Lessons learned from conducting virtual Pre-K CLASS observations in centers and family child care homes during the COVID-19 pandemic

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Overview and key findings

/ We conducted virtual observations in pre-K classrooms to understand if using video streaming technology instead of an in-person observer is practical to assess classroom quality across centers and family child care homes (FCCs) in urban and rural settings.

/ Conducting virtual observations using the Pre-K Classroom Assessment Scoring System (CLASS) was practical in both centers and FCCs; however, doing so comes with substantial logistical challenges.

/ We share lessons learned for researchers or state agency staff considering virtual observations in pre-K settings.

Introduction

In-person observations have traditionally been the standard approach to classroom observations. In these scenarios, one or two observers go into the classroom to measure aspects of the classroom environment. However, conducting virtual classroom observations for research, monitoring, and quality improvement might be a more efficient approach to observations. Virtual observations reduce travel time and offer more flexibility for scheduling and hiring the staff needed to conduct the observation. To explore the practicality of conducting virtual pre-K observations, Mathematica, in partnership with Oregon's Early Learning Division, and with support from the Bill & Melinda Gates Foundation, conducted a pilot study of virtual observations using the Pre-K Classroom Assessment Scoring System (Pre-K CLASS) in Oregon during the 2021–2022 program year. Based on these observations, we describe recommendations for researchers and state agency staff considering whether and how to conduct virtual pre-K classroom observations.

We present recommendations in three areas based on lessons learned in conducting the observations: (1) technology and equipment setup, (2) data collection, and (3) planning and logistics. First, we provide a brief overview of the observation methods and tools we used to conduct observations virtually.

Observation methods and tools

To assess whether virtual observations are practical in different setting types and communities, we conducted the virtual observations at eight provider sites—four Head Start centers and four family child care homes (FCCs). We conducted these observations in both rural and urban geographical areas. For each provider, we

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[1] The first two authors contributed equally to the writing of this brief.

asked the staff to designate one staff person to serve as the technology liaison. We then worked with this liaison to set up the technology used to conduct the observations.

For each observation, we used Swivl, a video and audio recording tool. We sent each provider a Swivl kit, which included two main components: (1) a robot base with a mounted camera that rotates 360 degrees and (2) a tracking device called a marker that the lead teacher wears on a lanyard and to which the camera connects, allowing the camera to track the teacher around the room (Exhibit A). The marker has a built-in microphone that enables the observation team to hear audio. We also sent four cell phones with each kit to be used as cameras. One of the cell phones was mounted on the Swivl device, and the other three phones were mounted on traditional tripods. To connect the observation team to the classroom, each cell phone was connected to a secure Zoom meeting to live stream the observation.

The Mathematica observation team included two observers certified in the Pre-K CLASS. The observers were equipped with a laptop, an external monitor measuring about 20 inches or more for better viewing of multiple camera angles in Zoom, and an electronic version of the Pre-K CLASS to be used for scoring. The observers logged in remotely to the classroom observation live stream.

Exhibit A. Swivl technology

| Swivl robot | Swivl marker | Cellphone on tripods |

Recommendations and lessons learned

The following recommendations are based on our experiences conducting these pilot observations.

Technology and equipment setup

Place the devices such that the primary areas of instruction in the classroom are visible. The Swivl device rotates but it does not move from its location. Because of this, users must consider placing the device and any additional cameras so that all primary areas of instruction in the classroom are visible. The Swivl will not be able to track teachers during activities that take place across multiple rooms, as it cannot follow them if they leave the room where the device is set up.

The Swivl, mounted on a tripod, should be centrally located within the observation area to allow full rotation with an unobstructed view. Placement close to obstructions such as a wall, window, or whiteboard can interfere with the Swivl's ability to track the marker on the teacher. The cameras should be angled to capture the children at their level. Potential approaches include angling the cell phones and Swivl mounts downward or

using the wide-angle feature on the cell phone cameras to capture more of the room. FCCs often have smaller spaces, aligned with the fewer number of children typically enrolled. In FCCs, even if you are not able to place the Swivl 6 to 15 feet from the person wearing the marker as the instructions recommend, place the cameras so that they capture the entire observation area. For areas where the most activity will take place or commonly used areas, consider using additional cell phones at complementary angles so observers can see the faces of both staff and children.

Consider the space when planning camera needs and try to get a floor plan in advance. The number of cameras needed to successfully conduct the observation will depend on the size of the observation space and the setup of the classroom (see Exhibit B for an example setup). If classrooms have separate learning areas, it might be challenging to obtain clear lines of sight for the virtual observation. Before the day of the observation, we recommend reviewing the floor plan of the classroom with the technology liaison and offering suggestions on optimal camera placement in the classroom. Receiving a floor plan of the classroom or photos of where classroom activities take place ahead of the virtual observation can also help observers orient themselves to the classroom.

Exhibit B. Example classroom setup

Provide guidance to teachers about who should wear the marker to capture best sound quality. The teacher actively instructing the class should test wearing the Swivl marker before the observation begins so the observers can test the sound quality and make necessary adjustments. For example, a teacher might need to remove a lanyard or other items hanging from their neck that could interfere with the marker.

