



The Efficacy of a Concept-Based Studying Method for Introductory Psychology Students

Evan M. Kleiman and Robert W. Weisberg

Department of Psychology, Temple University, Philadelphia, PA



Introduction

There are a myriad of ways for a student to go about preparing for test and quizzes. Everything from reviewing notes to creating flashcards to writing possible answers on ones' own hand in the minutes before the test are available in the toolbox of the college student. Regardless of the method, it is undeniable that studying is an essential component for any student wishing to see academic success. Transitioning from high school to college can be difficult. New students want to take as many memories of their high school career with them. Some bring pictures and trophies, but along with the sentimental items from a life in high school come old studying methods and techniques. For many in high school, it was acceptable to memorize facts in order to pass the exam. However, college is a beast of a different nature. Casually speaking, it is crucial to understand a concept rather than memorize the meanings around it. Because of this requirement, I suggest and test a concept-based method of studying.

Of course casual observation alone is not enough to warrant scientific action. In that regard, looking at the scores of the class from previous semesters offered some empirical backing for a study-skills intervention. The first exam, given in the Fall 2007 semester to approximately 600 students enrolled in Temple University's Introductory Psychology course, featured a multiple-choice format with four possible answers per question. Four students who took this exam managed to get scores of 24% or less. This means these students scored worse than chance. Had they guessed randomly, probability would dictate they would score at least a 25%.

The Study Lesson

The central tenant of the study session involved telling the students that in order for them to learn the material, they needed to take the information from class and the textbook and make it personal. Cleverly enough, the first example term I introduced during the session was "schema". I explained to students how I took the book definition of the word ("Integrated pattern of knowledge stores in memory that organizes information and guides acquisition of new information", (Kowalski & Westin, 2005)) and turned it into my own personal definition ("Your blueprint for creating new ideas"). This example served as a good segue to tell the students that they needed to establish their own schema for the words. Creating a concept for a psychology term stems from the notion of Self-Referential Encoding (Rogers, Kuiper, & Kirker, 1977). The self-reference effect infers that students would be more likely to remember and understand what they studied if they made the material personal.

I introduced the concept of rote memorization as one to avoid. There are many ways a student could use this strategy in their efforts to prepare for a test. Such examples could be repeatedly reading and memorizing the definitions in the book to "cramming" and attempting to memorize as much material as possible the night before the exam. Chissom and Iran-Nejad (1992) conducted a review of four different study skills commonly used by undergrads in an introductory psychology course and the efficacy of each skill. The study reported that rote memorization (using a similar operational definition to mine) was found to have no effect in increasing a student's score on a test.

Studying in groups is a skill often used by Introductory Psychology Students (Balch, 2005). In my study skills session, I stressed that studying in groups could be useful if executed at the correct time. I told the students to study in groups after they first studied on their own. This would allow the students the chance to figure out which concepts they understood well enough to personalize and internalize and which concepts with which they would need their peers' help.

Discussing studying in groups was a good segue to my next point of the efficacy of peer teaching. Helman and Horswill (2002) show that studying in groups relies on Vygotsky's principal idea of scaffolding. In the session, I mention that in order to effectively explain a concept to someone else, one must understand that concept already and that teaching a concept to someone else is a good test of whether or not the student knew the concept himself. I closed this section with the causal point that I often felt by teaching someone else the material, I would end up learning the material better than I would by just studying. Table 1 shows a breakdown of the major concepts of the study skills session

This study attempts to find that a set of students, randomly selected to receive a lesson in this study technique will score higher on an Introductory Psychology exam than a group of students who did not. This study also attempts to find that students in a second cohort who are randomly selected to receive the study skills lesson after they have taken the first exam will show a larger increase in score between the first exam and a second exam compared to a similar group that did not receive the study skills lesson.

Table 1. The Main Principles Utilized During The Session

Principle	Concept	Major Point
Creating your own schema for the word	Self-referential encoding	"You are not the textbook authors. Make it personal and you're more likely to remember it!"
Don't memorize	Rote memorization	"You don't understand the concept if you just memorize it. If you don't understand the concept, you can't pass the test."
Studying in Groups	Scaffolding	"The best person to teach something is someone who knows slightly more than you."
Teach it to someone else	Scaffolding	"You can't teach something to someone unless you've first mastered it yourself."

