

Poster Title: Applying the Learning-By-Teaching Method in a Classroom Setting

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Abstract

It has been determined that there are many different ways to learn. Learning-by-teaching is a generative learning strategy and will be the main topic for the current research. The learning-by-teaching literature is very scattered in its approach. Some of the research has focused on showing the effect in a lab setting (e.g., Annis, 1983; Bargh & Schul, 1980; Fiorella & Mayer, 2013; Fiorella & Mayer, 2014; Hoogerheide et al., 2016; Hoogerheide et al., 2014; Herberg, Levin, & Saylor, 2012; Nestoiko, et al., 2014), while other research has focused on determining if teaching TAs using computer software can produce increased learning gains (Biswas et al., 2005; Chase et al., 2009; Okita & Schwartz, 2013), and others have taken it a step further to focus on finding learning-by-teaching in the workplace (Gregory et al., 2011; Lee et al., 2014, Tang et al., 2004). There are mixed results within the learning-by-teaching literature (Annis, 1983; Bargh & Schul, 1980; Hoogerheide et al., 2016; Herberg, Levin, & Saylor, 2012) . The goal of the present research will be to determine if isolating the learning-by-teaching method in the classroom can produce positive learning results.

The participants for the current study will be students from the Fall 2019 Introduction to Industrial-Organizational Psychology class, at Middle Tennessee State University. Students will complete a homework assignment on both Taylor Russell tables and Training ROI. They will then have a test on this material. Students will then be randomly assigned to one of two conditions; Taylor Russell tables or Training ROI. Students will be given approximately three weeks to complete the homework assignment of creating a video of them teaching the material they were assigned. Approximately 5 weeks after the first exam students will then be given a second exam that will include questions on both Taylor Russel tables and Training ROI.

The researchers anticipate that students will perform better on the test questions on the subject that they were required to teach. Students who create higher quality videos are likely to have higher learning gains on the topic they taught. Finally, the researchers anticipate that students who spend more time creating their videos will exhibit higher learning gains.

Detailed Methods Section

The current research will evaluate the following hypotheses and research question:

Hypothesis 1a. Students that engage in the learning-by-teaching method for Content A (Taylor-Russel tables will exhibit higher learning gains related to Content A (Taylor-Russel tables) than those that did not.

Hypothesis 1b. Students that engage in the learning-by-teaching method for Content B (Training ROI) will exhibit higher learning gains related to Content B (Training ROI) than those that did not.

Hypothesis 2. Students will have higher learning gains on material in which they engage the learning-by-teaching strategy compared to the material in which they study.

Hypothesis 3. Students who create high quality videos will exhibit higher learning gains when compared to students who have low quality videos. A high-quality video will be determined by setting a cut-off score on the behaviorally anchored rating scales (BARS).

Hypothesis 4. Students who spend more time making their videos will exhibit higher learning gains when compared to students who spent significantly less time making their videos.

Research Question: Are learning gains on the exam correlated with learning gains on the homework assignment?

In the experimental study, all students will be presented with information in class on Taylor Russell tables and Training ROI. Students will then complete two, ten point homework assignments; one on the application of Taylor Russell tables and one on the application of Training ROI. After completing both homework assignments students will take an exam that will have questions relating to both Taylor-Russel tables and Training ROI. The results on the questions will provide a baseline score for each student on their knowledge of each topic.

After exam 1, students will be randomly assigned to one of two conditions: teaching Taylor-Russel tables (Content A) or teaching Training ROI (Content B). The two conditions were determined to be similar in difficulty. Students will be given approximately three weeks to complete the homework assignment of creating a video of them teaching the material they were assigned. Students will be instructed to fill out a time-log detailing how much time they spent on the assignment. When turning in their video, students will be instructed to fill out a post-experimental survey, that will assess their motivation and engagement during the assignment.

After completion of the video assignment, students will be given a second homework assignment on Taylor-Russell tables and Training ROI. If the student performs better on this second homework pertaining to Taylor-Russell tables and/or Training ROI, then it will replace the grade they received on the first homework assignment. This will be an additional way in which the researchers can assess if a learning gain was made by the manipulation. Approximately 5 weeks after the first exam students will then be given a second exam that will include questions on both Taylor Russel tables and Training ROI. Then, approximately 1 week later, students will be given a third exam that will include questions on both Taylor Russel tables and Training ROI. The third exam is not required, but will allow us to capture missing data for students who did not take the second exam.