

Test 3 Design and Evaluation of HCI

Module: Intelligent Interaction Design

Bachelor 2 BIT/TCS/CreaTe (EWI)

Module code: 201600105 (BIT/TCS), 201600106 (CreaTe)

Date: January 17, 2017

Time: 8:45-9:45 hr

Module-coordinator: dr. M. Theune

Instructor: dr. ir. D. Reidsma

Type of test: Closed book

Allowed aids during the test: Nothing

Attachments: Multiple Choice form

The test consists of two parts:

- 9 multiple-choice questions. Each multiple-choice question has one correct answer. All students have to answer all of the multiple-choice questions.
- 3 open questions. Answers can be given in Dutch or English.
NB CreaTe students do not have to answer the last open question. Other students have to answer all of the open questions.

All questions have equal weight. The two parts are separately scored. The overall score is the weighed (according to the number of questions) average of both scores.

For the multiple choice part a standard correction for guessing is applied. For the general case of n questions and p correct answers the formula for the score of the multiple choice part is:

$$\max(10 \cdot (p - 0.25 \cdot n) / (n - 0.25 \cdot n), 0)$$

Before leaving the room you must hand in

- the answer form for the multiple-choice questions (we need this for automatic answer analysis)
- the answers for the open questions.

Each page must clearly state your name and student number.

Multiple-choice questions

1. Consider the following three research goals.

- (i) Determine causal relations between multiple factors.
- (ii) Discover connections between multiple events or variables.
- (iii) Identify interesting phenomena or events for future research directions.

Which research methods are typically used for each goal? You can choose from controlled experiment, observation, focus group, interview and survey.

- (a) (i) controlled experiment (ii) survey (iii) observation.
- (b) (i) focus group (ii) observation (iii) interview.
- (c) (i) observation (ii) survey (iii) controlled experiment.
- (d) (i) survey (ii) interview (iii) focus group.

2. What is a null hypothesis?

- (a) An assumption that there is a difference between the conditions in an experiment.
- (b) A baseline that the researcher wants to compare the experimental results to.
- (c) A precise statement that the researcher wants to prove wrong in an experiment.
- (d) A theory that the researcher wants to test in a sequence of experimental studies.

3. What is an independent variable in experimental research?

- (a) A variable that is commonly investigated in all research fields.
- (b) A variable that is controlled by the researchers in an experiment.
- (c) A variable that is independent from the experimental condition.
- (d) A variable that measures what the researchers are interested in.

4. Researchers test a new e-mail system for elderly people by asking a group of men and women between 70-80 years to send five e-mails with the system. All participants use the same version of the system, and the text and addressee of the e-mails is the same for all participants. The researchers only measure the average time it takes the participants to send the e-mails. Which type of experiment is this?

- (a) A factorial experiment.
- (b) A non-experiment.
- (c) A quasi-experiment.
- (d) A true experiment.

5. Which of the following statements about between-group design is **false**?

- (a) Between-group design allows researchers to avoid learning effects.
- (b) Between-group design is also called between-subject design.
- (c) In between-group design each participant is exposed to multiple experiment conditions.
- (d) In between-group design the number of groups directly corresponds to the number of experiment conditions.

6. Suppose you are examining the impact of gender on users' preferences towards two types of operating systems on smart phones: iOS and Android. You recruit two groups of 20 users without experience with any of the operating systems. One group consists of females and the other consists of males. After completing a series of tasks using both operating systems, participants have to answer one question with two possible answers: Which operating system do you prefer, iOS or Android?

Which test is most appropriate to analyse whether there is a relationship between gender and preference for operating systems?

- (a) Chi-square test.
- (b) F test (ANOVA test).
- (c) Pearson's test.
- (d) T test.

7. Which of the following statements about regression analysis is **false**?

- (a) Regression analysis is a nonparametric test method.
- (b) Relationships between variables can be measured by R square values.
- (c) With regression analysis you can investigate the relationship among one dependent variable and several independent variables.
- (d) With regression analysis you can predict the value of a dependent variable.

8. Given are two statements about the number of required participants in controlled experiments.

- (i) The number of participants typically increases as the number of independent variables increases.
- (ii) Within-subjects experiments typically require more participants than between-subjects experiments.

Are these statements true?

- (a) Both statements (i) and (ii) are true.
- (b) Only statement (i) is true.
- (c) Only statement (ii) is true.
- (d) Both statements (i) and (ii) are false.

9. Given are two statements about the use of deception in HCI research.
- (i) Milgram's experiment is an example of the use of deception in research.
 - (ii) It is allowed to use deception in HCI research, but only carefully and sparingly.

Are these statements true?

- (a) Both statements (i) and (ii) are true.
- (b) Only statement (i) is true.
- (c) Only statement (ii) is true.
- (d) Both statements (i) and (ii) are false.

Open questions

1. Give two measures of the central tendency of a set of data.
2. Given is the following statement about the procedure of a heuristic evaluation:
 - (i) Typically each evaluator goes through an interface independently; afterwards the evaluators talk together about what they found.

Is this statement correct? Explain your answer.

3. **NB This question is only for BIT and TCS students.**

Suppose that an interface is evaluated with the 10 heuristics of Nielsen. One of the findings is that the undo button is missing. To which heuristic does this finding refer? Explain your answer.