

## Chapter XVII

# The Impact of Multimedia Videoconferencing on Children's Learning: Positive Outcomes of Use

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### ABSTRACT

*The use of videoconferencing as a means of bringing external informal educators into the K-12 classroom is an area of increasing interest in the field of education. To date, however, few studies have documented the impact of the process on students' cognitive and affective outcomes. This chapter presents findings from a series of studies that compared student outcomes for those who received technology-supported videoconferencing with those who did not receive videoconferencing. Findings indicate that students who participated in videoconferencing had higher scores on cognitive indicators, were more motivated to learn the material, and were more interested in learning about related topics.*

### INTRODUCTION

Weiss (1998) found that 88% of museums already have resources available that could provide K-12 educational settings with programming that was directly related to school-based needs. Several studies (Greenwood, 1998; Sembor, 1997; Speltz & Shaugnessy, 1990) have found that coordinating provider materials with state and national learning

standards allows external educators to offer even more information and resources to K-12 users. Jonassen (2002) noted that teachers could become more effective in breaking down the barriers of learning associated with traditional classroom instruction if they would incorporate these resources into their teaching. Many districts, however, are not able to take advantage of these opportunities if their students must be transported to the pro-

vider; this is especially true for districts that are economically disadvantaged or where security is an issue. As a result, both content providers and educators have begun to look for alternate means of bridging the gap between the K-12 classroom and external expert providers (Cavanaugh, 2001). One method that appears to have potential is the use of videoconferencing.

Videoconferencing has been defined as “a live connection between people in separate locations for the purpose of communication, usually involving audio and often text as well as video” (Tufts University: Educational Media Center, n.d., Glossary). Unlike many other forms of online communication, videoconferencing requires the participants’ real-time physical presence to communicate with learners at distant sites. Proponents of the medium believe that using videoconferencing in the classroom community has many advantages. One of the benefits of videoconferencing rests in its capacity to import external resources to the classroom via advanced technology (Motamedi, 2001). In addition, it is believed that videoconferencing can better accommodate communities of diverse learning styles than do other online tools in which instructional strategies may be asynchronously mismatched with learners’ needs. In fact, many state that it is the interactive element of videoconferencing that is the real key to its success when combined with well-planned, student-centered instruction (Greenberg, 2004; Omatseye, 1999).

A great deal of research has been conducted on how students react to online computer or Web-supported learning (Bennet, 2002; Windschitl & Sahl, 2002), but very little scientifically-based information is available to support the impact of videoconferencing between K-12 learners and external experts. Early research on videoconferencing and student learning yielded mixed results, at best. According to Speltz and Shaugnessy (1990), a clear understanding of student needs with a direct tie to classroom objectives was needed by providers for a successful “visit” to be achieved.

Similar results were found by Furst-Bowe (1997), who reported no differences in student reactions when piloting videoconferencing, unless instructors received training in appropriate use and materials were integrated into and supported current instruction. Gernstein (2000) also found that if videoconferencing was tied to the curriculum, it would increase student motivation. Additionally, Gernstein noted that higher levels of discussion were yielded when videoconferencing was supported by inquiry-based activities. In the majority of these studies, however, major limitations can be noted; first and foremost, because the studies were conducted independently, sample sizes were either small or limited to a particular setting, provider, or grade level. Consistent variables, which would allow for aggregation, also were not used across studies. In addition, in most cases, multiple methods of assessing impact were not used, nor were follow-up studies conducted to assess long-term outcomes.

A similar lack of clarity can be found when examining early research on the impact of videoconferencing and support for educational reform. Although Cochrane (1996) and Badenhorst and Axmann (2002) indicate that videoconferencing between geographically-distanced sites eliminated travel time and reduced costs affiliated with physical field trips, they offer no scientifically-based evidence of how the process can assist schools in meeting state and national learning standards, mandated testing, or support programs that have advanced learning and problem-solving as part of their objectives. Freeman (1998), Knipe and Lee (2002), Pachnowski (2002), and Peterson (1998) provided limited evidence of support for inquiry-based learning and enrichment of resources, but again methodological independence does not allow for generalization to alternate settings, providers, and programs, nor are long-term perceptions assessed.

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