



INTUX SUMMARY OF USER SCENARIO TEST RESULTS OR LESSONS LEARNED

This deliverable has been produced as part of the Erasmus + Key Action 2 Erasmus+ Cooperation Partnership project: "INtroducing training on user Testing with people with disabilities into UX design and related higher education Programmes" / INTUX

Project partners:



















The project number: 2022-1-LV01-KA220-HED-000087964

Date of publication: August 2024 Publication license: CC-BY-NC



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1 Introduction

The present document describes the final result of work package 4 of the INTUX project: the refinement of case-based user scenarios, that can be used to organise usability testing sessions directly involving people with disabilities. This refinement is based on the results of practical user testing sessions that were organised by the three universities of consortium.

Section 2 briefly summarises the original user scenarios, that were described in the report for activity 1 of work package 4. These user scenarios consist of a description of how to perform practical sessions of user testing, as well as the prototypes that can be used in the sessions.

Section 3 provides information about the three user testing sessions that were performed at The University of Maribor (Slovenia), Turiba University (Latvia) and the Universidad Politécnica de Madrid (Spain). These sessions involved students (acting as usability evaluators), and persons with disabilities (acting as users).

Section 4 will explain that changes made to the user scenarios, based on the results of the three testing sessions and the feedback received by the participants.

2 Summary of the user scenarios

2.1 Applying the user scenarios - practical session

The practical sessions are intended for students to apply their knowledge on inclusive user testing and make use of several of the best practices identified in the INTUX project. These practical sessions must involve persons with disabilities acting as users.

The proposed organization of the session is:

- Professors will coordinate the session and recruit the participants with disabilities.
 They are also responsible for preparing the prototypes to be used and the space where the test session will happen.
- Professors will organize with the students the tasks that they must do before, during, and after the test.
- 3. Students will prepare the session, by gathering information on the needs of the participants and adapting the session materials to these needs.
- 4. Students will welcome the participants, gather consent forms, perform the usability testing, gather the input from the participants and support them to leave the session.
- 5. Finally, students will prepare a summary of the findings, and send them to the test participants as feedback. See section 2.3.

Details on these steps are provided in the INTUX project" User scenarios" report (project activity 1 of work package 4). The main ideas to consider are summarised below:

- It is essential to gather information about the needs of the participants in the testing session, regarding access to the session space, and use of computing devices. To that end, students should prepare a questionnaire to be sent to the participants to collect that information.
- The collected information will then be used by the students to prepare the session under the supervision of the professors: physical accessibility to the testing room, indications to reach the room, adaptation of documentation to be used in the session.

- The professors should organise the test session, and students should have an active role in this task.
- During the testing session, the students will become the evaluators in the testing session, performing one of the two roles: facilitator (person that speaks directly with the test participant) or note-taker (persons responsible for taking nots of what happens).
- At the end of the session, students should participate in compensation activities (giving presents to participants, for example) and should help participants getting out of the testing room.
- When the test session has finished, students should prepare a short report with the
 main findings of the testing session with respect to the prototype(s) used. This report
 is to be sent to the test participants as feedback about how valuable their help was
 during the usability testing session.

2.2 The scenarios

The work on activity 1 of work package 4 included the development of 4 scenarios. Each scenario consists of a prototype of an interactive website, and a definition of usability testing tasks. These scenarios are to be used in the practical sessions of usability testing and are described in detail in the report of activity 1 of work package 4.

Table 1 summarises the main information about the testing scenarios.

Table 1. The INTUX project testing scenarios.

Scenario name	Topic area	Summary of tasks
1. Supermarket	Website of a new online supermarket (INTUX shop) that offers various food products, which are classified into different categories: drinks, frozen food, fresh food, ready meals, special offers and others. It has special consideration for food-related allergies.	 See how much the cheapest frozen ships cost. See the total price for 5 litres of lactose-free milk and 1 Kg of apples. Make a purchase of more than 50 euros. Buy products for making stir-fried noodles.
2. MentorIA	Prototype of a solution to support the study and training for students with learning difficulties. This technological solution also helps organize their daily activities and improve their learning and studying methods.	 Check a task. Check upcoming tasks and set an alarm.

