Behind the Learning Glass

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Introduction
For our poster project with the STEM Instructional Program, we made Learning Glass videos to supplement material in Algebra II and Precalculus sections and then assigned a worksheet and survey to gain some understanding of how the students interacted with the videos. In this poster, the process of making the videos is discussed and some key takeaways are provided with the hopes of helping others in using these types of videos as a tool for providing instruction.

Learning Outcomes
The first questions we were posed when planning to create instructional videos using the Learning Glass Studio were the following. What topics did we want to cover in the videos? What examples would be instructive for these topics? Of course, instructors want to provide assistance on the most important material and, typically, on material that students commonly have difficulty with. If an instructor knows that students struggle with certain concepts, likely it is because they have tested these concepts on some assessments and so student comprehension of these ideas is measurable. These observations together readily suggested that learning outcomes are a good place to start for the videos. Our focus was on algebra and precalculus topics and so, after careful consideration, we decided to tailor the content of the videos to the following learning outcomes.

After watching the videos, students will be able to . . .
- Identify whether a relation given as a table is a function
- Evaluate a function at a number or an expression
- Describe in writing what mathematical notation represents in a real-world problem
- Compute the average rate of change of a function on a given interval

We picked these learning outcomes for their general importance, not only in their respective courses, but to future courses as well. In addition, from our team’s experience, these outcomes often cause trouble for at least some students, if not many.

Picking Problems
Next, it was important to choose specific examples to discuss in the videos and write up script notes to follow in making the video. We had two primary principles in choosing these examples. First, we chose examples that students might expect to encounter on some assessment. The rationale for this was to build student awareness of the precise meaning of the learning outcomes. Second, when possible, we added components to the problems that students often have misconceptions about.

Our Process
With our content tailored to the learning outcomes we selected, we were ready to make the videos. The Learning Glass Studio at Western Michigan University has staff to assist with recording technology, so our main focus was on the quality delivery of the content for the video. The main advantage of this studio is that you can write while facing the camera, so that students can see you as if you were addressing the class directly. Collaboration was particularly useful here, as some team members were able to make revisions to the scripts to reflect what we were experiencing while making the videos.

Key Takeaways
1. Practice the script in advance. It is difficult to reference a script mid video without running into some issues.
2. Choice of clothing matters. The background is dark so you do not want too dark of clothing or you might blend in. However, if your clothing is too bright, it will make the writing overlapping with your clothes difficult to see (as the markers are bright colors).
3. Slow down. As experts in the material, we tend to explain it quickly, which can make it difficult for students to follow. If this is an issue, you can also remind students to pause the video often to check their understanding.
4. Keep the videos short. Longer examples can be broken into smaller videos. This will help from overwhelming the students and also reduce the pressure on the instructor as the chance of making a mistake increases as time goes on.
5. Mistakes can be okay. If you address it during the video, then you do not necessarily need to stop recording, as it could be beneficial to see that even the instructor can make a mistake. If it is caught in proofing, text prompts can be used to correct it, given the mistake is not major.
6. Address verbal fillers. Particularly, making such videos consistently can be beneficial to the instructor in improving public speaking, an important skill for educators, while increasing video quality.
7. Write up prompts in advance. This allows you to make sure any problem or scenario in consideration is precise. In addition, writing these on the glass on a space difficult to reach, such as the top, allows you to use that space more effectively.
8. Include metacognition. Since students cannot ask you questions during the video, detail your thoughts thoroughly to avoid confusion.
9. Editing is a powerful tool. Additional information or demonstrations can be edited into a video to expound on points possibly lacking clarity.

Research Poster Design Services
Once the videos were created and edited, they were posted in the classes’ learning management system, elearning through D2L, so that the students could access them. We checked in with the students on the content of the videos by assigning a worksheet including similar problems. Along with the worksheet, a survey was given to solicit student feedback. This data is included in another poster.

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