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Through the Learning Glass

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Through the Learning Glass
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STEM Instructional Program 2019-20

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 results of the worksheet and related survey are provided. In addition, we reflect on what the data and student feedback mean for these types of videos moving forward.

Worksheet Results
We created five Learning Glass videos for algebra II on the topics: definition of a function, interpretation of a function, evaluate function at a number, evaluate function at an expression, and average rate of change. Each video is about five minutes long. To access the students’ understanding on these topics, we assigned a worksheet which contains three problems, worth 13 points in total. Problem 1 has parts a and b, each worth two points; problem 2 has parts a and b, each worth four points; problem 3 is a multiple-choice question worth 1 point.

Survey Results

1) Out of 175 students, 171(97.71%) of them have watched educational videos on other platforms to understand math and 4(2.29%) of them have never watched any educational videos.
2) In the six videos, 152 students watched definition of a function, 120 students watched interpretation of a function, 118 students watched evaluate a function at a number, 94 students watched evaluate a function at an expression, 99 students watched average rate of change, and 25 students did not watch any. Note: The worksheet does not access the topic of average rate of change but there were still 99 students who watched that video.
3) Out of 171 students, 121(70.76%) students prefer videos made by WMU, 45(26.32%) students prefer other videos, and 5(2.92%) students did not watch the videos.
4) Out of 167 students, 140(83.83%) students were satisfied with the pace of the videos, 14(8.38%) thought the videos were too fast, 6(3.59%) students thought they were too slow, and 7(4.20%) students did not watch the videos.

Suggestions for Improvement
We asked students to provide feedback and suggest ways to improve the Learning Glass videos. Although responses varied widely, there were many valuable suggestions for improvement. Some popular student suggestions fell into the following categories:
- Providing more examples or more complex examples
- Demonstrating multiple ways to approach examples
- Improving the audio and lighting qualities of the video
- Giving students access to the videos outside of learning to increase playing speed
When planning the videos, we chose to short videos that addressed one specific learning outcome. Thus, we hoped our students would be able to apply the knowledge from the Learning Glass videos directly to their coursework. Some educational videos that already exist address learning outcomes more broadly or with knowledge that is not pertinent or known to our students. Many educational videos are also longer than the Learning Glass videos.

Since some students suggested more depth, we conclude that many students may be willing to watch additional Learning Glass videos that could expand upon the basic ideas covered in our videos. We’ve learned that students are interested in watching Learning Glass videos designed for their courses. Hence, additional videos could be created to provide students with more detailed examples and approaches to problems. By providing multiple videos about the same learning outcome, but with varying difficulty, we’d hope that each student would be able to find a video that is helpful at their current level of understanding of the material.

Positive Reception
We asked students to share what they liked about the videos. Here are some of the things they enjoyed:
- Physically seeing WMU instructors explain and solve problems behind the glass
- Quick, direct, and simple delivery of the material
- The worksheet that accompanied the videos which provided extra practice of the material
- The ability to watch videos any number of times
- The videos resolved confusion that students had after the material was first presented in class
- The videos deepened students’ understanding of the material

Students recognize us from their classes and from the Developmental Math Tutor Lab. Some students mentioned that they liked having a personal connection with the instructors from the videos. Overall, students think the content of the videos was appropriate and helpful. Before making and sharing the videos, we conjectured that the videos would make learning outcomes easier for students to achieve. We are pleased to hear that most students agreed that the videos clarified or strengthened their understanding of the material.

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