Transforming College Success: Making Learning Meaningful to At-Risk Students

Abstract

The Teaching for Transformative Experience in Science (TTES) model has proven to be effective for facilitating learning and engagement in science (Authors, in submission; Pugh et al., 2010a). The present study explores the influence of TTES on learning, out-of-school engagement, affect, and interest with educational psychology topics in a college success course taught by teaching assistants. TTES was compared to an experiential teaching method in a course designed for academically at-risk undergraduate students. As predicted, TTES facilitated significantly higher transformative experience, achievement, positive affect, and interest; while reducing negative affect. The findings have important implications for facilitating learning, engagement, and interest in academically at-risk college students as well as increasing teacher assistant effectiveness.

Introduction

Many first-year college students find themselves ill-equipped for the academic challenges they face as they transition from high school to college, increasing the risk of academic failure (Brinkworth, McCann, Matthews, & Nordstrom, 2009; Raths, 2009). Several higher education institutions offer college success courses in order to increase student achievement, adjustment, and retention (e.g., Tuckman & Kennedy, 2011). The purpose of the present study was to explore the effectiveness of the Teaching for Transformative Experience in Science (TTES) model for facilitating transformative experiences, learning, and positive emotions and interest in a college success course. This extends prior research on the TTES model as it has not being employed in topics outside of biological science. In this study, we explored the effectiveness of TTES for
teaching about a topic in the learning sciences; memory and learning. Improving the effectiveness of college success courses has implications for student success and retention.

**Theoretical Framework**

**Transformative Experience.** Transformative experience (TE) is a type of learning that occurs when students apply what they have learned in the classroom to their everyday life (Pugh, 2011). Specifically, TE is conceptualized as a continuum of engagement from high in-school engagement (relating concepts to everyday experience during class) at the low end and high out-of-school engagement (actively using the concept while watching TV) at the high end. TE is comprised of three dimensions including: (1) active use, (2) expansion of perception, and (3) experiential value. Pugh et al. (2010a) developed an instructional approach to facilitate TE called the Teaching for Transformative experience in Science (TTES) model which includes (1) teaching for value, (2) modeling transformative experiences for the student, and (3) scaffolding the students’ TE. TTES was the approach investigated in the present study to improve student learning and engagement.

**Topic Emotions.** Academic emotions play an important role in learning (Pekrun, 2002a). Specifically, positive emotions are associated with better learning outcomes (Pekrun, 2006). If students have negative emotions about classes designed to promote academic success, the courses may be less effective. In this study, we explored topic-specific academic emotions (Broughton et al. 2011). Topic emotions are those regarding a specific topic or concept (Authors et al, in press) rather than an entire domain (Pekun, 2006). In the present study, we explored the topic emotions directly related to the concepts targeted by our intervention.
**Interest.** Student interest has been shown to have a positive impact on learning and engagement (Hidi & Renninger, 2006). Engaging students in TE may be an effective method for generating student interest in the topic by increasing perceived value. The current study explores the effectiveness of the TTES model for facilitating student interest.

**Research Questions and Hypothesis**

Four research questions were addressed: (1) Would TTES instruction facilitate significantly higher levels of TE than those in a comparison group? (2) Would TTES instruction facilitate greater achievement? (3) Would TTES influence topic emotions? (4) Would TTES facilitate higher levels of interest?

**Methods**

**Participants**

Participants were 46 students (23 in each condition) enrolled in a college success course at a large southwestern university. Students were required to enroll in the course if admitted to the university with an at-risk categorization as determined by SAT scores and high school GPA. All students in the course were taught together in a lecture and then attended one of 4 labs, each instructed by different teaching assistants (TA). Assignment to lab groups was random. There were 21 males and 25 females. Students reported their ethnicity as follows: 6 Asian, 6 African American, 19 Caucasian, 13 Hispanic, and 2 other. The class had 41 freshmen, 4 sophomores, and 1 senior.

**Materials**

**Transformative Experience Survey.** The instrument used to measure students’ engagement in TE included 20 Likert-scale items (Pugh, et al., 2010a). The survey was
administered at the conclusion of the intervention. Items asked students about the degree to which they applied the concepts learned in class to their out of class experience. Participants were asked to agree or disagree to statements using a 6-point scale.

**Memory Knowledge Quiz.** This instrument contained 10 multiple-choice questions regarding memory concepts related to the information processing theory. The scores were averaged for each group to compare across conditions. The Memory Knowledge Quiz was administered at pre, post, and delay (of 17 days).

**Memory Interest Survey.** This survey contained 4 questions regarding each group of concepts. Participants were asked to rate their interest regarding a concept on a 5 point Likert scale. Scores were summed for each group for comparisons.

**Topic Emotions Survey.** Emotions regarding the memory concepts were assessed at posttest using a modified version of the Topic Emotions Survey (Broughton et al., 2011). There were 15 emotions measured including enjoyment, anger, and frustration. The extent a participant felt an emotion was assessed on a 5 point Likert scale. Scores were averaged for each emotion and compared across condition.

**Procedures**

The college success course met twice a week. The first weekly session was a required lecture. The second was a laboratory session where students engaged in activities related to the lecture material. The 4 labs were taught by 4 different doctoral student TAs. Two of the TAs were randomly chosen by coin flip to teach the treatment, the remaining two taught the comparison. The treatment instructors were taught how to implement the TTES model. The memory concepts’ lesson contained the following: serial position effect, episodic memory,
procedural memory, semantic memory, non-declarative memory, flashbulb memory, and theories of forgetting. The material was taught over three 30 minute sessions in both the treatment and comparison for 3 consecutive weeks in each lab.

