A Training Tool to Help Teachers Recognize and Reduce Bias in Their Classroom Behaviors and Increase Interpersonal Competence

Cornell University

Yeonju Jang, Hyunju Kim, Jonathan Segal, Cheng Yao Wang, Aleshia Taylor Hayes, Susan Fussell, Andrea Stevenson Won
Cornell Virtual Embodiment Lab

Virtual Embodiment Lab

Introduction

What teachers say is important, but how they say it is also important. Nonverbal behavior can unintentionally convey information about teachers' emotional states and personal biases, that damages teachers' abilities to deliver lessons, assess students, and manage classrooms. Effective nonverbal communication increases student engagement, improves classroom management, and makes students feel that the teacher cares about them. Students with teachers who communicate effectively with their nonverbal behaviors are more motivated to learn and demonstrate more academic progress.

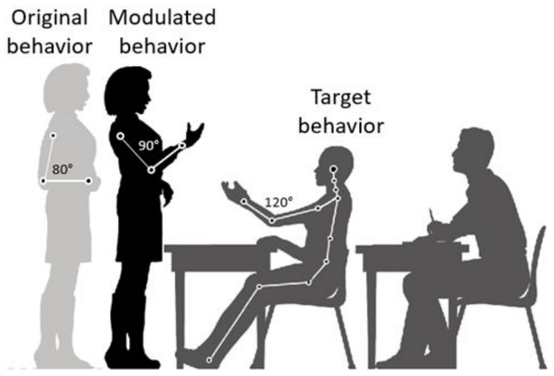
Nonverbal communication is a skill that can be improved with guidance and reflection. This project will first 1) suggest evaluation tools for students, teachers, and coders to understand nonverbal behaviors of teachers and 2) compare teachers' nonverbal behaviors with transformed nonverbal behaviors that would effectively engage students.

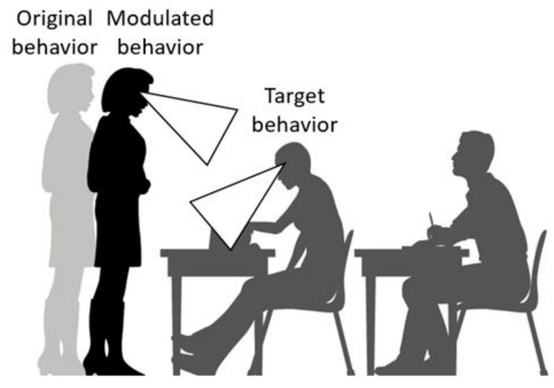
Research Plan 1. Reconstructing Teacher's Nonverbal Behaviors with Immersive Environments

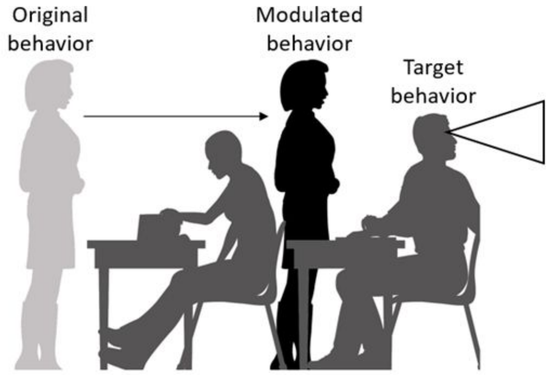
In an immersive environment, users have the potential to observe and convey nonverbal behavior and identity information (Ratan & Hasler, 2010) in ways that can replicate or enhance face-to-face settings. We propose reconstructing nonverbal behaviors in a teaching context to visualize in 3D immersive environments.

This tool is expected to enhance the understanding of teachers' nonverbal behaviors in three different ways. First, it provides a video of interactions between teachers and students in virtual humans so that their appearances are standardized. The standardization could reduce biases in evaluating nonverbal interactions of teachers with multiple students. Moreover, this tool enables evaluators to move their viewing position to clearly observe interactions with students in different positions. The movability of the viewing position permits our project to address one-to-many communication between teacher and students, going beyond the dyadic interaction that the vast majority of previous studies have examined. Finally, 3D reconstructed interactions can present measured values of nonverbal behaviors, such as gaze or proximity. Such values can provide evaluators with abundant information about nonverbal communication between a teacher and students that are less available using 2D videos. In addition, the values can be used as a label that evaluators utilize to find the interaction of a teacher with a specific student.

We will compare how this tool influences the understanding of three different evaluators, teacher, student, and 3rd party, on teachers' nonverbal behaviors in classrooms.







Research Plan 2. Designing Transformative Experiences

After a teaching interaction, teacher participants will "re-experience" their teaching and observe both their actual behavior and the transformation as suggested by the system. Through a process of user feedback and reflection, we will investigate how users prefer to use such tools to manage their own self-presentation, and how they prefer to receive feedback from their teammates. We will then design interventions to enhance nonverbal immediacy, social presence, and self-efficacy for student teachers, with the aim of improving student outcomes in XR and face-to-face teaching, as measured by student learning, engagement, and satisfaction.

We categorize the effects of teacher behavior on student behavior in three ways. First, there are some types of behavior in which teacher and student movements could ideally be *similar*; i.e., achieving ***nonverbal synchrony***. In these cases, teacher behavior could be rendered to more closely match student behavior; for example, by adjusting the angles of the joints of the upper limbs and torso of the teacher avatar by a certain percentage of the angles of the joints of the upper limbs and torso of the student avatars. Second, there are categories in which teacher and student behavior could ideally be *inverse*--for example, if a student is disengaged, which could be discerned by their posture and the angle of their head, or even simply by the direction of their gaze. The teacher might need to modulate how they distribute their ***gaze***, or the percentage of time during which they look at that particular student in order to re-engage them. Third are categories in which student and teacher behavior may be *contingent* yet *the behaviors themselves are dissimilar*; for example, when a student indicates through their posture or gaze that they are disengaged or distracted, for example, looking away from the front of the classroom or fidgeting. This might mean that the teacher should adjust their ***proximity***, moving closer to the student.

Literature Cited

Ratan, R., & Hasler, B. S. (2010). Exploring self-presence in collaborative virtual teams. PsychNology Journal, 8(1).

Acknowledgments and Implications

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