

## **Redesigned Zoom Interface to Increase Participation in Online Classes**

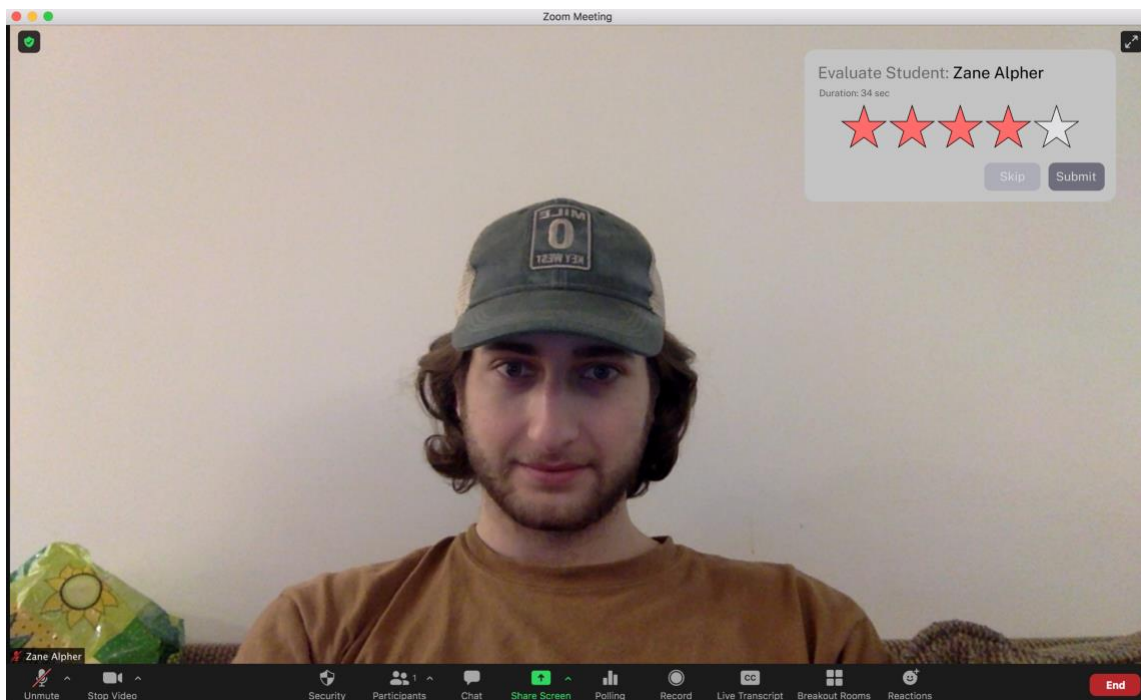
### **Introduction**

For discussion-based courses, the shift to online learning caused a dramatic shift in how the classes could be run. Having class over video chat raised a number of new barriers to class discussions and participation. With the rapid rollout of Zoom (and other video conferencing software), there were both technical and social challenges to overcome for students and teachers. Zoom originally pursued a B2B business model and designed their video conferencing software for professional end-users. During the pandemic, Zoom expanded quickly into the education space by offering free use for K-12 schools and pursuing contracts with colleges and universities. Although it provided a quick fix to schools and was better than no alternative, Zoom was originally designed to model a conference room, not a classroom. Over time, the need for additional features to assist teachers and facilitate classroom discussion has become more apparent. Through conversations and experience in classes, a new set of features for Zoom have been designed to improve the quality of online classroom discussions.

The first set of features are designed to help teachers keep an eye on participation in their course. These features can help in several ways. In a physical classroom, it is easier for teachers to track participation because they are able to see everyone at all times and can easily contextualize contributions. They can also respond and interact directly with students. In an online classroom, however, students appear at the top of the screen for a brief period and then disappear back into the crowd of faces. This makes it much harder to keep track of who is participating and who is trying to stay under the radar. In general, the goal of these features is to give teachers a better understanding of participation in their classes and how they can try and improve it.