**Treatment Groups.** On Day 1, the students completed pretest instruments. This was followed by a PowerPoint lecture regarding the memory concepts, enhanced by the components of the TTES model. While teaching the material, the instructors emphasized the three dimensions of TE including experiential value, expansion of perception, and active use. The instructors then suggested that the students look for examples of the memory concepts in their everyday experience. On Day 2, the treatment condition engaged in a whole group discussion regarding the TEs the students engaged in over the weekend. The instructors modeled their own TEs and then asked students to share. The students provided examples of their experiences with the memory concepts. The instructor then scaffolded the students’ experience and discussed how their example fit the three dimensions of TE. Once again, the instructors suggested that the students look for examples of the concepts in their everyday experience over the weekend. On Day 3, the instructors conducted a discussion similar to that which occurred on Day 2, followed by the posttest instruments. As the final step, 17 days later, the students took a delayed memory knowledge quiz.

**Comparison Groups.** On Day 1 in the comparison groups, the students received the pretest instruments and a lecture based on the same PowerPoint as the treatment except the instructors did not discuss the three dimensions of TE. Rather, the instructors provided rich examples of each concept and stated that the class would engage in an activity and discussion regarding the material in the following week. On Day 2, the instructors of the comparison group facilitated an activity which consisted of reading a situation of a person experiencing each
concept and a discussion of the person’s experience. This activity was meant to be experiential and therefore comparative to the treatment condition. The major difference was that the instructors were discussing someone else’s experience rather than discussing their own and the students. On Day 3, a similar activity and discussion occurred, followed by the posttest instruments.

**Results**

**Transformative Experience Findings.** A univariate analysis of variance was conducted on the TE survey. The treatment group scored significantly higher on the TE scale than the comparison group (Treatment $M = 81.69, SD = 17.19$, Comparison $M = 68.00, SD = 13.28$), $F(1, 44) = 9.13$, $p = .004$, $\eta^2 = .17$. The effect size was large. These findings suggest TTES facilitated significantly greater levels of transformative experience than the comparison.

**Knowledge Assessment Findings.** A repeated measures analysis of variance (ANOVA) was conducted to assess knowledge. The results revealed that the interaction between time and group was significant, $F(1, 44) = 10.78$, $p = .002$, $\eta^2 = .20$ (see Figure 1). The effect size was large. To examine the nature of the interaction, simple effects were examined for Memory Knowledge Quiz, pretest versus posttest. Pretest scores did not differ between the two conditions (Treatment $M = 4.47, SD = 1.72$, Comparison $M = 4.00, SD = 1.34$), $F(1, 44) = 1.09$, $p = 0.30$. However, posttest scores were significantly greater for the TTES group ($M = 8.87, SD = 1.32$) than the comparison group ($M = 6.78, SD = 1.65$), $F(1, 44) = 22.37$, $p < .0005$, $\eta^2 = .34$, again indicating a substantial effect size. Finally, the delay test scores were significantly greater for the TTES group ($M = 8.82, SD = .94$) than for the comparison group ($M = 6.61, SD = 1.64$), $F(1, 44) = 31.57$, $p < .0005$, $\eta^2 = .41$, exhibiting a large effect size. These results show that TTES
resulted in greater achievement in the treatment group, than the comparison at posttest and a delay.

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<th>Pretest</th>
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<td>7.62</td>
<td>6.65</td>
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<tr>
<td><strong>Comparison</strong></td>
<td>2.43</td>
<td>3.62</td>
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**Figure 1**: Average score of the treatment group and the comparison group for the Memory Knowledge Quiz at pretest, posttest, and delay test (N = 46).

**Emotions Findings.** A univariate ANOVA was conducted for each emotion on the Topic Emotions Survey. Two of the emotions, enthusiasm and dullness, showed significant results.

The treatment group scored significantly higher on enthusiasm than the comparison group (Treatment $M = 3.04$, $SD = .87$, Comparison $M = 2.43$, $SD = .59$), $F(1, 44) = 7.62, p = .008, \eta^2 = .15$ suggesting a large effect. Further, the comparison group scored significantly higher on dullness than the treatment group (Comparison $M = 2.30$, $SD = .92$, Treatment $M = 1.65$, $SD = .71$), $F(1, 44) = 7.15, p = .01, \eta^2 = .14$ again exhibiting a large effect. The results suggest that the treatment participants were more enthusiastic about learning and perceived less dullness.

**Interest Findings.** A univariate analysis of variance was conducted on the Memory Interest Survey. The treatment group scored significantly higher on the interest survey than the comparison group (Treatment $M = 14.13$, $SD = 2.78$, Comparison $M = 12.08$, $SD = 1.97$), $F(1,
44) = 8.24, \( p = .006, \eta^2 = .16 \) suggesting a large effect. These findings suggest that TTES facilitated significantly higher levels of interest than the comparison.

**Discussion**

Our results suggest that the TTES model successfully promoted TE when learning about memory in a college success course. This is an important finding because it is the first time that TTES has been used successful on a subject outside of the biological sciences. Further, the TTES condition advantage maintained at delayed post. Theory suggests that engaging in TE supports learning and retention.

TTES participants also scored higher on enthusiasm and lower on dullness. This suggests that students enjoyed learning through the TTES method. Further, participants in TTES scored significantly higher on a measure of interest than the comparison. The fact that students were interested and reported positive affect regarding material learned in a college success course is an important finding. Facilitating interest in these courses may increase the likelihood that the students will apply learning strategies essential for college success (Hofer & Yu, 2003; Nordell, 2009). The findings offer important implications for universities seeking to improve the academic performance and retention of at-risk students.
References


