Usability Test Manual

2021 **Ver. 1.0**

Developed for a Project 'Development of the K-EDU Academy Service based on XR and AI that combines the Korean Wave and establishes Business Centers at New Southern countries'

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How to Use This Manual

The manual includes definition of terms, required personnel and equipments, directions for test operation, data acquisition, basic analysis, and result reporting.

'1. What is Usability Test' (pp. 7), and '2. Elements of Usability Test' (pp. 10) are written to help understand the basic concept of usability test.

We've segmented Planning(pp. 15), Operation (pp. 20), Data analysis(pp. 25) in 10 steps to explain procedure and consideration that guide execution of the actual usability test, also providing necessary document formats in appendix(pp. 29).

A user planning usability test can use (Appendix 1 - Usability Test Chart) for the planning, and implement the test following details from the 10-step procedure.

Definition of Roles

SEQ	Step	Facilitator	Assistant 1	PTP	Client
Planning	Goal Setting	- Request goals and objectives with the client. - Fill out test outline (Appendix 1) - repeat			- Identify a goal - Set specific objectives
	Range Selection	- Request test period and number of participants. - Request tasks to test and evaluation methods. - Book a place(s)	- Check what to prepare for the testing environment (space, product, tasks, etc.).		- Choose tasks. - Choose an evaluation methodology. - Identify the number of participants.
	Evaluation Metrics Establishment	- Choose evaluation metrics. - Choose data to measure. - Establish a data measurement method.			- Check evaluation metrics, data to measure, and its measurement method.
	Analysis Method Selection	- Define a data pre-processing method. - Define a data analysis method.			- Check data analysis methods.
	Participant Recruitment	- Establish participant recruiting criteria. - Choose a participant recruiting method.	- Recruit participants.		
Test Operation	Evaluation Sheet Preparation	- Write a script(protocol, Appendix 6)	- Prepare questionnaire sheets (Appendix 2). - Prepare description sheets (Appendix 3). - Prepare a written consent (Appendix 4). - Prepare data sheets (data.xlsx).		
	Testing Environment	- Check the testing room.	- Place furniture. - Install PC and cameras.		
	Pilot Test	- Look over the checklist (Appendix 5). - Run a pilot session (1 person). - Revise protocol based on feedback.	- Recruit one participant. - Set up PC and smartphone. - Record the session with a cam.	- Evaluate	
	Main Test	- Introduce the experiment. - Request to fill out the questionnaire and consent form. - Operate the test. - Run an interview after the test.	- Contact and guide participants (8 people). - Collect questionnaires and consent forms. - Record video and audio. - Clean up the testing environment.	- Evaluate	- Provide feedback on results.
Data	Data Analysis	- Conduct data analysis (individual/whole). - Conduct data analysis (basic statistics).	- Enter a datasheet using collected data. - Pretreat the data.		
Report	Report Writing	- Write a report (Appendix 6 ,7, & 8).			

Usability Test Process

by S Cube Design Lab

A

Goal Setting

B

Range Selection

C

Evaluation Metrics Establishment

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Participant Recruitment

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Evaluation Sheets Preparation

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Testing Environment Setup

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Pilot Test

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Main Test

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Data Analysis

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Writing a Report

Definitions of Terms

Usability	Degree to which a product or system can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use.
Usability Test	A comprehensive term for different ways in observing a user using a product to perform specific tasks.
Think Aloud	A methodology to express one's thoughts out loud. Practiced by participants while performing target tasks.
Metrics	A system of measurement of the effectiveness, efficiency, and satisfaction of a user working with a product.
Effectiveness	The accuracy and completeness with which specified users can achieve specified goals in particular environments.
Efficiency	The resources expended in relation to the accuracy and completeness of goals achieved.
Task Completion Time	A measure of the time it takes a user to perform a task (from start to finish).
Speed	Time spent by a participant to perform assigned tasks.
Error Rate	A rate of errors that a participant produced while performing assigned tasks for testing.
Satisfaction	Subjective satisfaction of the user's experience that is enjoyable, pleasant, and comfortable to use, judged by how they feel.
Accessibility	Can a user access to software's features? Are they easy to find?
Learnability	A measure of how much time and effort are necessary for a user to perform useful tasks with a system.
Ease of Use	Whether a beginning user can use a product easily and conveniently once reached a certain level.
Visibility	Whether a user can visually understand a product and its status (system, display, etc.) easily and quickly.
Simplicity	Means that all designed elements have clear purpose.

