A Comparison of Team Performances Using Four Scenarios of Feedback

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Abstract
When providing feedback to students working in groups, professors may use a variety of methods. Using computer generated feedback to give direction and correction for group assignments provides a way to maximize the professor's time and provide consistent feedback across different groups and assignments. This article discusses the effect of two types of computer generated feedback. The first is a semi-automated process for inserting pre-defined comments in student papers (the software is titled Strategy Assistant). This software allows the professor to define the most commonly used feedback information, and then easily insert his comments on student papers. The second type is an automated process for giving grammar and style feedback. The automated grammar software (Edit Assist) checks the student paper for numerous grammar and style errors, then automatically inserts comments that identify problems. This article discusses the improvements in group performance with each of these types of feedback and measures the change in student performance during the course of a semester. Both types of feedback tended to improve student performance over the course of the semester, with the Strategy Assistant having the biggest impact on student grades and Edit Assist having the biggest impact on writing style error improvement.

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The increasing demand for Web-delivered courses is forcing professors to seek technology solutions to help manage the development and delivery of these courses. Several studies show that a Web-based course is about 2.5 times as time-consuming to offer versus the same class in a traditional format. These time demands bolstered a need for technology to increase the professor’s efficiency in time management and teaching effectiveness to foster increased student learning.
Christ and Christ (2006), in reflecting on the numerous studies in the literature concerning automated feedback and its effect on student behavior and performance, explained that, “…the exploration and applications of technology have not kept pace with the improvements in the availability, flexibility, and reduced costs of technology.”

This article explores the effect of semi-automated feedback on student performance in the application of crafting and executing business strategy principles (identification and analysis of the firm’s external and internal environment, past and present strategy identification, formulation of problem solutions and action plans, identification and valuation of alternative strategies, and formulation and support of recommended strategy). This article also focuses on the effectiveness of automated feedback in improving students’ writing, organizational, and presentation skills in reporting their analysis, findings, and recommendations.

Specifically, this study will focused on analyzing team performance based on case scores where four scenarios of feedback were provided. The effect of semi-automated computer generated feedback concerning content was explored by analyzing the number of professor’s comments related to content versus the case grade. The effect of automated editing feedback concerning writing performance was explored by analyzing the number of grammar and style errors identified in the analyses versus the case grade.

**Research Methodology**

Students in four sections of the MBA capstone course (Managerial Policy & Strategy) at Texas A&M University-Texarkana offered via a Web-based format were involved in the study. The course required students to apply and integrate principles from various business disciplines including accounting, finance, marketing, management, and economics in the identification and solution of managerial problems and the development and implementation of corporate strategies in a changing environment. The course was taken during the students’ last semester and required that students had completed all MBA background courses or if a student was pursuing MSBA degree, students had completed all required leveling courses.

Students self-selected their course section at registration. In an effort to simulate the normal work environment that most students will be a part of, teams were employed in reaching the teaching objectives. Students in each of the four sections self-selected their four or five member teams as well. A student not self-selecting a team was randomly placed on a team. This resulted in four teams in three course sections and five teams in one section totaling 81 students involved in the study. Each of the four class sections were randomly assigned feedback as follows:

- In section 1, students would only receive a score on their case analyses with no additional feedback.
- In section 2, students would receive a score and computer-generated comments concerning grammar and style errors. The Edit Assist program was used to accomplish this and is described in the Test Instruments section below.
- In section 3, students would receive a score and semi-automated professor’s comments only. The professor’s semi-automated comments program is
described in the Test Instruments section below and hereinafter is referred to as Strategy Assistant.

- In section 4, students would receive both computer-generated comments from Edit Assist and the professor’s comments using Strategy Assistant.

For this study, three relatively complex cases were used for the team assignments:

- Near the beginning of the course, the “Dell Inc. in 2006: Can Rivals Beat Its Strategy?” case was assigned.
- Near mid-semester, the “Adidas: Will Restructuring Its Business Lineup Allow It to Catch Nike” case was assigned.
- Near the end of the semester, the “eBay: Facing the Challenge of Global Growth” case was assigned. (Thompson, 2007).

