Proposal

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1 Description of Problem

With the expansion of technology, there have been many different tools that have been created such as mobile and web discussion forums. Many students ranging from high school to college students use these discussion boards in order to improve their education. There are several problems with the current discussion boards that exist today. One major issue on discussion boards is that there are a high volume number of posts, which make many posts difficult to follow (Suler, 2004). This causes numerous issues like repeated topics, lengthy discussions that you have to scroll very far in order to potentially find what you're looking for, and several other issues. There should be more sub-content and divides so that the content on the discussion boards are much easier to follow. Another issue is that while discussion boards have seen to help with new and concepts, students still had trouble with mathematics or science problem solving questions (Andresen, 2009). A lot of discussion board posts primarily deal with words and explanations. Math and science problems are harder to solve and understand through just pure word explanations. It can also be somewhat troublesome to write mathematical or science symbols, which is a very important part of learning these concepts. In the past there were also some issues involving trying to apply data and text mining technology for discussion forums, because some difficulties came by like the complexities and inconsistencies within natural language text places that would not work out as well (Dringus, 2005). There is potentially a lot of rich information that can be gathered, from using more updated advancements within data mining technologies.

2 Existing Solutions and New Solution

There are a decent amount of existing mobile and web discussion boards for students in High School and College. A lot of them are great to use but just have several flaws, which is why I am proposing my own solution. Some examples of the existing solutions today are Edmodo, Flipgrid, Piazza, and Chalkup. Most of them are similar with the discussion boards though with slight differences. Like Edmodo and Chalkup are centered on a Learning Management System, Piazza has a job recruiting function, and Flipgrid makes your responses in video format.

Earlier I mentioned that most of the existing discussion boards have a high volume of posts. This makes it harder to learn and navigate through topics. We can resolve this issue by splitting students within larger classroom settings into smaller groups, and thus group members are more likely to participate among themselves (Michaelsen, 1992). Having an app at the start the class split the students into smaller groups automatically with their own discussion board, and then another overall discussion board with the whole class, will allow for much more participation and less volume in the larger board.

The other issue involved discussion boards not being as useful for topics involving problem solving skills, can be resolved by integrating tools. There was a study done with students who used technologies like PowerPoint, Smart Boards, Google Docs, etc., overall performed 70% higher grade-wise for Mathematic topics than students who did not (Hudson, 2010). Integrating a tool similar to Google Docs where multiple people can participate in with more ease of inserting symbols would help out. Having a similar PowerPoint sliding screen as a tab can also help to explain the methodologies within a problem.

In all the applications, there is not really much statistical information or data mining on these applications besides Piazza. More of the simple statistics are on Piazza like total user, posts, response numbers and times, etc. Data mining and text mining techniques offer providing an analysis of the trends and relative forum participation (Dringus, 2005). Some of the additional analysis I would like to have incorporated would be learning patterns (re-occuring difficult topics) and participation trends (relative student responses to each other and most/least posts). This information would help instructors in the future course planning.

Right now from existing studies, students who participate more often in online boards are not more likely to get higher grades; they do show students who get lower and failing grades less likely to participate in online boards (). I feel as though the reason why the higher and middle ranges of students have similar online participation rates is because of some of the issues about online boards that I mentioned above. Having students and instructors with the additional features should improve learning rates and teaching improvement.

3 Design of Tool

I am proposing a web-based application similar to how other online forum based discussion boards look like. There will be a login screen when you first enter. After that there will be a bunch of categories that the instructor has created. Clicking on one of the categories will bring you to several different posts made about the current category.

Students will be auto-assigned groups when they first are assigned a classroom. To make note taking easier, posts and comments can swiped to be saved on another tab. On the top page will be the different tabs where you can switch views. The first tab would be the home tab involving the main discussion board. The second tab leads you to the discussion board within your small group. Third tab will be the swiped notes, which you can go in and read or delete. Fourth tab will be the incorporated Google doc within your small team. Fifth tab will be posts containing slide decks of explanations of certain methodologies, which any student can create. The last tab will contain all the statistics and information that was data mined from the content on the discussion board.

4 Resources

- I will be using Microsoft Visual Studio 2017 for development
- The technology that will be used is ReactJS, Firebase, HTML, CSS
- Realtime API from Google for integrating Google Doc
- Development will be done on a Mac computer

5 External Resources Needed

No external resources are needed for this project.

6 Milestone Descriptions

The first milestone will involve getting the design and the setup of the discussion board working properly. A functional prototype should be provided with minimal functionality. This is mostly to get the page running and used as a basis for the future additional features. Perhaps if extra time, some of the newer features can be worked on as well.

The second milestone this time allows for the online discussion forum to split the users based on smaller groups randomly. The other additional feature is that students can also save whatever important comments by simply swiping to a notes tab. This is an easier way for the students to save more of the important notes. This will be a functional prototype as well.

7 Calendar

Week	Week End Date	Time (Hours)	Tasks
6	6/25/2018	1	Weekly Status Check 1
6	6/25/2018	5	Read about ReactJS

6	6/25/2018	10	Design HTML Webpages
6	6/25/2018	5	Code basic Frontend JS Functionality (buttons, routes, data transfer)
7	7/2/2018	10	Intermediate Milestone 1 Prototype/Writeup
7	7/2/2018	1	Weekly Status Check 2
7	7/2/2018	5	Have Backend and Firebase Setup
8	7/9/2018	1	Weekly Status Check 3
8	7/9/2018	20	Adding Small Groups Feature
9	7/16/2018	10	Intermediate Milestone 2 Prototype/Writeup
9	7/16/2018	1	Weekly Status Check 4
9	7/16/2018	10	Swiped Notes Feature
9	7/16/2018	5	Feature Testing
10	7/23/2018	1	Weekly Status Check 5
10	7/23/2018	5	Data Mining Features
10	7/23/2018	5	Final Project Presentation
10	7/23/2018	5	Project Paper
11	7/30/2018	5	Data Mining Features
11	7/30/2018	5	Final Project Presentation
11	7/30/2018	5	Project Paper
11	7/30/2018	10	Slide Decks Feature (extra) Google Doc Integration Feature (extra)
Total Hours:		115-125	

8 Tasks List

- Designing the HTML web pages for the forum like how the posts are created
- Implementing the ReactJS features into the forum
- Setup backend and Firebase to handle data
- Implementing randomly selected small groups within the discussion board
- Having a swipe feature that allows for easier note taking
- Using data mining to get information about learning patterns and participation trends
- A tab that allows students to post a series of slide decks explaining a concept or methodology (extra if have time)
- Integrating Google Docs into the board as a tab (extra if have time)

References

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assessments, and limitations. Journal of Educational Technology & Society, 12(1), 249- n/a.

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