Scenario name	Topic area	Summary of tasks
3. Traveller	The Traveller is a hotel search and booking application designed to assist users in finding and reserving accommodations for their trips. Users can search for hotels in various locations, specifying their preferred dates and the number of guests (including adults and children).	 Registration of a new user. Login to the system. Search of all available accommodations for a specific period. Selection and confirmation of an accommodation. Cancel the accommodation and logout.
4. Event Planner	Create your own Event Planner event that can be scheduled from a project management perspective. The website offers standard sign-in, sign-out, and registration features, and supports both English languages.	 Registration of a new user. Create a new event. Editing an event. Removing an event. Recreated new Event and log-out.

3 The testing sessions

3.1 University of Maribor (Slovenia)

3.1.1 Details of the session

The session was held on March 5th, 2024 at the University of Maribor, Faculty of Electrical Engineering and Computer Science.

Participants:

- 4 students, conducting the usability evaluation tests, both as facilitators and observers.
- 7 persons with disabilities, acting as users.
- 1 member of DPO as observer of the session
- 4 professors at the University of Maribor, as workshop organisers

Scenarios used:

Traveller

3.1.2 Feedback from students

Table 2 summarises the replies to the quality closed questions asked after the testing session. All students thought that the workshop was useful, and they were satisfied with the workshop. Most students provided positive views on increase of interest and acquisition of skills. And two questions had several negative replies: importance for professional activity in the future and increase on understanding of accessibility needs.

Table 2. Replies to quality questions - students - Slovenia

Question	1 Totally disagre e	2	3	4	5 Totally agree
The workshop was useful for putting into practice what I learned about inclusive usability testing	0	0	0	0	4
The workshop increased my interest in inclusive usability testing.	0	0	2	1	1
The workshop contributed to the acquisition of skills that I will be able to use when performing inclusive usability testing	0	0	1	1	2
The practical knowledge gained at this workshop will be important for my professional activity.	0	2	1	1	0
Experience with users with special needs allowed me to understand their accessibility needs.	0	1	0	0	3
In general, I am satisfied with the development of the practical workshop.	0	0	0	0	4

• What did you like most about the workshop?

- Socializing, conversation
- Working with people with special needs
- o Communicativeness of the participants
- Contact with people with disabilities and insight into their way of perceiving applications.

• What did you like least about the workshop?

- That it was an afternoon session.
- Do you have any suggestions for improving the workshop?
 - More conversation with people with disabilities to learn about their problems and suggestions for improvements.
 - Provision of appropriate equipment for all participants, and multiple copies of instructions to facilitate recording of observations.

3.1.3 Feedback from persons with disabilities

Table 3 summarises the replies to the quality closed questions asked after the testing session. All participants gave positive feedback to the usefulness of the workshop, increase of interest and general satisfaction. The only question with two negative answers was the perceived increase of confidence to participate as a user in usability testing projects.

Table 3. Replies to quality questions – persons with disabilities - Slovenia

Question	1 Totally disagre e	2	3	4	5 Totally agree
The workshop was useful for putting into practice what I learned about inclusive usability testing	0	0	0	4	3
The hands-on workshop increased my interest in participating in usability testing in the future as a user	0	0	0	3	4
The hands-on workshop increased my confidence to be able to participate as a user in any usability testing project	0	2	0	3	2
In general, I am satisfied with the development of the practical workshop	0	0	0	3	4

- What did you like most about the workshop?
 - o Testing.
 - o Friendly approach of lecturers.
 - o Practical part.
 - o Practical products of students.
 - o Dynamics, friendly environment.
 - o Practical experience.
 - o Interaction with users.
- What did you like least about the workshop?
 - o **Theoretical** content.
 - o I did not like the session at all.
- Do you have any suggestions for improving the workshop?
 - o More listener involvement during theory.
 - o More physical space for the participants.

3.1.4 Feedback from observers

There was one observer from an organisation of persons with disabilities. Their replies to the closed-ended quality sessions, which were all positive, are shown in Table 4.

