

Title: A Drop Dead Review of a Couple of Stiffs I Know (A Pilot Study: Using Deep Thought Processing for Better Learning)

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Proposal: According to Chew (2014), applying deep thought processing questions in the classroom as opposed to shallow strategy questions is more likely to yield successful learning outcomes at the undergraduate level. Hypothesizing similar differences at the masters level, a cohort of Human Gross Anatomy students was tested with cognitively active questions supplemented by cognitively passive questions and compared to observe differences in performance.

Adopting a quasi-experimental approach with non-equivalent groups, 22 graduate students were divided into two tutorial groups. Group 1 attended lab for six hours a week and a one hour tutorial involving both active and passive questions. Group 2 followed the same regimen but was given only passive questions. Both groups took a midterm lab practical exam. For the second four weeks, the procedure was reversed before a final exam was administered. Each exam measured similar categories of knowledge.

The resulting data confirmed our expectations. Group 1 exhibited 19.25% higher midterm scores than Group 2 (83.34% vs. 64.09%). Following the midterm, group treatment was reversed resulting in a final score difference of only 7.48% (81.20% vs. 73.72%). Collectively, these results prompted further statistical analysis.

In order to evaluate the statistical significance of the data, paired sample t-tests, ANOVA and ANCOVA were selected. Paired sample t-tests were used to evaluate differences *within* groups while ANOVA and ANCOVA were used to determine differences *between* the non-equivalent groups. ANCOVA was used to analyze final grades to reduce the effects of previous exposure.

Paired Samples T-Test

Group 1 did not experienced significant difference in scores after cessation of treatment.

Group 2 experienced an increase in scores after addition of treatment. Though not definitively significant, a p-value of 0.058 suggests an increase in subjects would yield significant results.

ANOVA

Group 1 experienced a significantly higher midterm score than Group 2 .

ANCOVA

After both groups had received treatment, there was no significant difference in final scores.

Overall, the results of the analyses would seem to indicate that the early application of the treatment to Group 1 resulted in more beneficial results than the late application to Group 2 following the midterm and gains were not lost over time. Ultimately, the analyses denotes the use of deep thought processing questions in human cadaver labs at the masters level to improve learning outcomes significantly and should be implemented to increase long term memory and mastery of the subject.