

Using Online Resources to Study Mathematics: Students' Perspectives on Effectiveness and Ethics

Ander Erickson
University of Washington Tacoma

Tramon Jones
University of Washington Seattle

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Students in undergraduate mathematics classes are using online resources to support their learning with increasing frequency (Erickson, 2019, 2020). The use of such online resources has not proven to be straightforward for students. Undergraduate students have well-documented difficulties locating, evaluating, and making use of information sources regardless of the topic area in question (Scott & O'Sullivan, 2005; Walraven, Brand-Gruwel, & Boshuizen, 2008). These difficulties may vary depending on a student's familiarity or comfort with the field (Brand-Gruwel, Wopereis, & Vermetten, 2005). Thus, it is important to develop subject-specific models of student information-seeking. This is particularly important for the field of mathematics due to the role that lower-division math classes have often played as a gatekeeper for entry into STEM majors (Martin, Gholson, & Leonard, 2010).

This poster will present findings from a nationwide mixed method research project that has collected surveys from over 300 students across the country and follow-up semi-structured interviews with over 60 students intended to assess how students currently make use of online resources to support their learning in lower-division mathematics classes. These findings specifically address the following questions:

1. From the students' perspective, what does it mean to efficiently use online resources to study mathematics?
2. From the students' perspective, what does it mean to ethically use online resources to study mathematics?

These findings also include a mid-range theory of students' use of online resources based on a grounded theory (Strauss & Corbin, 1994) analysis of the interview transcripts. The poster will present this theoretical model in which we identify triggers for the use of online resources, along with the most common types of resources used and the accompanying goals. For example, students commonly make use of online video lectures if they are having trouble understanding what their instructor is saying in class or look up solutions in an answer engine when they feel that they need to double-check their homework.

We present evidence that students are generally conscientious in their use of such resources, struggling both with how to maximize their efficiency while also expressing concern that their practices are ethical. These two concerns are sometimes balanced against one another as is evidenced by a recurring student suggestion for their peers: start by learning on your own and only make use of online resources when you struggle.

Finally, our poster will present several representative cases in order to better capture the way in which students balance these concerns in different types of mathematics classes. These narratives have the potential to be used in classroom settings in order to help students become more effective and ethical users of online resources.