Table 4. Replies to quality questions - observers - Slovenia

Question	1 Totally disagre e	2	3	4	5 Totally agree
The practical workshop was useful for the students, as they learned about the needs of people with special needs.	0	0	0	1	0
The hands-on workshop was beneficial for people with disabilities as it increased their confidence to contribute to any usability testing project as users	0	0	0	1	0
The hands-on workshop increased my interest in usability testing as a positive activity for people with special needs.	0	0	0	0	1
In general, I am satisfied with the development of the practical workshop	0	0	0	0	1

- What did you like most about the workshop?
 - Good explanation.
- What did you like least about the workshop?
 - o I have no comment.
- Do you have any suggestions for improving the workshop?
 - o Maybe more time for some kind of workshop.

3.2 Turiba University (Latvia)

3.2.1 Details of the session

The session was held on February 26th, 2024 at the University of Turiba, Information Technology Field room C111.

Participants:

- 6 students, conducting the usability evaluation tests, both as facilitators and observers.
- 6 persons with disabilities, acting as users.
- 3 members of DPO as observers of the session
- 2 professors at the University of Maribor, as workshop organisers

Scenarios used:

• Event Planner

3.2.2 Feedback from students

Table 5 summarises the replies to the quality closed questions asked after the testing session. In general, their replies are positive, with some neutral replies to usefulness (1), increase of interest (1), acquisition of skills (2). The question with more neutral replies (4) was about importance for future professional activity.

Question 2 5 1 3 **Totally Totally** disagre agree е The workshop was useful for putting into practice what I learned about 0 0 1 3 2 inclusive usability testing The workshop increased my interest 0 0 1 4 1 in inclusive usability testing. The workshop contributed to the acquisition of skills that I will be able 0 0 2 2 2 to use when performing inclusive usability testing The practical knowledge gained at 0 0 1 this workshop will be important for 4 1 my professional activity. Experience with users with special needs allowed me to understand 0 0 3 2 1 their accessibility needs. In general, I am satisfied with the development of the practical 0 0 0 2 4

Table 5. Replies to quality questions - students - Latvia

As for the open-ended questions, here is a summary of their replies:

• What did you like most about the workshop?

workshop.

- Working with people with disabilities gave me an insight that people need these kinds of projects to get a better understanding about information technologies.
- Communication with people
- The opportunity to participate in the testing process as a whole.
- o I liked the most the possibility to experience software testing with users
- o A good prototype that can reveal some specific needs that people may have.
- Seeing in practice problems that arise during testing.

• What did you like least about the workshop?

- Small choice of Tea
- everything was fine
- There was a lack of more specific clarity of action, or an instruction for independent action. needed help from the outside to understand what to do
- Didn't find anything that i disliked
- Some confusion clouded progress

Do you have any suggestions for improving the workshop?

- More specific operating instructions were required for independent action, and what to do in a moment of confusion.
- o A prototype that has a little more functionality.

3.2.3 Feedback from persons with disabilities

Table 6 summarises the replies to the quality closed questions asked after the testing session. In general, their replies are positive. Only one participant provided neutral replies to increase confidence and general satisfaction.

Table 6. Replies to quality questions – persons with disabilities - Latvia

Question	1 Totally disagre e	2	3	4	5 Totally agree
The workshop was useful for putting into practice what I learned about inclusive usability testing	0	0	0	3	3
The hands-on workshop increased my interest in participating in usability testing in the future as a user	0	0	0	4	2
The hands-on workshop increased my confidence to be able to participate as a user in any usability testing project	0	0	1	2	3
In general, I am satisfied with the development of the practical workshop	0	0	1	1	4

As for the open-ended questions, here is a summary of their replies:

• What did you like most about the workshop?

- Challenge to get on the page.
- For me very important was the assistance of students who can provide me with the necessary support.
- The opportunity to actually operate the prototype was very interesting
- Interesting tasks and good company.
- Usability testing it myself was great. I did not feel any pressure and judgement hindering my ability to use the product. I have got enough support when I don't understand something.
- Opportunity to participate in the test.