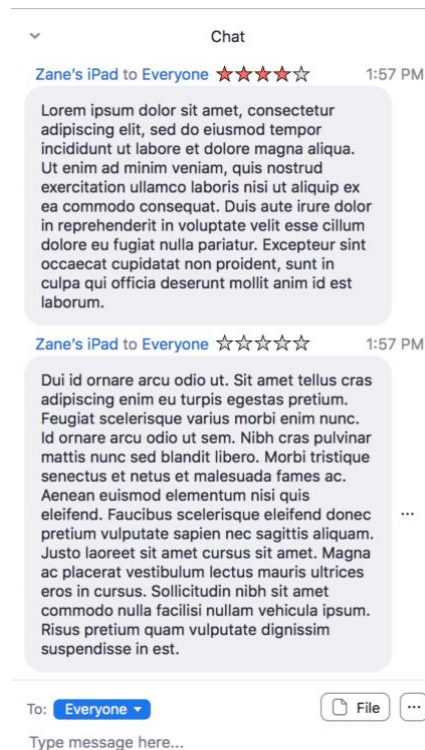
## Real-Time Evaluation

Because of the difficulty following students during a discussion, it can be difficult for teachers to keep track of student participation over the course of a semester, especially for larger discussions. With this feature, teachers will be able to evaluate student contributions as they happen for their records. After a student contributes to a discussion (unmutes themselves and speaks) a unobtrusive dialog box will pop and allow the teacher to evaluate the contribution. Teachers will be able to see a history of who is participating in class discussions and also who is making quality contributions. This can be used to help teachers who use class participation to grade, but there are other benefits as well. If students know that they are no longer able to slip by without being noticed, they will be more likely to follow along with the discussion and try and participate when they can. Teachers can also use this data to find students who aren't participating as much and encourage them to contribute more throughout the semester.



## Chat Evaluation

While not all classes make heavy use of the chat feature of Zoom, it has become an integral part of class discussions in others. However, it is difficult for teachers to keep track of chat and a live discussion. Similar to the real-time evaluation of live contributions, this feature will allow teachers to evaluate student's chat messages. Next to each student chat will be an area for teachers to assess the message and its value to the discussion. Once teachers have time to read the chat they can go back and mark high-quality contributions. This will ensure that students who participate through the chat still get the credit they deserve for contributing. Some students may feel more comfortable typing a contribution and students who do not have stable internet may not be able to easily participate in live video/audio discussion at all times. This feature offers similar benefits to the real-time evaluation and will hopefully encourage more students to message relevant information if they know the teacher will look at and remember who is contributing to the chat.



## Other Participation Features

There are several smaller features designed to help teachers get a better understanding of their class and individual students' engagement. Zoom offers the ability to export a meeting file with data on all participants such as the time they joined and left. For an office setting, this makes sense because you want to know who was at that specific meeting. However, in a classroom setting, it makes much more sense to look at aggregate attendance over the whole semester. While it is possible to do now, it would take a good amount of time and knowledge of excel data transformation to get that data. For some teachers, attendance isn't a factor, but for some discussion classes it is very important and there is no class without attendance. An improved version gives a dashboard—allowing teachers to see attendance statistics for each student. It could also alert them of students who are often late or try to slip out of class early which hurts the possibility for discussion in class.

In one study, over half of the students surveyed said they turned their camera off in class to do another activity in parallel (Gherheș, 2021). While some activities may allow a student to stay active in a discussion (eating or drinking), others completely remove students from the discussion (other work, phone use, or helping family/friends). While there are many circumstances where a student may need to turn off their camera, such as poor internet or not having a dedicated space to themselves, there are many students who turn their camera off as an excuse to tune out of online class and do something else. Along with automatically recording attendance, it will also collect data on what percent of the time a student spends on camera. For teachers who require or request cameras, this can help them determine who is actively participating in the discussion (even as a listener) and who might be trying to fly under the radar.

