), because these graduate students had to create their own substantive dialogues; the challenge was to create the interactive conditions for feeling and being successful. This interdependence model for delivery is not, in our experience, widespread in distance education. Our students' admonitions for instructors to be "personal," to keep control, and to give feedback were not unexpected and are a major part of the "how-to-AC" manuals. What was less expected, however, were their requests for their peers to have good presentation and communication skills.

While this case study has too many contextual limitations and variables between courses for adequate comparison with experience elsewhere, it does remind us of several key points. Students understand and accept the need for a balancing act: the facilitator maintains a fine balance between being quiet to enable informal "thinking talk" and being authoritative in terms of confirming and correcting learning, connecting students to resources, and challenging them to further critical and creative heights; all AC participants maintain a balance between holding their listeners' attention and dominating the discussion to the exclusion of others. These students remind us that because of the reduced visual cues attention must be paid to the interactive courtesies of a quiet and attentive classroom and to local site group dynamics so that participants can join in an ordered sequence of speakers without feeling the pressure of having to interrupt. Furthermore, affective elements are as important in the AC classroom as they are in the traditional classroom. Friendly behavior, a relaxed atmosphere, and some casual banter and humor go a long way to ease the tension and frustration felt by many in new learning conditions.

We indicated earlier several questions deserving further research attention that have emerged from the analysis of data in this exploratory case study. The instrument used, although modest, appears to be unique in its examination of the interactive relationships in the AC classroom and in the exploration of one of its chief characteristics, the absence of visual cues. Further investigations must more fully explore that characteristic as well as others-for example, spontaneity, pacing, organization-that will help the graduate learner to evaluate

information, synthesize issues, analyze his or her professional experience, articulate findings and, finally, develop new knowledge.

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