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Strategies to Alleviate Test and Mathematics Anxiety

Are the anxiety-reduction techniques of the use of humor or visualization effective at reducing students' test and mathematics anxiety?

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ABSTRACT

The purpose of this study was to determine the effectiveness of two anxiety-reduction techniques in a 7th grade Tier 2 (average) mathematics classroom. Based on the work of Ford, Ford, Boxer, and Armstrong (2012), one of the techniques used was the use of humor. The other technique is the use of visualization (see Shobe, Brewin, & Carmack, 2005). Ultimately, this study sought to determine if either of the anxiety-reduction strategies lowered student’s anxiety; if they were effective, which was more effective; and if the strategy had any apparent effect on the students’ academic performance.

METHODOLOGY

Two classes were used in this study and the study was broken into two rounds. In the first round, Class A was introduced to the anxiety-reduction technique of “the use of humor” while Class B was a control group. In the second round, Class B was introduced to the anxiety-reduction technique of “the use of visualization” while Class A was the control group.

Effectiveness of the techniques was measured in two ways. First, students took Likert scale evaluations throughout the study period to assess their trait anxiety and their state anxiety during and after quizzes and tests. These evaluations were used to compute students’ anxiety scores, which were compared to determine if there was a significant difference in students’ anxiety without the introduction of anxiety-reduction technique and during the use of an anxiety-reduction technique. Second, students test and quiz scores were examined for significant differences between when the students used an anxiety-reduction technique and when they did not.

The overall effectiveness of the techniques were examined from the holistic standpoint of an educator and through a t-test (α = 0.05).

ANXIETY-REDUCTION TECHNIQUES EXPLAINED

The Use of Visualization

This strategy is based on the work of Shobe, Brewin, and Carmack (2005). It is accomplished by asking students to visualize (imagine) a place, feeling, or event/action which is safe, relaxing, or enjoyable prior to their high-stress task (test or quiz). The process used in this study is based on the process outlined by Sichel (2004), which was also used by Shobe, Brewin, and Carmack. It begins with deep breathing exercises, then progresses to muscle relaxation through flexing and relaxing the muscles, and finally culminates with visualization a safe place, feeling, or action/event.

The Use of Humor

This strategy is based on the work of Ford, Ford, Boxer, and Armstrong (2012). It is accomplished by showing students a humorous cartoon prior to their high-stress task (test or quiz). See cartoons used below.

RESULTS

Figure 1: Class Grades by Groups

Figure 2: Gender by Groups

Figure 3: Quiz State Anxiety Change

Figure 4: Test State Anxiety Change

Figure 5: Scope of Trait Anxiety by Group

Figure 6: Average Grades on Assessments

Figure 7: t-Test Results for Assessment Scores

Figure 8: t-Test Results for Assessment State Anxiety

CONCLUSIONS

The t-test results for the anxiety scores (Figure 8) indicate that the anxiety-reduction technique of the use of visualization is effective. This supports the findings of Shobe, Brewin, and Carmack (2005). However, these t-tests also indicate that the anxiety-reduction technique of the use of humor is ineffective, which contradicts the findings of Ford, Ford, Boxer, and Armstrong (2012).

While the use of visualization may have been effective at reducing students’ anxiety, it did not, according to the t-tests for assessment scores (Figure 7) make any significant difference on students’ assessment scores, nor did the use of humor. This creates a conundrum: visualization does seem to reduce student anxiety, but it doesn’t necessarily affect students’ assessment scores, which is where anxiety-reduction techniques could, arguably, be the most useful.

However, there are a few more factors which should be considered. Group A tends to score better on assessments (Figure 6) and is comprised of more high-achieving students (Figure 1). This could have impacted the scores for the assessments enough that no significant evidence of Group B attaining higher scores could be found. Additionally, based on the higher scores from both groups on Test 2 as compared to Test 1 (Figure 6), it could be suggested that the tests were not comparably difficult. Finally, Group A is also comprised of more anxious students (i.e. more severely anxious students compared to no severely anxious students in Group B—see Figure 5) and therefore may not be as receptive to the anxiety-reduction techniques.

Conversely, from the holistic viewpoint of an educator, reduced anxiety in a mathematics classroom is still notable and worthy of future trials so that all students’ needs can be met.

REFERENCES