• What did you like least about the workshop?

- o Register with an account
- o It was a little bit too loud around me.
- o I did not like the product, the testing process itself was great.
- o To clarify something more specifically.
- Do you have any suggestions for improving the workshop?

- o It would be easier if you could copy the links instead of writing them by hand
- o More instructions.

3.2.4 Feedback from observers

There were three observers from organisations of persons with disabilities. Their replies to the closed-ended quality sessions are shown in Table 7. One question received one negative feedback (increase of confidence of persons with disabilities), but overall, their opinions are positive.

Table 7. Replies to quality questions - observers - Latvia

Question	1 Totally disagre e	2	3	4	5 Totally agree
The practical workshop was useful for the students, as they learned about the needs of people with special needs.	0	0	1	2	0
The hands-on workshop was beneficial for people with disabilities as it increased their confidence to contribute to any usability testing project as users	1	0	0	2	0
The hands-on workshop increased my interest in usability testing as a positive activity for people with special needs.	0	0	0	1	2
In general, I am satisfied with the development of the practical workshop	0	0	1	0	2

As for the open-ended questions, here is a summary of their replies:

• What did you like most about the workshop?

- Different users had the opportunity to try the prototype and understand how the testing works.
- o I like the possibility to work together for students and people with disabilities
- Opportunity to participate.
- o Everything was organized in a good and accessible way

• What did you like least about the workshop?

- It was difficult for people to register
- Instructions about actions, what and how to do when I could not do the necessary things.
- o I felt confused.

Do you have any suggestions for improving the workshop?

- Put more emphasis on the different needs of people, because people with different needs participated in the testing.
- Everything was organized in a good and accessible way.
- A better instruction on what to do at what moment.

3.3 Universidad Politécnica de Madrid (Spain)

3.3.1 Details of the session

The session was held on April 10th, 2024, at the Computing Engineering School of the Universidad Politécnica de Madrid.

Participants:

- 6 students, conducting the usability evaluation tests, both as facilitators and observers.
- 4 persons with disabilities, acting as users.
- members of DPO as observers of the session
- professors at the University of Maribor, as workshop organisers

Scenarios used:

- Supermarket
- MentorIA

3.3.2 Feedback from students

Table 8 summarises the replies to the quality closed questions asked after the testing session. The replies to all questions were very positive, with the exception of the possibility of applying the practical knowledge gained in their future professional activity.

Table 8. Replies to quality questions - students - Spain

Question	1 Totally disagre e	2	3	4	5 Totally agree
The workshop was useful for putting into practice what I learned about inclusive usability testing				1	5
The workshop increased my interest in inclusive usability testing.			1		5
The workshop contributed to the acquisition of skills that I will be able to use when performing inclusive usability testing				1	5
The practical knowledge gained at this workshop will be important for my professional activity.			3	1	2
Experience with users with special needs allowed me to understand their accessibility needs.				2	5
In general, I am satisfied with the development of the practical workshop.					6

• What did you like most about the workshop?

- I really liked being able to take part in the role of evaluator since I was able to get closer to the users and the opportunity to put into practice the theory that I was learning since the beginning of the master's degree.
- I think it is to see how each person uses the prototypes differently, to be able to practise how they interpret the initial situation and to put into practice what they have seen, finally experiencing their 'mental models'.
- The predisposition of the users, all of them willing to help and with a lot of enthusiasm.
- To be able to apply theoretical knowledge in a real workshop and to learn the difficulties that arise during the workshop itself.
- Interaction with users with disabilities, as I don't have the opportunity to interact with them on a day-to-day basis.
- o Teacher care and teacher preparation.

What did you like least about the workshop?

- I think we could have had a meeting before the workshop to prepare a bit more with the prototypes and to know what the specific objectives are for each different disability.
- Perhaps the 'extensive' documentation, which I understand is more for administrative and bureaucratic reasons, but it is long to fill in so many times.
- It is possible that we were a little less prepared than we should have been to make it perfect.
- For my part, I think everything went well, the organisation was good, and we
 were able to carry out all the tests we had planned. I would have liked to see
 the tests carried out with other prototypes, as we only tested with one of
 them
- The organisation of tasks we could have saturated José Luis with questions.
 Maybe have a task organisation more associated with each person or the way to organise it as many of us evaluators do not know each other, and we have hardly any contact except teams (which many people do not use).

