Paired Study

The Effectiveness of Excellence Camp: A Study on Paired Sample

Abstract The Mathematics Excellence Camp was conducted to recap students' basic knowledge and expose students to the problem-based learning. In this study, the authors' research focus on the effectiveness of this educational camp in improving students' understanding in Mathematics. The camp was designed for students taking pre-Calculus for a second time. Each day, the students were given a pre-test before the lesson began and post-test after the lesson ended. The different mean values for pre-test and post-test were analyzed using a paired sample t-test. The results of the study showed a higher mean post-test score than the pre-test score after the students have been exposed to the educational camp.

Learning Objectives

- Identify and justify why this study is a paired study design.
- Understand how to write out null and alternative hypotheses for a paired study design.
- Communicate what different types of errors could be in the context of the study.
- Identify what error we could make based on the conclusion of the authors.

Case Study Article A link to the full article can be found here: https://www.sciencedirect.com/science/article/pii/S2212567115011740

Questions

- What are the observational units for this study?

- What is the sample size? Use proper notation.

- Why is this type of study classified as a paired study design? Be specific.

- How many tests are the authors' testing in this study? Choose one and write out the null and alternative hypothesis in proper notation. /vspace{25mm}
- In Table 7, interpret the value 33.45 in the context of the problem.
- Are the authors' conducting a one tailed or two tailed test? Justify your answer.
- Summarize the authors' conclusions in 2-3 sentences below.
- Define what a Type 1 error would be in the context of the first test (Ch.1).
- Define what a Type 2 error would be in the context of the first test (Ch.1).
- For the first test (Ch.1), what type of error could we make? Justify your answer.
- Would you recommend the Mathematics Excellence Camp to another student? Justify your answer with both **statistical and practical evidence**. Evidence may include conclusions from p-values, point estimates, etc. Post your response on the discussion post "Paired Design Study" on D2L.
- Reflect on the learning objectives above. Post any questions or comments on the "Paired Design - Learning Outcomes" discussion post.