



DCGI

DEPARTMENT OF COMPUTER GRAPHICS AND INTERACTION
CZECH TECHNICAL UNIVERSITY IN PRAGUE



EMPIRICAL HCI STUDY

EXPERIMENT EXECUTION, POWER ANALYSIS

SAN 2019/20

EMPIRICAL HCI STUDY

- Goal of the study is to test the performance of the newly design keyboard for text writing
- 1. Define research questions
- 2. Define experiment variables
- 3. Describe participants and recruitment procedure
- 4. Define procedure and tasks
- 5. Conduct experiment and measure data
- 6. Evaluate the data measured and draw conclusions

CONDUCT THE EXPERIMENT

- Read the instructions
- Prepare the experiment setup
- Conduct the experiment
- Store measured values into a shared table:

<https://bit.ly/2RAA6oW>

Method "A"

Q	F	U	M	C	K	Z
space		O	T	H	space	
B	S	R	E	A	W	X
space		I	N	D	space	
J	P	V	G	L	Y	

Method "B"

Q	W	E	R	T	Y	U	I	O	P
A	S	D	F	G	H	J	K	L	
Z	X	C	V	B	N	M			
space									

DETAIL INSTRUCTIONS

- Research questions (+ null hypothesis)
 - you can define more than one research questions
- Independent and dependent variables
 - think also of other variables than those needed for measuring speed (NOTICE: A relevant research question must be defined for them)
 - what can be the other variables (control, random, confound)
 - how the values will be measured
- Participants
 - what population does it (should it) represent
 - what should you be aware of during recruitment
- Counterbalancing (within vs. between subject setup)
- Procedure and tasks
- Classification of the experiment validity

DETAIL INSTRUCTIONS

- Statistical analysis of data reporting
 - H_0/H_1 rejection/acceptance
 - group effect, asymmetric learning effect
 - learning curve across trials
 - compare learning curve of method A and B
 - how to determine number of trials when the method A will become faster than method B
- Power analysis of the experiment setup
 - compute and discuss optimal parameters (power, effect size, α , n) for such study
- Parameters of discovery experiment
 - n , X % chance of discovering problems affecting Y % of users

THANK YOU FOR ATTENTION



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