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# What Do You Mean I Got a D+?

## Effects of Feedback on Metacognition, Motivation, and Academic Performance in High School Students

Daisuke Katsumata IDP

Faculty Advisors: Professors Dina Anselmi & David Reuman

Community Partner: Ms. Debra Avery, Hartford Magnet Trinity College Academy

### Introduction

**Background:** This project is a collaboration with Ms. Debra Avery, who teaches at HMTCA. She is interested in developing ways to further motivate student learning.

**Prior Research:** Past research has shown that among students who received only grades, comments and grades, or only comments, students who received only comments had the highest academic achievement (Butler, 1988). Other studies involving feedback with only comments were similarly successful across various ages, ability levels, and school subjects (Black & Wiliam, 1998; Hattie & Timperley, 2007).

**What is Metacognition?** Awareness and control over one's own thoughts and learning strategies, with increases in academic performance and motivation.

**Project Design:** Project Design: Two groups of 9-12th grade students taking a world history unit on WW II (four week session). The Enhanced Feedback group received extensive comments on unit assignments but no grades. The Standard Feedback group received grades and minimal comments on unit assignments. All feedback was provided by Ms. Avery.

#### Research Questions:

1. Do enhanced feedback and withholding grades (Enhanced Feedback) improve student metacognition, motivation, and academic achievement more than standard feedback and grades (Standard Feedback)?
2. Does Enhanced Feedback increase intrinsic motivation more than Standard Feedback?

### Results and Discussion

Measures	Academic Achievement	Intrinsic Motivation		Feedback
	WW II Unit Test	Extrinsic Goal Orientation	Control of Learning Beliefs	Feedback Perception
Hypotheses	Enhanced Feedback (EF) will improve student academic achievement more than Standard Feedback (SF).	Enhanced Feedback (EF) will improve intrinsic motivation more than Standard Feedback (SF).		Positive perceptions about feedback will be connected with any improvements in student metacognition, motivation, and academic achievement.
Example Questions	Germany attacked lands to the: A. North only; Denmark and Finland. B. South only; Austria and Czechoslovakia. C. West only; France and Belgium. D. East only; Poland and Soviet Union. E. All directions.	The most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting a good grade.  <1> Not at all true of me to <7> Very true of me	If I study in appropriate ways, then I will be able to learn the material in this course.  <1> Not at all true of me to <7> Very true of me	When you receive feedback on your assignments from Ms. Avery, are you frequently clear on if your work matches what Ms. Avery expects?  <1> Never to <5> Always
Graphs				
Results	Students given EF showed a greater increase in improvement on the WW II Unit Test from pre-test to post-test compared to students given SF. This result was significant. No effect of feedback on metacognition was observed.	Students given EF showed a decrease in Extrinsic Goal Orientation from pre-test to post-test, while students given SF remained relatively unchanged. These differences only approached significance.	All students started out with similar learning beliefs. From pre-test to post-test, students given EF declined in their feeling of control over their learning, while students given SF increased. These differences were significant.	All students started out with similar perceptions of feedback. From pre-test to post-test, students given EF declined in their positive perception of feedback, while students given SF increased their positive perception. These differences only approached significance.
Interpretations	All students learned over the course of the WW II unit. However, EF may have allowed students to learn the material more effectively.	It is plausible that withholding grades led students who received EF to place less importance on grades.	Withholding grades may have led students who received EF to believe that they have less control over their learning in the classroom.	Improvements in performance or intrinsic motivation may precede changes in perception of something as complex as a new type of written feedback.

### Enhanced Feedback

### Standard Feedback

### Acknowledgements

I would like to extend my deepest gratitude to Professors Dina Anselmi and David Reuman for their dedication to this study, and to my community partner Ms. Avery for providing her class time and wisdom. This study would not have been the same without her flexibility and ingenuity. I would also like to thank the participants in the Community Research Fellows Program, the Metacognition Research Lab, and Professors Carol Clark and Diane Zannoni for helping me communicate my research.

### References

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice*, 5(1), 7-74.

Butler, R. (1988). Enhancing and undermining intrinsic motivation: The effects of task-involving and ego-involving evaluation on interest and performance. *British Journal of Educational Psychology*, 58(1), 1-14.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112.

No grade provided.

Feedback that directly addresses how the student fared relative to the main goals of the assignment (not shown).

These comments point out the positives of the student's work.

This particular student did very well on this assignment, but there are still specific suggestions for improvement.

Handwritten notes on the Enhanced Feedback work: "Good summary of V2 bombs and pros:llin", "Excellent choice of topics and key facts", "Graphics and 3-D itans made the paper 'pop', very inviting 'pop', but not quite", "Includes source/Bibliography but not quite".

### Recommendations

- Schools should be open to changing the way students are evaluated by deemphasizing grades and providing them with more targeted elaborate written feedback (Enhanced Feedback).
- Future studies should include more classes for a larger sample size and observing them for a longer duration may allow for the detection of more effects of Enhanced Feedback.
- Student self-report measures of intrinsic motivation and perceptions of feedback may be related to levels of overall metacognition. A future study that incorporates an intervention targeted at improving metacognition alongside an intervention providing Enhanced Feedback may find improvements in student metacognition and motivation in addition to even greater improvements in academic achievement.