

Preservice Teacher Noticing and Perceptual Capacity with 360 Video and VR Headsets

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Abstract. The use of video is prevalent in teacher education. it has been shown to be successful in varied content areas, with multiple contexts, and for differing audiences. Even with its successes, there are several known challenges with capturing and using classroom video to inform teacher professional development and preservice teacher education. To address these issues, drawing on a grant from the National Science Foundation, we have created an extended reality initiative (XRI) that provides information about equipment, software tools to edit single and multi-perspective videos, and a collection of videos for instant use in preservice and in-service classrooms. In addition to the deliverable outcomes, the project has shown that 360 and VR can improve preservice teacher noticing through increased perceptual capacity.

Introduction

Videos have been used in teacher education for several decades (Gaudin & Chaliès, 2015). The use of video has included both in-service and pre-service teacher professional development. It has focused on learning pedagogical strategies, knowledge, attitudes, and skills. In some states, video has become so important that current and future teachers must use it to demonstrate competency for licensure or certification. The use of video has been found to be important to learning in teacher education across multiple content areas and within multiple contexts. For instance, it can be used by student teachers for reflection, by supervising teachers for providing feedback, and by mentor teachers in post-observation conferences. In sum, video has successfully been used in teacher education and does not seem to be going anywhere soon.

With all these positives, there are several challenges and limitations with the use of video. For instance, it can be difficult to hear student and teacher voices with video. Videos often fail to capture everything—or the right things—that are happening in the room. And, most notably, videos are always taken from the perspective of the camera (e.g., wherever it is pointed) (Ferdig & Kosko, under review).

Digital innovations have attempted to address these limitations. For instance, there are better cameras and better microphones, there are cameras that follow teachers as they walk around the room, and there are software tools to let viewers select or capture segments within the video that they deem important. Some have responded to these limitations by attempting to capitalize on the benefits of video without using traditional video. These efforts have included animation, virtual reality, and simulated classrooms. Again, each of these new products have had some

limited success. However, costs of production and singular perspectives on where the video points have continued to plague many of these efforts.

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To address these issues, we have implemented a 360 and VR headset solution for the teacher education preservice classroom. The 360 technology offers incredibly cost-effective ways to install multiple, small cameras in K-12 classrooms that can easily record or livestream to preservice classrooms (Reyna, 2018; Roche & Gal-Petitfaux, 2017). Rather than trying to engage with professional setups to record preplanned videos, these tools can be setup within seconds and can record with the click of a button. Our experience suggests that cameras as cheap as \$100 and headsets as cheap as \$5 can recreate a professional learning experience for in-service and preservice teachers.

In this poster demonstration, users will have the opportunity to learn about 3 key outcomes while they try out the hardware and software.

1. *Equipment testing.* Through work funded in part by a grant from the National Science Foundation, we were able to purchase and test several camera, microphone, and headset solutions. Poster viewers will have the chance to see an overview of the options necessary to produce or view 360 videos for classroom practice from both single and multi-perspective foci. Those wishing to engage with the technology will have the chance to try out low cost and medium cost solutions to test fidelity.
2. *XRI project.* Through work funded in part by a grant from the National Science Foundation, an extended reality initiative (XRI) has been created. Attendees will have a chance to learn about the products freely available through the project. Those products include, but are not limited to, multi-perspective video editing software (that currently only exists in limited format in the commercial market) and a collection of videos that can be immediately implemented for users who do not want to create their own video.
3. *Research findings.* Through work funded in part by a grant from the National Science Foundation, research has been conducted on the use of 360 video in preservice classrooms. Although work will continue for the next two years, participants will have the opportunity to learn about: a) a measurement scale to test presence in 360 video; b) investigations into single and multi-perspective videos; and, c) the role of 360 video in improving preservice teacher noticing through increased perceptual capacity (Ferdig & Kosko, under review; Amador et al., 2017; Brunvand & Fishman; 2007; Choppin, 2011; Weston et al., 2018).

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