Student analysis and report write-ups for cases at this level of complexity normally consist of 20 to 30 pages depending on writing style, succinctness, and depth of coverage. In order to assure fairness among all sections and to eliminate concerns of the test subjects relating to grade advantage or disadvantage by participating in the study, all students were assured that grades would not be affected by this study and that should there be any sectional grade advantage because of the study, proper equity or leveling adjustments to their case scores would be made.

**Test Instruments**
The test instruments, in addition to the cases mentioned above, consisted of two computer programs: an automatic grammar and style analysis program and a semi-automatic program with standardized comments developed by the professor for the course. Both programs were developed for use in these classes to increase time efficiency, consistency of feedback, and teaching effectiveness.

**Strategy Assistant**
Strategy Assistant is a computer program that runs in Microsoft Word and permits the professor, while scoring an analysis prepared in Word, to insert comments by blocking a deficient section or subsection and clicking 1 of 19 menu choices (table 1) to insert a pre-prepared comment at the beginning of the students’ analysis. The professor’s comments outline the content that should be in the student’s analysis (figure 1).

The professor’s comments vary in length and range from a short paragraph addressing the “Table of Contents” to several paragraphs including bullets to address the “Industry and Competitive Environment” section. All comments made by the professor appear at the beginning of the analysis (figure 2).

**Edit Assist**
The Edit Assist software was developed to assist professors in evaluating electronically submitted papers by reducing the drudgery of commenting rudimentary errors. With a mouse-click, this tool automatically scans documents, detects areas of concern, and
inserts comments to identify grammar or writing style problems. In this study, the Edit Assist tool applied over 200 grammar and style rules that addressed:

- clichés, colloquial expressions, and conversational writing
- one-sentence paragraphs
- words that are inappropriate, repeated, or not listed in a dictionary
- use of first or second person
- use of nonstandard expressions
- misuse of conjunctive adverbs
- long sentences
- miscellaneous grammar and style errors

**Scoring and Feedback Procedure**

Students were informed of the scoring procedure to be used in evaluating their analyses at the beginning of the semester and again prior to the submission of their first case analysis as follows: The case analyses are graded holistically. This means that the professor reviews the completeness of the analysis coverage, the content of the various areas of analysis, the clarity of the writing and organization, the logic and rationale and how well the student supports a position on strategy alternatives and recommendations (even thought he professor might not agree with your recommendations) and evaluate the entire report on the basis of “A+” (97-100), “A” (94-96), “A-“ (91-93), “A—” (89-90), “B” (88-85), etc.

The scoring and feedback procedure consisted of the following:

- The same professor scored each of the three case analyses and was kept purposefully unaware of any team’s section assignment and any research data until after all three cases had been scored.
- Each of the professor’s reviews included:
  - Standardized comments using Strategy Assistant
  - Comments that identified grammar or style errors using Edit Assist.
- Section 1 papers were returned to the teams with the Strategy Assistant and Edit Assist comments removed. These papers contained only the team’s score.
- Section 2 papers were returned to the teams with the Strategy Assistant comments removed. These papers contained the team score and comments from Edit Assist.
- Section 3 papers were returned to the teams with the Edit Assist comments removed. These papers contained the team score and comments from Strategy Assistant.
- Section 4 papers were returned to the teams with the team score, the comments from Strategy Assistant, and comments from Edit Assist.

**Data Analysis**

The research question addressed can be expressed as:

“What is the effect, if any, of automated and/or semi-automated computer generated feedback on students (teams) learning in a highly analytical and synthesizing environment?”
To address the question, the investigators used two computer programs developed for their class use, Edit Assist, an extensive document analyzer for grammar and style, and Strategy Assistant, a semi-automatic content feedback program, in a multi-section graduate MBA capstone course. The sections included a control section, a section exploring the effect of Edit Assist’s feedback, a section addressing the effect of Strategy Assistant’s feedback, and a section investigating the combined effect of feedback from both programs. A major focus of the research was to analyze team performance based on changes in case scores using four scenarios of feedback. The number of editing comments did not relate directly to average team scores except in the overall impression of the quality of the paper.

