INTUX PROJECT

Knowledge assessment methodology

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1 Introduction

The knowledge assessment methodology was developed to:

- provide a tool to gage the level of understanding of the participants and to assess the knowledge gained by the students during the course and to decide whether they should pass the course;
- provide a tool to assess the students' preliminary knowledge, in order to adjust the delivery of the course, if necessary or in case it would ensure a more efficient training;
- test the training modules in the pilot phase.

2 Methodology

The knowledge assessment consists of the three elements below.

- Preliminary test: before or at the beginning the course
- Concluding test: at the end of the course
- Practical assignment: to be completed and submitted after the course

2.1 Preliminary test

The preliminary test:

- is conducted before or at the beginning of the course, by each student individually;
- aims to classify students, depending on their knowledge on topics related to the course;
- provides information about whether the training content should be adjusted, and whether any students need additional knowledge.

The test is conducted in the form of a questionnaire, with 8 questions and 3 set answer options for each. The questions are not necessarily related directly to the content of the training material in the 5 Modules, as the aim is to get an overall picture of the preliminary knowledge of the students, including their general knowledge of usability, user testing and accessibility.

The test can be implemented in any format that ensures easy evaluation of the results. In the Pilots, *Wooclap* and *Moodle* platforms were used, allowing for flexibility for the device used.

It is important to explain to the students before the preliminary test that it does not influence, in any way, the final evaluation of their participation in the course.

Preliminary tests are evaluated in order to measure the increase in the level of knowledge, by comparing the grades of the concluding test with the preliminary test results.

For the questionnaire used in the Pilots and its evaluation, see Section 3.

2.2   Concluding test

The concluding test

- is conducted at the end of the course, by each student individually;
- aims to assess the theoretical knowledge of the students about inclusive user testing, after participating in the course;
- aims to determine whether the student has obtained the necessary knowledge to pass the course.

The test is conducted in the form of a questionnaire, with 10 questions and 3 set answer options for each. The content of each module is addressed by 2 questions. (See Section 4, below.)

The test can be implemented in any format that ensures easy evaluation of the results. In the Pilots, *Wooclap* and *Moodle* platforms were used, allowing for flexibility for the device used.

The concluding test is the theoretical part of the course exam, and to calculate a final grade, its results need to be considered together with the practical assignment.

For the questionnaire used in the Pilots and its evaluation, see Section 4.

2.3   Practical assignment

The practical assignment

- is announced at the end of the course;
- needs to be done within 2 weeks (as a suggestion), in written or oral form, individually or in small groups;
- aims to assess the practical knowledge of the students about user testing, after participating in the course;
- aims to determine whether the student has obtained the necessary knowledge to pass the course.

The practical assignment can be conducted in different forms: it can be a scenario, case study, simulation exercise, etc. The Pilots used a scenario exercise.

There is also flexibility in the execution of the exercises: in the Pilots the practical assignments were either individual exercises, to be submitted within 13 days, or small group exercises (maximum 4 students), to be submitted within 3 days. The format required was either PowerPoint or PDF.

Section 5 presents in detail the practical assignment used in the Pilots, as well as its evaluation rubric.

3 Questionnaire for the preliminary test

Questions and answer options (the correct answers are marked in bold and labelled as "correct answer")

1. The usability of a system depends mainly on:

   a. The appropriate usage of icons, attractive colours, and adequate fonts.

   b. The number of features offered. The more features, the higher the usability level.

   c. **The extent to which specific users can use a product to achieve specified goals in a concrete context of use with effectiveness, efficiency, and satisfaction. (correct answer)**

2. Usability can be decomposed into several attributes. Please choose which of the following options is **NOT** related to usability:

   a. Learnability.

   b. **Scalability. (correct answer)**

   c. Safety.

3. With respect to the different channels that can be used to transmit information to the user, which sentence is true?

   a. **The interaction design should ensure that information is transmitted through several alternative channels. (correct answer)**

   b. In the early design effort, you don't need to consider the users with functional.

   c. The election of the information transmission channels depends on the physical user abilities.

4. User-Centred Design means that:

   a. **Users are considered at the centre of every design decision. (correct answer)**

   b. When it is necessary to take a design decision, you directly ask the users, so they design the system.

   c. Users should vote for their preferred design when using a system for the first time.