Before the observation, the observation team should instruct teachers on how to wear the Swivl marker and determine who should wear it. If more than one teacher is leading the class during the observation time, the teachers must swap the marker during instruction to capture the interactions of both teachers. If the teacher who is providing instruction is not wearing the marker, the observers will not be able to accurately observe interactions between children or between the teacher and children.

Before the observation, the observation team should also provide directions to the technology liaison on how to handle extended periods of unobservable activity during the observation period, such as time spent outside or nap time. The technology liaison can shut down the Swivl and cell phones to conserve battery power.

Have a high-quality microphone backup. During the observation, place the cell phones around the classroom and mute during the live stream so that only audio from the marker the teacher is wearing is captured. Also, have a backup plan if any of the devices stop functioning. For example, in one observation we had to use the other cell phones to record sound instead of the Swivl, but these capture significant ambient noise and voices. As a result, it could become difficult to distinguish individual voices and thus observe specific interactions.

Plan for what to do when audio or internet issues arise. For example, although both the urban and rural areas that we observed had good technological capabilities and internet accessibility, we still encountered technological issues. During one observation, connectivity issues caused the audio and video to lag in the live stream, and in another observation, the connection dropped. To resolve connectivity issues as quickly as possible, be sure the technology liaison has the password to disconnect and reconnect to Wi-Fi and is always within the immediate area of the classroom being observed.

Set up the Swivl at least the day before the planned observation. In our observations, four teachers who served as the technology liaison reported the virtual observations were less distracting than in-person observations, as the observers were not physically in the classroom. Nonetheless, children may become curious about the Swivl robot and cell phones on tripods and might try to interact with the cameras during the observation. Those conducting observations should plan for a time between the training with the technology liaison and the observation to acclimate the children to having the equipment in their classroom. In addition, those conducting observations should consider turning off phone screens or using the back-facing cameras to prevent children from seeing themselves during observations.

Data collection

Determine whether to live stream or record observations based on the purpose of the observations and the need to obtain parental consent. Some providers may have concerns about privacy and the use of cameras in the classroom to live stream or record children. Based on local, state, and institutional review board policies, recording observations may require active parental consent. Active parental consent can be difficult to obtain for an entire classroom. With active consent, those conducting observations must allow enough time for the consents to be returned to the classroom and establish a threshold for the number of consents to be returned before moving forward with the observation. Further, teams must then determine an alternative option for the children whose parent did not consent for them to be in the study. Live streaming may have fewer privacy concerns and is more similar to an in-person observation than video recording, but video recordings could be beneficial for providing professional development and training. Those planning observations should consider the purpose of the observations to determine whether live streaming or video recording would be best.

Planning and logistics

Consider the logistics of planning and executing virtual observations and the burden for providers. Virtual observations might be a way to reduce burden and travel time for observers; however, virtual observations still require significant time among project team staff and require more time from participating providers. Those conducting observations should plan for time to work with the technology liaison before, during, and after the observation to ensure everything runs smoothly. The technology liaison will need to be trained on how to set up the equipment and what to expect during the observation. This is also a good opportunity to gather information about the classroom and instruction to help with planning for the observation.

On the day of the observation, allow adequate time to set up the equipment. The equipment setup time can range from 20 to 45 minutes depending on the room configuration, internet reliability, and the technology liaison's ability to set up the equipment independently (without assistance from observation staff). Once the equipment is in place, it can take an additional 5 to 10 minutes to adjust the cameras around the room if the observers request so.

To avoid disrupting teaching, the technology liaison should be available to assist with technology challenges during the observation. As such, we recommend the role of the technology liaison be separate from the teacher leading the classroom activities being observed. When selecting the staff member to serve as the technology liaison, make sure they are available to assist with planning, executing, and wrapping up the observation.

On two occasions the connection between the marker and the Swivl was lost when the teacher moved farther away from the Swivl. In addition, during one observation, the cell phone attached to the Swivl stopped functioning and we were unable to capture the audio from the marker. Those conducting observations must have a plan for contacting a staff member or the technology liaison who can address such issues.

Consider whether providers have enough available staff to support virtual observations. Providers might struggle with staff shortages, and FCCs might not always have backup staff available if the lead teacher is not available to be observed, which may result in cancellations. Those conducting the observations should confirm in the days leading up to the observation and on the day of the observation if the lead teacher will be present.

Ensure enough technology kits to address shipping and other delays. If you are conducting observations across the country, allow sufficient time to ship the equipment and for the technology liaison to receive it and complete training. For example, we sent Swivl kits across the country via FedEx overnight mail, allowing five days for shipping ahead of the technology training date that was scheduled for one to two days before the observation, but some of the equipment was not delivered on time. On the other end of the observations, providers must return the kits to the research team for inspection and cleaning before the team can send them out to another provider.

