

Exercise Sheet 4: Research Design

Considering the empirical evaluation assigned to your team,

1. Identify the study execution and analysis by answering the following checklist. For each answer, you must provide the section, page, and paragraph numbers in which you have found the corresponding information.

Item	Question	Hints
Execution		
Preparation	<ul style="list-style-type: none"> - What has been done to revise the experimental design before its execution? Why? - What has been done to prepare the execution of the experiment (i.e., schedule, training)? Why? 	
Execution and Deviations	<ul style="list-style-type: none"> - When and how was the experiment performed? - Was the study performed according to the experimental plan? What deviations were reported? 	
Analysis and Discussion of Results		
Data Set Preparation	<ul style="list-style-type: none"> - What has been done to prepare the data set, why, and how? 	
Descriptive Statistics	<ul style="list-style-type: none"> - What are the results from descriptive statistics (e.g., sample characteristics)? 	Summarize the most important descriptive statistics
Hypothesis Testing	<ul style="list-style-type: none"> - What are the results of hypotheses testing? 	
Evaluation of Results and Implications	<ul style="list-style-type: none"> - What are the main results/conclusions of the study? - How do these results relate to earlier research, especially those mentioned in the <i>Background (or the Related work)</i> section? - What inferences can be drawn from the data to general conditions? 	
Threats to Validity	<ul style="list-style-type: none"> - How was the validity of the experimental results assured? - What threats to validity are identified and discussed? - What is their impact in the validity of the results? 	Identify internal, external, construct, and conclusion threats to validity.
Conclusions and Future Work		
Impact	<ul style="list-style-type: none"> - What are technology impacts on the costs, schedule, and quality? Under which circumstances are these benefits (not) expected? 	
Future Work	<ul style="list-style-type: none"> - What other experiments are proposed to further investigate the results yielded or evolve the body of knowledge? 	

2. Critically discuss the current study execution and analysis focusing on the:
 - a. Conformance of the study execution to the plan
 - b. Completeness, traceability, and correctness of the data analysis and interpretations
 - c. Completeness and correctness of the discussion regarding threats to validity
 - d. Relevance of this research from the perspective of software researchers and practitioners
3. Considering the empirical evaluation assigned to your team and the results of previous exercise sheets, propose an alternative research design that solved the identified problems.

Hint: Each team should submit their solutions to Silverio.Martinez [a] iese.fraunhofer.de **until June 29th**. Solutions should be submitted using **PowerPoint** format for facilitating the discussion during the exercise class.