Do you have any suggestions for improving the workshop?

- I really enjoyed the workshop and was delighted. I would have liked to have more throughout my year at UPM to perfect my participation.
- It may be 'adding variability' to people with disabilities, looking for different profiles as I think I have only really experienced two. But I understand that it is not only complicated, but it can be a bit gross to 'ask for different profiles' from the participating organisations. Otherwise, I liked it very much, all the people had a facilitating attitude and were willing to participate. I found it really enriching on a personal level to be able to get closer to these people that we don't usually have in our minds as designers.
- None beyond debugging questionnaires and user tasks.
- The workshop could have been improved if the whole team had been better organised and the particular needs of the participants had been taken into account when developing the materials. Although I did not have previous experience, everything went well.

- I think that only by orienting the users to the prototype, for example with the MentorIA prototype to use users who still use such platforms and can be useful to them.
- Create a timetable of deliverables-day and times of attendance prior to seminar registration rather than setting a date/time afterwards.

3.3.3 Feedback from persons with disabilities

Table 9 summarises the replies to the quality closed questions asked after the testing session. The replies were mostly all positive or very positive, with only one neutral reply to the question about confidence to participate as a user in future usability tests.

Table 9. Replies to quality questions – persons with disabilities - Spain

Question	1 Totally disagre e	2	3	4	5 Totally agree
The workshop was useful for putting into practice what I learned about inclusive usability testing				1	3
The hands-on workshop increased my interest in participating in usability testing in the future as a user				1	3
The hands-on workshop increased my confidence to be able to participate as a user in any usability testing project			1		3
In general, I am satisfied with the development of the practical workshop					4

As for the open-ended questions, here is a summary of their replies:

• What did you like most about the workshop?

- To be able to participate in this project and to be able to participate in many other such projects.
- To be able to provide the organisers with useful knowledge about the tools I work with, and to have discussions with them about their academic and professional activity.
- o It was new and enjoyable.
- The activity of shopping.

What did you like least about the workshop?

- I have nothing against it as I found it very interactive, original and novel to help the brain to use logical deductive thinking and to use the famous but complicated mathematics.
- One problem I find in general when testing usability (as a disabled user), is that
 it is necessary to distinguish between usability and accessibility issues when
 answering the questionnaires. In all cases of the study I have found the
 prototypes to be certainly good in all the usability parameters, but not in the

accessibility ones. They are all very intuitive and efficient to use for a non-disabled user, but in my case the accessibility problems have resulted in both parameters being visibly negatively distorted, and the usability questionnaires do not offer a simple way to disaggregate both circumstances. In my view, this can make further analysis of the data from the results more difficult.

o A bit confusing at the beginning, between the presentation and the first test.

Do you have any suggestions for improving the workshop?

- No, the truth is that I don't have any suggestions, just maybe I have seen a certain level of difficulty when it comes to solving the tasks but I liked it, it was good to practise deductive thinking, logical thinking and help the brain to refresh maths and numeracy, as it is not my strong point, as I am more into letters and humanities, but it is always good to learn new things and do different things in the routine, as well as participating in different projects like this one. Thank you very much for having me in this one. You have been a great support in solving the tasks.
- o To improve the accessibility of the prototypes.
- o Perhaps add a short explanation/example before starting the actual activity.

3.3.4 Feedback from observers

There were two observers from organisations of persons with disabilities. Their replies to the closed-ended quality sessions are shown in Table 10. All the replies to all questions were very positive.

