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*Implementing a Web-based System for Tagging Errors in Freshman Calculus Using Pen-Technology.*

Pen-technology enabled the construction of a large database of student work in Calculus which motivated the tagging and analysis of student errors and problem-solving strategies. To minimize failure rates, we want to know where students in at-risk groups, and students in general, are making errors and then, guided by an extensive statistical error analysis, develop and evaluate new teaching materials and online instructional interventions. For example, is it accurate to say that the precalculus preparation of transfer students is responsible for their high DFW rates in Calculus I? Through collaboration between the Department of Mathematical Sciences and the Department of Computer Science, funded both by Hewlett Packard and NSF, we have been able to enhance the web-based software, MessageGrid, to meet the needs of this tagging project. The process of developing an error-analysis study based on tagging involves the interplay of several components, including the development of a tagging lexicon. In Summer 2010, several faculty members and graduate students developed a lexicon of errors and tagged thousands of pages of Calculus I finals from Fall 2009. We report on the process and our initial findings. (Received September 20, 2010)