| Name(s) | Project Number |
|---|---|
| **Ujjaini Mukhopadhyay** | **S0414** |

**Project Title**

## Mindset or Aptitude: What Drives the Learning Capability of High School Students?

**Abstract**

**Objectives/Goals**

The purpose of this study was to determine whether mindset or aptitude was better indicator of learning ability of high school students.

**Methods/Materials**

My AP Bio class participants were offered two short questionnaires to test their mindset and aptitude for abstract reasoning. The mindset questionnaire, based on Professor Carol Dweck's work, consisted of 20 statements and was scored on a 1-4 scale. Questionnaire II was an abstract reasoning test consisting of 10 questions. The participants were assigned an anonymous ID number by the teacher prior to the study. Then, they were given three Sudoku challenges in class on 3 days, 1 week apart. Each challenge was for 10 minutes. The level of the Sudoku challenge was fixed. They were allowed to practice Sudoku at home and report that. Each Sudoku was graded on the number of correct entries. Mindset was retested after Sudoku. Regressions were conducted to understand the effect of mindset and aptitude on the change of the Sudoku score.

**Results**

There were 51 participants. Based on the survey, majority were of growth mindset with some fixed ideas. Females scored higher on mindset while males scored higher on the Aptitude. Based on the t-test, participants with growth mindset scored higher than those with fixed mindset at the same aptitude level ($p=0.01$). For the approaching-proficiency participants, based on the regression analysis ($R2=0.69$), mindset had a significant negative correlation ($p=0$) to growth and insignificant positive correlation ($p=0.21$) to aptitude. Finally, based on regression ($R2=0.47$), new learners (who scored less that 10 correct on first trial), had a significant negative correlation ($p=0.01$) with mindset and insignificant negative correlation ($p=0.17$) with aptitude. The conjecture is that the mindset scores of the participants were not reflective of their actual behavior (to try) because they were all high school students in AP Bio class. It was however observed that participants with high mindset score and lower aptitude score grew comparable to participants with fixed mindset and high aptitude. Women showed significant change in mindset after the Sudoku.

**Conclusions/Discussion**

People with growth mindset and high aptitude learn the most. Students with high aptitude but a fixed mindset performed worse in Sudoku than students with growth mindset. Mindset helps students learn new things and is a stronger predictor for learning.

**Summary Statement**

The project is to determine whether mindset or aptitude is a better predictor of learning ability of high school students

**Help Received**

The study was designed by me. I got help in understanding the data from Prof. Regina Langhout, Psychology Department, UCSC. Mr Cahn helped me conduct the study in class and parents helped me with display board.