Derivative Application Project

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# Summary

To address the problem of students struggling with derivatives in their introductory calculus courses, we have created a website ([www.applyderivatives.weebly.com](http://www.applyderivatives.weebly.com)) with tabs explaining the concept, mechanics, and applications of the derivative. It also includes advanced examples as well as a feedback section.

# Problem Statement

At Boise State University, only 52% of students passed [introductory calculus] in 2005 (Callahan. Pyke, Shadle, & Landrum, 2014, p. 3). Furthermore, it is shown that “traditional classroom teaching may not be the best approach to teach college students…” (Alu-Holou, et al., 1999, p. 435). Because we are not yet in a time where there is a reasonable alternative to traditional classroom teaching for classes like this, different resources must be utilized. Some of these resources already exist and are used today. These include Khan Academy, which provides videos that teach the basic mechanics of calculus concepts, as well as many other topics. Some students utilize online discussion forums, such as PhysicsForums. Others make sure they spend time in his or her professor’s office hours. This allows the students to ask questions to clarify material. Unfortunately, while these resources provide separate benefits, a single resource that captures all of these in one place has yet to be developed. To address this, we have created a website that allows students to communicate, explains the concept of the derivative, and shows applications for mechanical and industrial engineers.

# Feasibility

After publishing our first draft, we needed to gain feedback to assess the usability of the website. To do this, each team member sent an email with a link to the website to students taking calculus. We also emailed this link to all of the students in section 7 of English 314 at Iowa State. In the emails, the team members asked students to fill out the feedback form under the ‘Feedback’ tab on the website. After emailing 40 students, 10 students filled out the feedback form. The form asked students to rank the website on a scale from 1 to 5 on different categories of user-friendliness and overall helpfulness. 90% of students answered with either a 4 or 5 when asked about the helpfulness of the videos showing derivative applications. There were 7 videos made by the team members; these videos are the primary difference between this website and other math help resources. It is for this reason that the 90% score mentioned above shows that the team appropriately addressed the problem. The team also received 6 comments through this feedback form. While the responses were mostly positive, one comment asked that the document in the ‘Mechanics’ tab be shown as a PDF instead of a Word document, as it is easier to click on the URL’s in a PDF. The team made this change, and this document is now shown as a PDF. These methods of receiving and incorporating feedback show efforts to establish feasibility of this resource.

References:

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