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Collaborative Distance Learning via Desktop Videoconferencing

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ABSTRACT

Desktop videoconferencing (DVC) with fully interactive collaboration software has recently emerged as a viable communication medium. These systems incorporate multiple collaboration technologies (e.g., voice, video, a mutually controllable shared software screen via dynamic data sharing) into a familiar and integrated desktop environment (i.e., windows-based personal computer). The designers of this technology are promoting it as a key enabler to support distributed teams of knowledge workers in network organizations (*Forbes* 1993). It is also being promoted as a vehicle to deliver collaborative distance learning (*Business Week* 1994). We report on an experiment which assessed the efficacy of DVC for enabling collaborative distance learning. Since collaborative learning requires rich interaction between learners, it was hypothesized that face-to-face teams would exhibit greater learning and satisfaction than nonproximate teams which communicated via DVC.

The research methodology was a field experiment employing a quasi-experimental interrupted time-series design with nonequivalent control teams (Cook and Campbell 1979). The primary treatment (nonproximate distant, ND) was based on the *primary* role envisioned for desktop videoconferencing — collaboration between geographically distant parties. The measures from the primary treatment were assessed via planned comparisons against two smaller baseline treatments which represented alternate uses of the technology (nonproximate local, NL, e.g., different rooms in the same building) and a traditional face-to-face format (proximate local, FtF). Four person MBA student teams comprised of a dyad from the University of Maryland and a dyad from Indiana University worked on a three-part business case for the ND treatment. Maryland MBA students worked in pairs of dyads to perform the same case for the NL and FtF treatments. The case was about a manufacturer-distributor relationship in the grocery and had a separate version of the case for each company. Each dyad in a team received only one version of the case, thus each dyad had the opportunity to learn about the other version of the case through the collaborative learning sessions. The assignments for the three structured sessions necessitated information sharing and course-relevant analysis. The three scheduled sessions were sequenced at three week intervals due to rotation constraints. T-tests revealed no demographic differences between the subjects in terms of age, work experience, or self-reported computer skills.

Both nonproximate treatments communicated entirely through the DVC systems and a shared spreadsheet template was provided for task support. The two PCs were connected via ISDN lines. The systems allowed the users complete control to the extent to which their screens were devoted to videoconferencing, sharing the collaborative spreadsheet, or some combination of these. The FtF dyads sat across a table from each other and had access to the same shared spreadsheet for task support. Learning assessments were conducted at two levels. The first was a rote-level factual learning from the case. The hidden-profile nature of the cases allowed for pre- and post-session quizzes regard the task-relevant facts. A second measure of higher order learning was assessed during the third session. Satisfaction with the outcome and process were also assessed.

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Planned comparisons contrasted the ND teams against each baseline treatment. In summary, there were no statistical differences in factual learning between the ND teams and either the NL or FtF teams. The critical thinking assessment in session 3, however, found that the ND teams did better ($p < .05$) than teams in either of the other treatments. There were no statistically significant differences for satisfaction. Thus, the hypotheses were rejected.

This field experiment marked a first step in assessing the potential role of DVC for collaborative distance learning. Students praised the system's mutually controllable shared software environment for the task focus which it gave to their interactions. The experimenters observed the students adapting the use of screen space (e.g., video or spreadsheet) to the changing topic of interaction (e.g., social behavior for team building, information sharing, persuasion, etc.). The higher critical thinking scores for the ND teams were likely derived from the rich technology-enabled access to the different perspectives provided by the distant team members. The presentation at the conference will include additional details and analyses from the study.

REFERENCES

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