Enlightened Education: Evaluating Classroom Inversion and Mutual Engagement in Chemistry and Biology

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An experiment was performed at a residential high school incorporating the concepts of Mutual Engagement (ME) and classroom inversion along with the three most common teaching methods. Mutual Engagement is a concept that brings group work into the classroom. Classroom inversion includes students obtaining one-on-one time with their instructor by working problems inside the classroom and reading textbook material outside the classroom. This project investigated the possibility of Mutual Engagement and classroom inversion having more of a positive impact on 11th and 12th grade students' cognitive abilities when compared to the traditional methods of lecturing, multimedia demonstrations, and hands-on learning. These methods were compared in two Anatomy and Physiology classes and three Preparation for Chemistry classes. One Anatomy class and two Chemistry classes were control groups and were taught using the traditional teaching methods. The other Anatomy class was taught using Mutual Engagement, and the other Chemistry class was taught using classroom inversion over the course of one semester. The students' test and quiz grades were anonymously collected at the end of the semester to determine whether there was a statistical difference between the classes' grades and the corresponding teaching styles. Using two-sample t-tests, it was found that there was no statistical difference for Mutual Engagement in Anatomy, but there was a statistical difference for classroom inversion in Chemistry ($p<0.05$). These analyses suggest that classroom inversion improves students' performance on assessments in Chemistry.

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