For small projects similar to this pilot, we recommend those conducting observations to always have at least two kits for every three planned observations, as well as one or two backup kits on hand, in case of shipping or other delays. For larger-scale projects, both in scope and duration, we recommend projects have one kit for each observation occurring in a two-week period. We also suggest one or two backup kits for every three planned observations in a two-week period. Those interested in implementing virtual observations should consider the cost of this technology, as several kits are necessary for conducting a successful study. See Appendix A. Considerations for conducting virtual observations for more details about technology and staffing requirements for conducting virtual observations.

Opportunities for future research or virtual observations

This pilot study showed that, despite challenges, successful virtual observations using the Pre-K CLASS are possible. To ensure this success, those conducting observations must plan for regular communication with provider staff and anticipate unique differences by collecting specific classroom information during recruitment. Future research could include conducting a validation study to compare in-person and various types of virtual observations.

Appendix A.
Considerations for Conducting Virtual Observations

In the following tables, we describe (1) roles and responsibilities for teams conducting observations, (2) the tasks a team must complete to conduct observations, (3) the time required for providers participating in observations, and (4) nonlabor costs for conducting virtual observations.

Table A.1 lists potential roles and responsibilities for a team conducting an observation. The number of staff needed for each role will depend on the number of observations being conducted.

Table A.1. Observation team roles and responsibilities for conducting observations

Team roles	Responsibilities per observation
Observation task lead	Manage overall process, including training, recruiting, and conducting observation.
Equipment logistics manager	Prepare observation equipment (Swivl kits), ship equipment to providers, receive returned equipment, and prepare equipment for additional observations.
Recruiters	Contact providers to recruit them and schedule observation.
Technology task lead	Work with providers to set up equipment and troubleshoot technology challenges.
Observers[a]	Use observation tool to rate environment.

[a] We recommend two observers score each observation, to ensure coverage for classroom activities taking place during the observation.

Table A.2 lists the tasks the observation team must complete to conduct virtual observations, the time to conduct each task, and the lead staff responsible for each task. Planning and preparation for the observations Mathematica conducted began three months before we started recruiting providers to participate in the virtual observations.

Table A.2. Tasks for observation team to complete virtual observations

Tasks for conducting virtual observations	Time to conduct task	Lead
Develop recruitment plan and recruit providers	Allow four to six weeks to recruit providers.	Observation task lead; recruiters
Coordinate parent consent	Once providers have been recruited, allow time to coordinate parent consent, if needed, and answer questions from parents about the observation.	Recruiters
Train observation team		
Plan and develop technology training materials (for example, technology training presentation and equipment manual)	Begin three months ahead of planned recruitment start for observations.	Observation task lead; technology task lead
Train and certify staff to conduct observations	Depending on the observation tool selected, allow four to six weeks for training and certification of staff.	Observation task lead; observers

Tasks for conducting virtual observations	Time to conduct task	Lead
Train each technology task lead	Allow two hours per observation; conduct training for the liaison one or two days before the observation.	Technology task lead
Conduct observations		
Schedule and coordinate observations	Allow two to four weeks to schedule and coordinate the observation with the sites or programs.	Recruiters
Ship observation equipment	Ship the observation equipment five days before the provider technology liaison training.	Equipment logistics manager
Set up observations	Allow 30 to 45 minutes before the observation to test microphones, cameras, and other technology.	Technology task lead; observation task lead
Conduct observations (livestream or record)	Allow four hours for each observation (depending on the observation tool selected).	Observers
Debrief providers (if desired)[a]	Allow 30 to 60 minutes per site, plus time for scheduling.	Observation task lead
Return observation equipment	Allow one to two weeks for equipment to be returned, inspected, and sanitized before the next planned observation.	Technology task lead (on-site); equipment logistics manager

[a] The team debriefed technology task leads about their experiences with the virtual observations.In Table A.3, we estimate the number of staff hours required for each virtual observation. Note that virtual observations might require participating providers to dedicate more staff time than in-person observations.

Table A.3. Provider staff time required to conduct each virtual observation

Tasks for conducting virtual observations	Hours per observation
Coordinate parental consent, if required	4
Train technology liaison	4
Set up equipment	2
Prepare, clean, and ship equipment	1
Set up technology and be available to troubleshoot during the observation	4.5
Participate in debriefings[a]	1
Total hours per observation	**16.5+**

[a] In the Mathematica observations, we conducted debriefed technology liaisons about their experiences participating in the observations. Debriefings could be considered optional for observation teams looking to complete more observations, or the observation team could consider conducting debriefings for only a subset of observations.

In Table A.4, we describe the nonlabor costs that observation teams might encounter when conducting the virtual observations.

Table A.4. Nonlabor costs for conducting virtual observations

Example nonlabor costs	Additional information
Shipping	Shipping costs will depend on whether the observation team is shipping materials interstate or driving materials to and from providers to conduct observations.
Swivl kits	Swivl robot costs can be found online. However, we recommend contacting Swivl directly to discuss pricing for the full kits.
Electronic wipes to clean equipment	We recommend wiping the equipment clean between each use.
For each observation: Three additional electronic devices (each with a data plan) and three tripods	We recommend using cell phones on tripods in addition to the Swivl robot to capture movement in the classroom.
Observational tool licensing and training	Costs will vary depending on the observation tool selected and the number of observers trained.

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