1

What is Usability Test?

i. Introduction to Usability Test

“Usability test examines whether a product's development purpose is appropriately delivered to users.”

Usability	* The degree to which the system is easy to learn and use
Usability Test	* A comprehensive term for different ways in observing a user using a product to perform predefined tasks. * Conducted to obtain a clearer understanding of whether users’ needs are fulfilled.
Purpose of Usability Test	* Helps solving UX/UI design problems. * Reveals unknown design issues.
Ways to Evaluate Ease of Software Use	* Tests the S/W’s user intimacy. * Also called UX testing, as it observes a user’s experience when interacting with the S/W

“In the product development process, it is necessary to recognize the importance of usability tests and reflect the test results to the development.”

Why is Usability Test Important?	* Helps to understand S/W users’ behavior and demands. * Enables to answer a question “did we make the right product?” * Can be applied to product design phase or early development phase. * Recommended to test a software feature that is used repeatedly. * Negative feedback means parts to improve, rather than that the product is failed.
Strenghts of Usability Test	* Saves time for the S/W design process. * Reduces costs for S/W coding and rebuilding. * Enables valuable changes based on data insights. * Affirms that the product will succeed.
Weaknesses of Usability Test	* Data obtained from the test is complicated to analyze. * Only dedicated participants offer appropriate insights. * Participants might disclose information about the product to the public.

ii. Principles & Considerations for Usability Test

"It is possible to configure evaluation items with flexibility based on the type, characteristics, and purpose of the experiment. Also, it is important to establish a test plan in advance."

Choose the Product's Most Important Tasks	* Choosing tasks related to new or trial features aren't the right way to conduct test.
Use Standard Metrics	* Success rate, time of completion, error rate
Do not Disturb the Users	* Do not ask feedback or explanation to participants in test to avoid biased results by distracting them.
Must Use Target Customers	* Enables a comprehensive evaluation of how the user group that is the product's primary consideration uses the product.
Hire Many Participants	* The more participants involved, the more accurate and valuable feedback obtained.

"The facilitator should have an attitude of preparation, non-intervention, and staying neutral to operate usability test effectively."

Factors to Consider while Usability Test	* Any structured and unstructured records can be helpful. * Video recordings can help double-checking specific feedback and insights after the test. * Request "think aloud" to participants: ask them to express their thoughts and feelings verbally while the test * Do not give any direction to participants in test. Make decisions according to their intuition and behavior patterns instead. * Draw a conclusion after all sessions are done rather than in the middle of the test. Participants need time to operate the system. * Observing participants' screens can influence or disturb their task performance. * The facilitator should stay impartial during test. An effort to maintain a neutral voice and body language is also necessary. * Observe participants' verbal cues and body language closely.

II

Elements of Usability Test

iii. Staff and Participants/Space /Equipments

Staff and Participants

Facilitator

General Manager who leads Usability Test

* Presides the operation of usability test. Engages with participants, explains the test, writes consent form, runs the test, explains subjective evaluation, and facilitates the interview.
* Asks questions to participants and tries to gain as much data as possible through the tests.

Assistant Facilitator (Note taker)

Primary Assistant Personnel who Supports Usability Test Operation

* Sets up the rooms, places furniture, installs and tests equipment (PC, camera, S/W operation), prepares manual, written consent, survey, data sheet, and other documents for participants.
* Takes notes on what participants say or do throughout the whole tests.

Participant

A Subject who Participates in a Usability Test.

* Participates in an experiment, suggests ideas for improvement, performs experimental tasks and generates data.

Equipments

Monitor +PC

- Run test
- Write report
- Save data

Laptop

- Save video recording files
- Record "think aloud"

S/W

- Write report

Smart -phone

- Perform tasks (app/video)

Tablet

- Perform tasks (app/video)

Camera

- Video recording

Desk

- Perform tasks
- Fill out questionnaire
- Take a break

Chair

- Perform tasks
- Fill out questionnaire
- Take a break

Snack (Beverage)

- Wait and rest
- Provided to participants

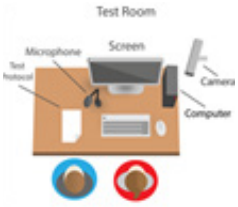
<Image source: flaticon.com>

Space

Control Room

Control Usability Test (Main room)

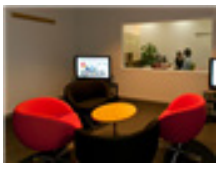
* Facilitator's room, who presides usability test operation and controls the experiment.
* Provide a space in a test room if it's difficult to have a separate area.
* Observe participant’s task performance.



