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HOW TELEPRESENCE TECHNOLOGY CAN IMPROVE ACCESS TO ADVANCED, HIGH SCHOOL COURSES

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Telepresence technologies, such as videoconferencing equipment and educational tools like Google Classroom, facilitate distance learning and collaboration. Newer telepresence learning systems utilize high-end videoconferencing to mimic traditional classroom experiences and facilitate two-way communication in real-time. School districts can leverage this technology to increase student access to courses that would not otherwise be available to them, particularly Advanced Placement (AP) and other advanced or elective courses. Access to these courses, made possible by these technologies, can expand student access to rich learning experiences and to opportunities to earn college credit.

This study highlights students' learning outcomes and experiences when enrolled in one or more telepresence courses within a large, urban school district that has been working to implement telepresence learning over the last three years. Based on the analysis of student and teacher surveys, classroom observations, and student record data, it is evident that students enrolled in telepresence courses, on average, took more AP courses, were absent less frequently, and scored higher on the ACT. The initial challenges and successes experienced in the district we studied provide a roadmap for school districts and policymakers interested in leveraging technology to expand learning opportunities for students attending schools with limited resources.

A CASE STUDY OF HIGH SCHOOL TELEPRESENCE COURSES

The district used site-to-site specialized cameras and wide screen interactive monitors to facilitate instructor-student interactions similar to the face-to-face interactions that occur in traditional high school classrooms. Students and teachers also used Google Hangouts in class to communicate electronically through video chat and messaging. To encourage cross-school collaboration, facilitators arranged for field trips and Saturday study sessions throughout the semester. Teachers volunteered for training, initially provided by the company providing the equipment for these courses. District facilitators later took over the training responsibility, offering professional learning every other month. A dedicated district support person organized social gatherings for telepresence teachers and facilitated an online group to share successes and provide updates.

During the classroom observations, teachers encouraged cross-school interactions by requiring students to call on peers from another school by name or comment on responses of at least two other students via Google Classroom. Students participated either on-site, at the same school as the primary teacher, or remotely, in classrooms at different schools across the district. Both set of students benefited from the increased use of technology to facilitate interactivity and communication. Additionally, there was often an insufficient number of students to offer the courses in a more traditional, face-to-face class setting in any given school. By combining enrollments across schools, students at both sites could participate in courses that might not otherwise be offered. At remote sites, teacher aides and classroom assistants helped support student learning. The aides had responsibilities like communicating the "temp of the room" to the primary teacher, assisting with technical difficulties and classroom management, and participating in group instructional activities with the students participating remotely.

Students who participated remotely and on-site conveyed generally favorable experiences. Ninety-three percent of all participating students agreed or strongly agreed that the teacher encouraged

them to participate, and around three-fourths agreed or strongly agreed that the telepresence technology facilitated interactions with remote classmates. Remote students were slightly less likely to agree with these statements. Both students who participated remotely and on-site appreciated the opportunities to take advanced coursework otherwise not offered and to learn with students from other schools. While generally very appreciative of the opportunity to teach via telepresence, teachers suggested that providing a stipend to compensate telepresence teachers for additional work and for organizing collaboration opportunities could help to improve the program and teacher recruitment in subsequent years. Based on this feedback, in the most recent school year, the district allocated funds for up to four hours of additional pay per pay period to acknowledge the extra preparation time they used for telepresence.

Telepresence courses improved student access to advanced courses, specifically AP courses. Students who attended schools offering telepresence courses either on-site or remotely enrolled in more AP courses than students attending schools who did not offer telepresence. This is likely because without the telepresence courses, schools would not have been able to offer the AP courses due to insufficient enrollment at any individual school. More specifically, participating students enrolled in one or two more AP courses in the years they enrolled in a telepresence course compared to years in which they did not enroll in a telepresence course. Many, if not most, AP telepresence courses represented an AP course in which a student would otherwise not have enrolled.

Remote and on-site students in a telepresence courses achieved comparable gains on standardized test scores in years when they participated. However, students participating in telepresence courses remotely (versus those not enrolled in a telepresence course) had about two percent reduction in days absent. Participating students also scored approximately two points higher on the ACT than similar students who did not participate. We observed these gains consistently across racial, ethnic, and socioeconomic subgroups.

The district also attempted to initiate a telepresence partnership with a rural district in the state, but different school schedules limited the potential for expanding the program.

Policy Recommendations for Policymakers and Schools

Telepresence technology is a viable option for increasing student opportunities to take advanced courses in high school. Students who participated in these courses enrolled in more AP courses through telepresence, were absent less frequently, and scored higher on the ACT. We suggest the following strategies to leverage telepresence technologies to improve student learning.

- Partner with technology vendors and local community agencies, where possible, to gain access to telepresence technologies and training.
- Support robust professional development, best-practice sharing among instructors, and relationship building between teachers and students across classrooms and outside the school day.
- Identify a dedicated district employee to support the telepresence program. Responsibilities may include supporting teachers, visiting schools, helping with the decimation of best practices, organizing professional development, planning and chaperoning field trips.
- Hire teacher aides and classroom support staff to ensure that students participating remotely have adequate support and, if needed, someone to advocate for them.
- Provide students with resources to access instructional materials outside of school to prevent lack of access to technology and Internet connectivity at home from limiting learning opportunities.
- Integrate on-call technical support to prevent technology challenges from limiting instructional time.

Read more at Jennifer Darling-Aduana and Carolyn Heinrich, “The potential of telepresence for increasing advanced course access in high schools,” forthcoming in Educational Researcher.