Assignment: Understanding a Controlled Experiment

The didactic objective of this assignment:

- To allow the student to identify the concepts learned related to Controlled Experiments in the subject of Experimental Software Engineering. This assignment focuses mainly on the concepts presented in Chapters 6, 7, 8, 9, and 10 of the book Experimentation in Software Engineering (Wohlin et al., 2012).

General Instructions:

- **For Graduate Students:**
  - **Individual assignment, with analysis of an article in English;**
  - **Any copying between graduate students' assignments will result in a zero grade for all students involved. The assignment must be done individually (all graduate students are expected to be ethical in their assignment!).**

- **For Undergraduate Students:**
  - **Team assignments for 3 to 6 students, analyzing an article in English or Portuguese**.
    - Each team must send an e-mail to the teacher and TAs (with all team members in a copy), confirming the team members by **05/06 at 23:45**.
    - In this e-mail, the team must present which article they intend to analyze.
  - Undergraduate students who want to do the assignment individually do not need to send an e-mail with the article to be analyzed.

- **Choice of articles:**
  - Each graduate student or team of undergraduate students must choose one of the articles available in a folder of the respective topic on the platform.
  - **Graduate students must decide an article in English**.
    - Two articles in the folder can only be decided by undergraduates (as a team or individually).
  - In case the graduate student or team wishes to analyze a different article from those provided, they should email the professor and the teaching assistants, specifying the article they would like to analyze and attaching the article. This email should contain the following information:
    - Whether the article provides the "raw data" (in the article or in a technical report),
      making it possible to reproduce the statistical tests;
    - What statistical tests are carried out.
    - Deadline for sending an e-mail with an article other than those provided: **05/06 at 23:45**.

Assignment items:

- Prepare a **presentation** containing:
  - Your own summary of the article read, presenting the main ideas of the article
    - You don't want to copy the abstract of the article.
  - Possible Objective (Scoping) for the study carried out in the article (describe the objective according to the GQM standard suggested in Chap. 7)
    - If the article presents more than one study, each study may have a different objective.
  - Possible study planning (if not described directly in the article, please include your analysis), containing the following items:
    - Null and alternative hypothesis(es).
    - Independent and dependent variables.
    - Participants (subjects) and contexts.
    - Experimental Design adopted.

  - Regarding data analysis:
    - Present descriptive statistics - mean, standard deviation, boxplots - for each dependent variable (of each study).

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        - Present statistical tests and their results.
            - Perform the normality test for the samples (even if the article's author has not done so).
            - Save screens showing the step-by-step of each statistical test performed.
            - Present and discuss the results obtained.
        - Compare the results with those of the selected article.
    - Reflection on learning:
        - What each student has learned from doing this assignment.
        - If they wish, students can also present what they would do differently if they were to carry out a similar study.
    - Sources and materials consulted:
        - List all materials consulted for the assignment (including tutorials, YouTube videos, etc.), with the date of consultation and the link or full reference to the material;
        - If you had any questions with one of the TAs and/or other students, list the questions and who answered them (also list the question and the date).
    - For teamwork: Minutes showing who did what and when.

Important comments:

- The student (or team) can choose any tool to carry out the statistical analysis (SPSS, R, JASP-Stats, Sigmaplot, among others). But the student must clarify in their presentation which tool they have chosen.
- TAs are available for questions. However, the TAs can ****NOT**** do the assignment for the student! Each student should look for tutorials, books, and websites on how to perform the statistical tests. Doubts raised with the tutors must be specific and must be sent to the TAs by: **09/06** .
- Remember: **be ethical!**

Deadline:

- Deadline for submitting the file to the platform:**11/06 until 23:45 (after that, the platform will not allow file submissions)**.
- Assignments submitted after the deadline will not be accepted – the **team or graduate student** will **receive a zero mark.**

Delivery via the platform - only one member per team should deliver.

- File on the platform - named: Fulano_asgmt2_ESE* (*Fulano = student's name) or Beltrano_Fulano_Sicrano_asgmt2_ESE (with the names of the team members)
- If the platform is down, the team can send an e-mail to the teacher and TAs with the assignment attached, respecting the deadline. Only one team member needs to send the email, but they must copy all team members on the email.