Test Room

Participants Perform Usability Test (Lab)

* Test target devices(smartphone, etc.), cameras, microphone, speakers, and other devices.
* Place furniture and equipment and save data.
* Prepare necessary documents, including description sheets, written consents, and questionnaire sheets.



Waiting Room /Lounge

Explain the Usability Test, Rest and Wait

* Let participants wait before the session.
* Keep consent forms, description sheets, and subjective evaluation data sheets.

<Image source: flaticon.com>

iv. How to Conduct Usability Tests

Guerrilla Usability Test

* Operated in public spaces such as Cafes and stores with randomly selected participants
* Participants perform a quick test and receive rewards.
* The test is quick and low-cost.
* The facilitator should be highly skillful.
* Quick sessions seeking to understand participants' demographical characteristics.

Remote Usability Test (Web, App)

* Mostly ran remotely by a facilitator
* At the same time, it remotely records a user's electronic behavior
* Useful to gain insights from a broad range of users.
* Results can vary depending on a facilitator's skill and ability to control

Screen Share Session

* Gathers feedback from participants performing specific tasks.
* At the same time, it remotely records the user's electronic behavior.
* Costs less as it has a geographically broad scope.
* Useful when obtaining more evaluation metrics in a small amount of time as it costs lower than 1:1 interviews.

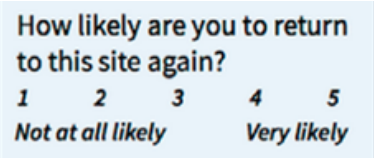
<Image source: flaticon.com>

v. Evaluation Sheet

Questionnaire	* Use [Appendix 2 - questionnaire sheet (for participants)]
Test Description	* Use [Appendix 3 – description sheet]
Consent Form	* Use [Appendix 4 – Consent form]
Checklist	* Use [Appendix 5 - checklist]
Usability Test Script	• * Use [Appendix 6 – Usability test script]
Report	* Use [Appendix 7 – Report]
List of Participants	* Use [Appendix 8 – List of participants]
Report Cover	* Use [Appendix 9 – 1-page test overview]

vi. Evaluation Scales

Quantitative data

Scale Type	Example	Result
Verbal Response	Please describe anything that most confused you using this program.	A user's verbal responses are associated with a specific moment (location) of their service use. Therefore, means to mark response spot is needed.
Multiple Choice	Do you trust this company's product? - Yes -No	Make sure to collect categorized responses. e.g. nominal, dichotomous (yes/no), ordinal (Likert scale)
Rating Scale		Collecting sequential variables is recommended (low-medium-high).
Written Response	If this program is missing something, what would it be?	Useful when implementing post-study. How many people are providing a similar response? Helps quick user story writing.

vii. Metrics

Qualitative Metrics

Evaluation Factors	Efficiency	The efficiency of exhausted resources to achieve the objectives. - Design to which users can complete the task within minimum steps.
	Effectiveness	Whether the system achieves objectives with quality. - Support to enable users to process and restore errors easily and freely.
	Ease of Use	- Can the user use the system conveniently?
	Architecture of Information	- Do the system's structure, layout, and information grouping meet the user's satisfaction?
	Labeling	- Does the system offer precise terms? - Can the user understand terms in the system easily?
	Visual Appearance	- Is the system's web interface design attractive?(Menu and icon's design, colors, position, etc.)
	Error Correction	- Can mistakes be easily, quickly recovered? - Does the system trigger mistakes?
	Learnability	Quality of a product that allows the user to learn how to use an application. - Design to ensure the information's visibility so that users recognize them easily.
	Memorability	Does it maintain a minimum amount of information to achieve a task? Do not suggest items over a certain range of amount to minimize users' cognition overload.

Evaluation Factors	Understandability	Quality of a product that allows understanding specific tasks or conditions. A system should maintain consistency in ways to perform different tasks.
	Feedback	Reactivity of software product about user input or interaction methods. Provides information about a user's current location and control status.
	Guidance	Whether UI provides meaningful feedback about the current situation or error. - Provide useful information and instructions related to use in user manual.
	Flexibility	Ability to allow the user to adjust to tasks besides predefined settings, or change of environment. - Can customize interface adhering to individual user's preference.
	Universaility	Ability to allow the user to adjust to tasks besides predefined settings, or change of environment. - Consider all users with different disability statuses and racial and cultural diversity.
	Stability	Software product's quality to protect information and data. - Protects unauthenticated information, access of different users, and data.