In section 1, the control group, students received only a grade for feedback. The data reflects that there was insignificant change in the grade performance of section 1 teams across the semester. The average number of Strategy Assistant comments increased slightly from 3.75 on case 1 to 4.5 on case 3. Although grade averages increased only .5%, there was a significant increase of 66.9% in the number of grammar and writing style errors detected by Edit Assist. As a major part of the case evaluation was based on content, it appears that, without feedback, little concern for grammar and writing style was expended (figure 3 and figure 7). [insert link to Figure3 Section 1 Received Team Score Only Feedback and Figure7 Percentage of Change in Team Grades by Section and Case]

In section 2, students received feedback containing the team score and comments generated from Edit Assist. Although the writing quality improved on each case, the value of content declined. It appears that feedback from Edit Assist reduced the number of grammar and writing style comments by about 40% across the three cases. This section’s average score remained a consistent 93.75 for the first two cases, but on case 3, their average score dropped to 88.75; thus, this section saw a grade average decrease of 5.3%. As all other sections achieved their highest grade on case 3, it appears that this section concentrated on reducing grammar and style errors and limited their effort in addressing this case’s content. These students may have perceived that with comments addressing only grammar and writing style, their efforts should focus on these areas (figure 4 and figure 7). [insert link to Figure4 Section 2 Received Team Score and Edit Assist Feedback.jpg]

In section 3, students received feedback containing the team score and the professor’s comments using Strategy Assistant. As grades were largely based on content and the professor’s comments addressed content issues, it was not unexpected that grade averages rose 5.2%. Comments on case 1 averaged 2.4 per team; whereas, comments averaged only 1.2 on case 2 and case 3. In addition, without feedback related to grammar and writing style, the number of errors rose from an average of 36 on case 1 to 47.75 on case 3 (figure 5 and figure 7). [insert link to Figure 5 Received Team Score and Strategy Assistant Comments.jpg and Figure 7 Percentage of Change in Team Grades by Section and Case.jpg]

In section 4, students received feedback containing the team score, the professor’s comments using Strategy Assistant, and comments generated from Edit Assist. This
section increased their average grade by 3.6%. The average number of professor’s comments decreased from 5.5 on case 1 to 3.5 on case 3 and the number of comments generated from Edit Assist averaged about 36 on all three cases. Grade performance was hampered as this section focused on grammar errors more than content on the first case. The first case returned an average of 1.5 professor’s comments and 48.5 comments concerning grammar and writing style. After the second case, students altered their focus to address content and their case grades improved (figure 6 and figure 7). [insert link to Figure 6 Section 4 Team Score, Strategy Assistant and Edit Assist Comments.jpg and Figure 7 percentage of Change in Team Grades by Section and Case.jpg]

**Conclusion**

The data generated by the study did support an answer to the research question posed: “What is the effect, if any, of automated and/or semi-automated computer generated feedback on student (team) learning in a highly analytical and synthesizing environment?”

**Content Feedback:**

The data indicates that semi-automated computer generated feedback using Strategy Assistant did increase team performance. Team case grades increased an average of 5.2% across the semester. As grades are biased to reflect content versus grammar, this was expected.

**Grammar and Style Feedback:**

The data relating to teams receiving only computer-generated grammar and style feedback (plus a grade) indicates that team performance concerning grades declined by 5.3%; although, grammar and writing style errors were reduced by 40%. It appears that without feedback concerning content, teams were unable to focus on content improvement. As grades are biased to reflect content versus grammar, this was not unexpected. It was interesting to note that in each section, the case receiving the lowest grade also contained the highest number of comments from Edit Assist.

**Content plus Grammar and Style Feedback:**

Teams receiving a grade, and comments from Strategy Assistant and Edit Assist increased their average grade by 3.6%. Grade performance was hampered when this section focused almost exclusively on grammar errors on the first case. The first case returned an average of 1.5 comments from Strategy Assistant and 48.5 from Edit assist. After the second case, students altered their focus to address content on the third case. Further research into the effectiveness between professor interlinear notes, which by necessity are relatively cryptic, and the more detailed feedback possible with automated feedback would likely provide additional insight to professors’ in their quest to create the best possible learning environment for their students.

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References
