

## Answer on Question #45590 – Math – Statistics and Probability

### Problem.

24. Rosalie Friend (2001), an educational psychologist, compared three methods of teaching writing. Students were randomly assigned to three different experimental conditions involving different methods of writing a summary. At the end of the two days of instructions, participants wrote a summary. One of the ways it was scored was the percentage of specific details of information it included from the original material. Here is a selection from her article describing one of the findings:

The effect of summarization method on inclusion of important information was significant  $F(2, 144) = 4.1032$ ,  $p < .019$ . The mean scores (with standard deviations in parentheses) were as follows: Argument Repetition, 59.6% (17.9); Generalization, 59.8% (15.2); and Self-Reflection, 50.2% (18.0). (p.14)

- a. Explain these results to a person who has never had a course in statistics.
- b. Using the information in the preceding description, figure the effect size for the study.

### Solution.

a. The mean score is average (arithmetic mean) of students result. The standard deviation measures the amount of variation or dispersion from the mean score.

b. The effect size (using Cohen's d) would equal

$$r = \frac{d}{\sqrt{d^2 + 4}},$$

where  $d = \frac{M_1 - M_2}{\sqrt{\frac{SD_1^2 + SD_2^2}{2}}}$ ,  $M_1$  and  $M_2$  mean values of the first and second dataset,  $SD_1$  and  $SD_2$

standard deviation of the first second data set.

Then for Argument Repetition and Generalization the Cohen's d  $d \approx -0.012$ , the effect size  $r \approx -0.006$ .

Then for Argument Repetition and Self-Reflection the Cohen's d  $d \approx 0.524$ , the effect size  $r \approx 0.253$ .

Then for Generalization and Self-Reflection the Cohen's d  $d \approx 0.576$ , the effect size  $r \approx 0.277$ .