Question	1 Totally disagre e	2	3	4	5 Totally agree
The practical workshop was useful for the students, as they learned about the needs of people with special needs.					2
The hands-on workshop was beneficial for people with disabilities as it increased their confidence to contribute to any usability testing project as users					2
The hands-on workshop increased my interest in usability testing as a positive activity for people with special needs.					2
In general, I am satisfied with the development of the practical workshop					2

Table 10. Replies to quality questions - observers - Spain

As for the open-ended questions, here is a summary of their replies:

• What did you like most about the workshop?

- The fact that the participants were able to test the prototypes was a novelty for me.
- Everything has been very well adapted.
- Good organisation.
- Very correct and normalised treatment of participants with disabilities by university students and organisers.
- What did you like least about the workshop?
 - o Nothing.
- Do you have any suggestions for improving the workshop?
 - Nothing

4 Refinement of the user scenarios

4.1 Analysis of the results of the practical sessions

All the three sessions were successful: students could act as usability evaluators of interactive prototypes, including persons with disabilities as users. Both students, persons with disabilities and representatives of organizations were very satisfied with the sessions.

Students felt that they were well prepared to perform the usability tests, and they also felt that the session allowed them to acquire skills that would be useful to perform inclusive usability tests in the future. On the contrary, several students did not feel that what they learned would be useful in their future professional activities. The suggestions made by the students were focused on practical issues (such as the time of the day) and asking for more possibilities to better prepare for the session. Finally, students were happy to be able to meet with persons with disabilities and to see how they used the prototypes.

The participants with disabilities were happy to apply what they learned in the user empowerment sessions and most of them felt a high interest to be involved in the future in usability testing activities. But some of them did not feel that the session improved their confidence to be able to participate as a user in any usability testing projects. Their suggestions were focused on increasing the accessibility of the place used in the session (both physical access and auditory comfort) and increasing the accessibility of the prototypes. But in general, they were happy about participating in the session and being able to test the usability of interactive prototypes.

The representatives of organisations of persons with disabilities had also positive views on the sessions and how persons with disabilities were involved and treated by the students and the professors. Most of them demonstrated interest in the possibility of persons with disabilities to participate as users in usability testing sessions.

4.2 Lessons learnt

Taking into account both the replies to the closed-ended questions and the replies to the open-ended questions, the following lessons have been learned:

LL1. **Venue accessibility.** Special care needs to be taken with respect to the accessibility of the venue chosen for the usability testing session. Examples of issues to be addressed are physical accessibility (enough space for wheelchair users) and acoustic accessibility (avoid excessive noise).

- LL2. **Prototype accessibility.** It is important to enhance the accessibility of the prototypes, so that the session can be really focused more on discovering usability issues (related to effectiveness, efficiency and satisfaction) than on detecting accessibility problems that will create strong difficulties for the users.
- LL3. **Enhance familiarity of students with prototypes**. Students need to be given enough time to familiarise themselves with the interactive prototypes and the usability testing tasks, before the session happens. They need to have a good understanding of how the prototypes work so they can give good support to the users.
- LL4. **Include demonstrations**. At the beginning of the session, it would be good to perform a short demonstration of how the usability test is to be performed. That way, persons with disabilities will better know what is expected from them.

4.3 Considerations related to the practical sessions

Minor adjustments were made based on the lessons learned. These modifications are summarized below:

- In the description of the general overview of the session, a sentence has been added to emphasize the importance of the prototypes being accessible.
- In the section "before the test", a new paragraph explains that students need to be given time to familiarise themselves with the prototype(s) to be used, and the tasks that the users will perform.
- In the section "during the test", a new paragraph explains that professors should do a demonstration of usability testing at the beginning of the activity.

4.4 Considerations related to the scenarios

There are no changes required on the four scenarios, except to improve their accessibility. In some cases, some of the users with disabilities had difficulties performing the tasks because of accessibility mistakes.

But these accessibility issues are implementation-dependent and do not require modification of the scenarios described in the INTUX project "User scenarios" report (project activity 1 of work package 4).

It is only to be noted that inclusive testing requires that the interactive system to be tested meets accessibility requirements, so that the users with disabilities can focus on usability issues: whether they can perform the tasks without mistakes (effectiveness), with moderate effort (efficiency) and having good feelings about the system being tested (satisfaction).