Chart 1. Changes in Scores from Exam 1 to Exam 2

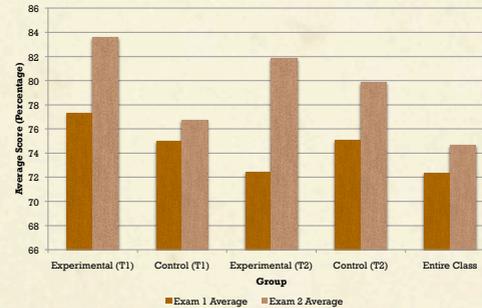


Table 2. Significance of Change in Scores

Group	df	Significance
Experimental (T1)	19	.42
Control (T1)	23	.18
Experimental (T2)	11	.19
Control (T2)	21	.94

Methods

Students were randomly-selected from a subset of the general population of Temple University's Introductory Psychology course (N = 417). An email was sent 10 days before the exam to the entire class announcing the study session and requesting interested students to reply to the email. Half of the students who responded before the first test (n = 26) were randomly selected to be told which room the tutoring would be held in and when to attend. The other half of the students were told there was not enough room for them in that particular tutoring session, but that they would be considered first for the next round of sessions. The rejected group was then used as a control. Before the second exam, 66% (n = 22) of the students who responded to the email were randomly put into the experimental group as opposed to 50% from the previous time. Accepting a higher amount of students accounted for a low attendance rate from the previous round.

Four study sessions were held during the week before each of the two tests. The times of the four study sessions were scattered throughout a two-day period in an effort to accommodate as many students' schedules as possible. The sessions lasted approximately 15 minutes with a few minutes for questions at the end. The main points of the presentation (as described in the introduction section of this paper) were presented on an Apple MacBook connected to a projector using Apple's Keynote 2008 software.

Results

For initial analysis, the mean test percentage of each of the four groups as well as the class as a whole was calculated for exam 1 and exam 2. Percentage of change in score from exam 1 to exam 2 was also calculated for all four groups and the class as a whole. Chart 1 details the change in mean scores between and within the groups.

The differences in scores for all four groups were then tested using a paired-samples t-test and were found to be nonsignificant. There was no significant difference between exam 1 and exam 2 average for the first cohort control group

Discussion

While no significant difference was found, this study should still be considered a success rather than a failure. With that said, a just noticeable difference was found when looking at increase of scores between the experimental groups compared to the control groups. For this type of study, it would be almost unrealistic to expect a significant difference. It would not be reasonable to expect a 15-minute study session to bring failing students to the top of the class. A two-fold increase in grades when comparing the experimental and control groups from time two (6.37% increase compared to 12.93%) is encouraging. It is also interesting to note that there was a larger percent change in both of the second-round groups. One might think that poor performance on exam 1 would serve as a motivating factor to the students in either group of exam 2. While of course the scores are not necessarily different between the students from time 1 and time 2 overall on exam 1, poor performance is a subjective experience. So, if a student were unhappy with his grade on exam 1 (even if it were in fact above average for the class), that student might be more likely to seek out additional help outside of the lecture all before the next exam. This might suggest that timing is another important factor with the study-skills lesson. Perhaps a student must do (subjectively) poorly before he would be motivated to attend and utilize a study session.

Limitations

There were several limitations in this study that should be corrected in future attempts to assess the efficacy of the studying method. First, the sample size was rather small, with only 32 students out of almost 500 receiving the study session. There was also still a self-selection effect since to be considered for either group, the students needed to first volunteer to attend the study sessions. A follow up of this study has been proposed that would involve randomly assigning the small recitation sections to receive the lesson during class time instead of having the students volunteer. This would remove any self-selection effect and expose more students to the study session. Lastly, there was no way to actually assess if the students were using the study method, or if they even understood it in the first place.



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References

Balch, W. R. (2005). Study Tips: How Helpful Do Introductory Psychology Students Find Them? *Teaching of Psychology*, 27(1-2), 100-101.

Chissom, B., & Iran-Nejad, A. (1992). Development of an instrument to assess learning strategies. *Psychological Reports*, 71 (3), 1091-1091.

Grasha, A. (1998). Add Added 'Giving psychology away': Some experiences teaching undergraduates practical psychology. *Teaching of Psychology*, 25 (2), 85-88.

Helman, S., & Horswill, M. (2002). Does the introduction of non-traditional teaching techniques improve psychology undergraduates' performance in statistics? *Psychology Learning & Teaching*, 2 (1), 12-16.

Kowalski, R., & Westin, D. (2005). *Psychology* (4 ed.). New York: Wiley.

Mayo, J. (2003). Observational Diary: The merits of journal writing as case-based instruction in introductory psychology. *Journal of Constructivist Psychology*, 16 (3), 233-247.

Rogers, J. B., Kuiper, N. A., & Kirker, W. S. (1977). Self-Reference and the Encoding of Personal Information. *Journal of Personality and Social Psychology*, 35 (9), 677-688.

Figure 1: Example Slides from the Study Session Illustrating the Main Points of the Lesson