5. Which is the main result obtained from user testing of interactive systems?

   a. The number of tasks that the test participants complete successfully.

   b. Information about colours and font sizes more adequate for the design of the final system.

   c. **A list of usability problems showing the mismatch between the user mental model and the design. (correct answer)**

6. Can a blind person use any modern smartphone?

   a. Yes. (correct answer)

   b. No, only Android phones are accessible to blind persons.

   c. No, there are no smartphones that blind persons can use.

7. How can persons with attention deficit disorder adapt web pages to read them better?

   a. They do not need adaptation. They can read any page.

   b. They use the browser "reading mode" to disable movement. (correct answer)

   c. They modify the colour settings of the browser.

8. What could be an alternative to a keyboard for persons with physical disabilities?

   a. Speech input. (correct answer)

   b. Braille keyboard.

   c. A gamepad.

3.1 Evaluation

To measure the increase in the level of knowledge, the grades of the concluding test can be compared with the preliminary test results. For such comparison, each correct answer to the preliminary test is worth 1.25 points, meanwhile incorrect answers result in a 1.25 points deduction. A student can achieve a maximum of 10 points.

4 Questionnaire for the concluding test

Questions and answer options (the correct answers are marked in bold and labelled as "correct answer")

1. What is important to think about when it comes to inclusive user testing? (Module 1)

   a. That we need to have an accessible environment for testing. (correct answer)

   b. That we need to include users.

   c. There are not relevant differences when performing an inclusive user testing versus general user testing.

2. What barriers do you need to look out for when it comes to accessible facilities? (Module 1)

   a. Physical barriers (like stairs).

   b. Digital barriers, as digital interfaces and tools being designed and coded so that people with disabilities can use them.

   c. Physical barriers like stairs, and digital barriers, as digital interfaces and tools being designed and coded so that people with disabilities can use them. (correct answer)

3. What is important to think about when recruiting users with disabilities? (Module 2)

   a. **That we need to create all material to be accessible, including test instructions and consent forms. (correct answer)**

   b. There are not specific considerations when recruiting users with disabilities.

   c. That we do not need extra time for recruiting as requirements are more specific than for instance persons from 20 to 50 years.

4. What is the most effective way of recruiting users with disabilities? (Module 2)

   a. Through general social media.

   b. **Through organizations for specific disabilities or conditions, or cross-disabilities organisations. (correct answer)**

   c. Placing an advert in the metro / underground.

5. What is important to think about when it comes to offering support and guidance to people with disabilities? (Module 3)

   a. When the participants are accompanied by a caretaker, or an aide make sure that the caretaker abandons the testing location before starting.

   b. **Make sure directions provide stepwise directions to the testing location and the route is accessible; do not rely only on graphical maps as these may not be accessible. (correct answer)**

   c. If participants bring guide dogs treat them as pets and leave them outside the testing location.

6. What do you need to think about when it comes to inclusive test material? What alternative formats could you offer? (Module 3)

   a. **Provide instructions in multiple modalities, for example, both written and verbal. (correct answer)**

   b. Participants with disabilities are used to understand by themselves all formats of materials, so there is no need to offer alternative formats.

   c. It is enough to provide printed written materials.

7. What is assistive technology? (Module 4)

   a. An assistive technology is a software tool that enhance learning, working, and daily living for persons with disabilities.

   b. An assistive technology is a hardware device that enhances learning, working, and daily living for persons with disabilities.

   c. **An assistive technology is any product, equipment, or system that enhances learning, working, and daily living for persons with disabilities. (correct answer)**

8. What is important to think about when it comes to offering support and guidance before and during a test for persons using an assistive technology (AT)? (Module 4)

   a. Provide the participants a concrete AT so all tests are later comparable.

   b. Allow the participants to use their own personal AT. (correct answer)

   c. Provide support and guidance in relation to different forms of AT.

9. What do you need to think about when it comes to guidance and support after a test session has finished? (Module 5)

   a. Make sure the participant packs up any assistive technology they've brought. (correct answer)

   b. Thank them and ask them to book a taxi or arrange for someone to meet them.

   c. Do not give the participant any feedback to avoid they can talk to the next participant.

