

Purpose: Data dashboards are a promising technology that are becoming more accessible to use in medical education. However, studies describing the implementation, use, and impact of these dashboards are limited. The focus of this work was to create a dashboard of student performance in the medical knowledge competency, gather student engagement feedback, and determine how students use the dashboard to guide their learning.

Approach/Methods: We developed an individualized data dashboard for each pre-clinical student using Tableau. The data set consisted of every multiple-choice question answered on summative exams through the first two years of medical school (~2500). To provide more detailed data than overall performance, each question was tagged to four domains based on the USMLE content outline: competency, discipline (i.e. anatomy or physiology), system (i.e. renal or respiratory), and processes (normal or abnormal). The dashboard displayed aggregated data in these domains through color-coded bar charts, and students could interact with it to obtain longitudinal insights into their learning. The dashboard pilot was conducted in the spring of 2020 among second year students and feedback was collected via a survey. Interviews were also conducted with 10 students to gather detailed illustrations of how students interact with the dashboard, as well as features that they thought were valuable. Lessons learned from the pilot implementation, as well as survey and interview data, informed the next iteration of the dashboard which was launched in October of 2020.

Results/Outcomes: The development of the dashboard is an iterative approach, with results informing future improvements. After the initial pilot, survey results showed that only 102/182 (56%) of students accessed the dashboard at least once. Of those who used the dashboard only 54% thought that the dashboard was at least a little useful in studying for Step 1 and only 42% of students reviewed their data with an advisor. Despite these results, the interviews demonstrated a strong interest in the dashboard, clarified how students interacted with it, and provided several key areas for improvement.

Discussion: We successfully created a summary data dashboard for pre-clinical medical students. Understanding student use and value of the dashboard has demonstrated potential to improve learning, though the data has been limited by a lack of student usage. Future iterations aim to include features that students expressed were desirable and valuable. Additionally, we will expand the dashboard beyond medical knowledge to provide meaningful insights about student performance in additional competencies.

Significance: Data dashboards hold great potential in medical education, but students must first be able to easily access it. The easier it is to access and navigate, the more likely students are to use it. Students must also understand the data, which implies a certain level of data fluency, as well as clear visualizations. Once these conditions are met, higher value activities such as reflection and analysis can occur to derive insights that lead to behavior change. Next steps for this work include a more detailed exploration of how students reflect on and analyze their data in ways that lead to behavior change.