

Executive Summary:

Reflective writing aids medical students in reflecting on their experiences while in medical school. These writings provide a wealth of information that could be used by medical educators to identify key challenges, improve the coverage of their curriculum, and promote interprofessional skills.

Problem Statement:

However, extracting this information presents a challenge as manually reviewing these texts is labor intensive and difficult for humans to categorize given the variety of topics that can be discussed in a single survey question. To aid in this, the VCU's Wright Center for Clinical and Translational Research developed a Natural Language Processing (NLP) tool that automatically extracts common challenges experienced by medical students from these reflective texts. However, utilization of this tool requires a level of programming knowledge not commonly held by medical educators.

Objective:

The purpose is to create a website that can be accessed by professors and allow them to upload data that will then be sorted using natural language processing and placed into a graph. This will allow professors to view student comments using a graph that displays similar general ideas into clusters making reviewing feedback more efficient.

The goal of this project is to develop MedTop (Medical Topic analysis), a web application that will allow non-technical users to run and fully explore the results of this NLP tool without the need for any prior programming knowledge.

Value Proposition:

Professors struggle to review and analyze student feedback. Currently professors would have to read every comment and find common suggestions between them. There is currently no software that can analyze this data for them. If there was a tool professors could upload student feedback into that would analyze the data for them then, it would be much easier for them to collect valuable feedback.

MedTop will make a novel NLP tool *accessible* to medical educators, allowing them to identify significant challenges encountered by their students. This will *empower* them to improve their medical curriculum, which in turn will aid in students' transition into professional practice, ultimately resulting in better patient care.

Technical Volume:

In this project, we propose to implement this web application using a selection of existing frameworks. The front-end will be built using React and D3.js. React will be used in implementing the user interface, while D3.js will be used to provide varied forms of interactive data visualizations. The back-end will consist of a Flask API, and will facilitate interaction with the NLP tool. The main panel will display *dynamic visualizations of results* generated by the tool, and will be scalable. The left-side panel will provide management tools for uploading the data, including an *interactive list of files*, and will allow the user to *easily search through and manage their files*. This panel will also include a tab with settings for executing the analysis. The right-side panel will be populated with detailed information on data points the user has selected from the visualization, allowing them to *easily interpret the information being displayed*. The user will have the option to *export their raw data*, as well as any graphs generated. They will be able to re-import data, which will regenerate the visualization without having to reprocess data. There is currently no other tool like this.

Management Volume:

This particular product's intended use is specifically for medical educators. There is currently no need for IT contacts due to the lack of need for maintenance. There is also no need for stakeholders because the web app is to be used as a nonprofit.

Cost Volume:

Dr. McInnes is the faculty advisor for two senior design teams. Both of these teams, including this team, provided funds from their budget to purchase a shared computer for both teams. When the project is complete a server will either have to be purchased or leased to host the web app/api.

Resource Volume:

The skills needed in order to complete this project include but are not limited to react, Flask, Python, Javascript, and D3. Many of these skills were self taught specifically for this project.