10. Why is it important to give users feedback? (Module 5)

    a. To thank them for their participation.

    b. To understand them better.

    c. To make them aware of how relevant their participation was, and to check if our conclusions are valid. (correct answer)

4.1 Test grading

Each correct answer to the concluding test is worth 1 point, incorrect answers result in a 1 point deduction. A student can achieve maximum 10 points.

The formula to calculate an indicator comparing the results of the preliminary test and the concluding test ("relative knowledge gain"):

(points for the concluding test – points for the preliminary test) / points for the preliminary test

The knowledge gain index always needs to be considered together with the baseline result of the preliminary test, since a higher baseline level allows for a lower knowledge gain.

The formula to calculate the baseline:

points for the preliminary test / 10

Example calculation:
- Result of the preliminary test: 5 points.
- Result of the concluding test: 8 points.
- Relative knowledge gain index: (8 – 5) / 5 = 60%
- Baseline: 5 / 10 = 50%

To calculate the final course grade, the points obtained in the concluding test need to be summed with the points obtained in the practical assignment.

5 Practical assignment

The students participating in the course received the following exercise:

You oversee the planning of the usability testing of a mobile application prototype, which must be accessible. So, you must include persons with disabilities in the usability testing sessions.

First, you must identify **potential challenges or barriers** that may arise during user testing when you involve participants with disabilities. Identify at least two challenges that might happen before the test, three during the test, and one after the test. For each of the challenges, provide:

- A short title for the challenge.
- An explanation, why it is a challenge.
- At least one external source of additional information related to the challenge.

Then, **develop strategies** to overcome at least two of the previously identified challenges. For each strategy, provide:

- The short title for the challenge.
- A description of the strategy to overcome the challenge.
- At least one external source of additional information related to the proposed strategy.

5.1 Rubric based grading of the practical assignment

Table 1. Points achievable in the practical assignment

Evaluation category	Level 1: Lacking	Level 2: Emerging	Level 3: Good	Level 4: Excellent
1. Number of challenges	There is no information about challenges. **0 points**	There are less than two challenges for before the test, three during, and one after. **1 point**	There are at least 5 challenges in total, but not the required number in before, during or after the test. **2 points**	There are at least two challenges that might happen before the test, three during the test, and one after the test. **3 points**

Evaluation category	Level 1: Lacking	Level 2: Emerging	Level 3: Good	Level 4: Excellent
2. Description of challenges	The challenges are not described. **0 points**	The descriptions of the challenges are incomplete or incorrect. **1 point**	There are minor mistakes in the descriptions of the challenges. **5 points**	The descriptions of the challenges are correct. **6 points**
3. Sources for challenges	There are no sources for the challenges. **0 points**	Not all challenges have appropriate sources. **1 point**	All challenges have appropriate sources. **3 points**	[No level 4.]
4. Number of strategies	There is no information about strategies. **0 points**	There are less than two strategies. **1 point**	There are at least two strategies. **3 points**	[No level 4.]
5. Description of strategies	The strategies are not described. **0 points**	The descriptions of the strategies are incomplete or incorrect. **1 point**	There are minor mistakes in the descriptions of the strategies. **5 points**	The descriptions of the strategies are correct. **6 points**
6. Sources for strategies	There are no sources for the challenges. **0 points**	Not all challenges have appropriate sources. **1 point**	All challenges have appropriate sources. **3 points**	[No level 4.]
7. Formal aspects	There are important formatting, writing and orthography issues. **-3 points**	There are minor formatting, writing and orthography issues. **-1 point**	Formatting, writing, and orthography are correct. **0 points**	[No level 4.]

5.2 Course grading

Maximum available points:

- Concluding test: 10 points
- Practical assignment: 24 points
- Total: 34 points

The formula to calculate the final course grade:

(points for the concluding test + points for the practical assignment) / 34 × 100

To calculate the final course grade, the results of the concluding test should be added to the results of the practical assignment.

Example calculation:

- Result of the concluding test: 8 points
- Result of the practical assignment: 20 points
- Grade: (8 + 20) / 34 = 82%