How do Students Engage with Their Math Textbooks? Development of a Qualitative Instrument to Analyze Students’ Responses About Textbook Use

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Abstract

Online textbooks are beneficial because of their accessibility. In this research, we would like to know how this new format of textbooks affects teachers' teaching and students' learning of mathematics. We collect data from students' reported usage of three online textbooks and their responses to weekly survey questions. In order to analyze the responses, we develop an instrument that assisted the researchers in performing thematic analysis. We are currently developing a new version of the coding scheme that can help the research team to identify the trend in the data and make summaries of students' responses. Future endeavors will need to refine the instrument aiming to further adaptation and use in other contexts.

Methods

After getting the data from the survey, we first match the IDs with to see if some of the data was missing or misplaced. Then we cleaned the records by looking for repeated responses. To demonstrate the coding procedure, in this poster, we use 344 students' responses to question “What do you do while reading your textbook?”

Expected Outcome

I used the frequency of each code to see trends in the student's responses and to write a summary. For example, I can see that most students mention examples in their responses, follow by theorems, definitions, exercises and reading questions (see Figure 5).

When I coded some of the responses, I found that some responses had information that can be inferred to but not explicitly stated in words, while some responses were ambiguous in the description on what the student was doing.

Implication and Discussion

This process contributes to developing the natural language algorithm to extract the information from a much larger set of the responses to other questions. The process runs in cycle; after we get this new version of the code, we individually code the response according to this new version and compare them with each other. We would like to create the algorithm that can systematically extract the information from the responses.

The code that we create will be applied to other questions in bi-weekly logs. Moreover, this new algorithm might be able to apply to responses from other contexts.

From this project, I learn about the process of qualitative research and coding instrument. I acknowledge that there is the need for the human to read the responses in order to develop the tools to analyze them.

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References