| Student | Attendance  | Camera | Discussion Participation | Chat Participation |
|---------|-------------|--------|--------------------------|--------------------|
| Alice   | 15/15 (97%) | 90%    | ★ ★ ★ ★ ★ (22)           | ★ ★ ★ ★ ★ (4)      |
| Bob     | 14/15 (94%) | 63%    | ★ ★ ★ ★ ☆ (12)           | ★ ★ ★ ★ ★ (15)     |
| Charlie | 14/15 (99%) | 0%     | ★ ★ ★ ★ ☆ (9)            | ★ ★ ★ ★ ☆ (19)     |
| Doug    | 15/15 (85%) | 47%    | ★ ★ ★ ☆ ☆ (6)            | ★ ★ ★ ★ ☆ (3)      |

### Note on Participation Data and Grading

The goal of these features is not to generate data to insert into a formula and produce a participation grade for each student. Teachers should use this data holistically, taking into consideration many factors, including extenuating circumstances students may have. For example, not everyone has good enough internet access to consistently stream video, so if that is the case then teachers should not take into account their lack of camera use. Some students may have to work in an area with other people and are unable to use a microphone often. Such a student shouldn't be penalized for using the chat instead of speaking. There is also no single formula able to capture participation in a single grade. Different teachers may value different types of contributions. For example, should a student score higher for several very high-quality comments or for more regular, medium-quality contributions. Teachers can use each aspect of the data in different ways to create a personalized solution. The data is all private to the teacher and cannot be seen by the student contributing or other students. Students may be discouraged seeing low evaluations or try and game the system—without realizing the full context through which the data will be used.

While the first set of features help to encourage participation over the course of the semester, the next set of features are designed to improve participation by making the online class experience better. While Zoom tries to mimic a real classroom, because of limitations in the technology and a new set of online social interaction standards, it comes up short in a few key

areas. By offering slight enhancements to the Zoom interface, some of these new barriers can be broken down for online discussions.

### **Breakout Rooms**

Zoom offers the feature of breakout rooms, which allow for small group discussions and can give students extra opportunities to offer their opinion in class. However, this comes at a small cost because the instructor is no longer able to see what is happening. Teachers can jump between breakout rooms to see and hear what is happening in each one and help continue the discussion but if the discussion in a room has stalled or gone off course the teacher won't know until they join the room. In some cases, students simply turned off their cameras and microphones and did other work for the duration of the breakout room. In a traditional classroom, when a class is divided into small group discussions, the teacher can easily scan the room or walk around to get an overview of all the concurrent discussions. This feature would allow the same thing in a Zoom classroom. It would provide a dashboard for teachers to see activity in each breakout room such as the audio level and camera usage. If they notice a discussion starts to trail off (or students ignoring the discussion), the teacher can join that room and help restart the conversation. Teachers can also use the data to know when groups have wrapped up their discussions and should be called back to a main room.

Currently, there are three ways for teachers to create breakout rooms in a Zoom session. One option is to create randomly sorted rooms, but to set specific rooms teachers must either upload a CSV with specific formatting or use Zoom's current interface, both of which have their own issues. Many teachers struggle with the technological aspect of setting up the CSV document and there are sometimes issues if students are not properly logged in or registered to Zoom. The interface built into Zoom allows teachers to create rooms on the fly, but it is clunky

and the checkbox system it offers is not intuitive to use. A new design would simplify the interface for teachers and speed up the breakout room creation process.

One final feature to improve breakout rooms is to improve the communication between the teacher and students in rooms. Right now, teachers can send a single message to all breakout rooms, but students cannot respond to this message or ask follow-up questions. The message also disappears after a brief period or another message is sent. An improved system would allow for multiple persistent messages to be sent to all rooms or just a single room. Students would be able to respond directly to the professor to follow up or ask for help.

Gherheș, Vasile, et al. "Analysing Students' Reasons for Keeping Their Webcams on or off during Online Classes." *Sustainability*, vol. 13, no. 6, 2021, p. 3203.,  
doi:10.3390/su13063203.