Quantitative Metrics

Evaluation Factors	Task Success	Was a participant able to complete task in a given task scenario
	Time on Task	How much time took the user to complete given tasks? Useful when comparing a product with competitors
	Error Rate	What is the most frequent error made by users? Has two categories: significant and nonsignificant. Significant errors make users fail from completing a task, while nonsignificant errors simply reduce the efficiency of achieving it.

1

Planning

A. Goal Setting

A usability test plan should reflect the demands of stakeholders who participated in the development appropriately.

1 **Planning Evaluation Test** | 2 Participant Recruitment | 3 Evaluation Sheet Preparation | 4 Test Environment Setup

5 Pilot Test | 6 Main Test (Data Collection) | 7 Data Analysis | 8 Writing a Report

Goal Definition	* The test should be planned based on the evaluation objectives. * The goals should suggest a roadmap for running the test. * Answers to the questions below should be determined: - What are we trying to achieve through this test? - What insights do we expect? - What are we trying to suggest to our stakeholders? * Objectives of the research (examples) - Explore new design ideas. - Discover major usability issues. - Evaluate performance targeted to specific users (e.g., hairdressers age of 20s) - Conduct comparative analysis with competitors' products or services. * Fill out a testing outline based on the client's request. (Appendix 1)
Specific Objective Setting	* What usability feedback do we seek? - Validating high-level approach - Identifying important usability issues - Evaluating a new feature just added or a particular corner case - Studying performance by specific users (e.g., expert users familiar with old version) - Comparing performance against competitors * Fill out a testing outline based on the client's request. (Appendix 1)

B. Experimental Design

Usability test needs to be planned through a meeting with different stakeholders involved, including designer, developer, researcher, product manager, and customer support specialist.

1. **Planning Evaluation Test**
2. Participant Recruitment
3. Evaluation Sheet Preparation
4. Test Environment Setup
5. Pilot Test
6. Main Test (Data Collection)
7. Data Analysis
8. Writing a Report

Test Schedule	* Fill out a testing outline based on the client's request. (Appendix 1)
Test Space	* Ensure to have a control room, test room, and waiting room based on the purpose of the test. * If there are not enough rooms, divide a single room into areas. * Divide a room to make sure a facilitator and assistant are hidden from a participant while performing tasks.
Tasks to Evaluate	* Define tasks and features to test. * Choose primary features of a software product to be tested. * Task design - Offer specific goals that users should accomplish. - Design comprehensively to make sure the app's primary features can be used. - Design a session briefly to save participants' time. * Fill out a testing outline based on client's request (Appendix 1).
Test Methodology	* Questionnaires for research * Follow questionnaire/interview(Appendix 2) and think aloud method unless client's requirements.
Define Participating Personnel and Roles	* See role(facilitator and assistant) definition part.
Choosing Participants	* Choose participants - Choose participants who represent primary users. - Can they visit the testing room? - Are they a novice or expert group? * Set number of participants - Choose a number considering the budget for the test. - 80% of usability-related problems can be discovered through 4-5 participants (Nielsen & Morlich, 1990). * Fill out a testing outline based on the client's request. [8 people: 4 men(2 novices, 2 experienced), 4 women(2 novices, 2 experienced)] (Appendix 1).
Participant Incentives	* Discuss with the client * Possible merchandise: Cash, wire transfer, gift cards, presents, mugs, etc.

C. Evaluation Metrics Establishment

Most important step of usability test

1 **Planning Evaluation Test** | 2 Participant Recruitment | 3 Evaluation Sheet Preparation | 4 Test Environment Setup

5 Pilot Test | 6 Main Test (Data Collection) | 7 Data Analysis | 8 Writing a Report

Choose Evaluation Metrics (Variables)	* Participants' feedback can be measured based on evaluation metrics. * Sample metrics - How much time does the user spend to complete a task? - How easily does a user perform tasks? - Success rate ü Do participants use the software as we intended? - Does the software meet users' expectations? * Fill out a testing outline based on the client's request. (Appendix 1 & 2).
Choose Data to Measure	* Questionnaire and interview - Collect participants' background and demographic information. - Complement task quality data with subjective data - Perception on design, potential issues, opinion on a product or service - Questionnaire sheet • Predetermined questions, less focus and biases - Interview (examples) • More open-ended, longer answers • What is a thing about UI that you liked the most? • What was most frustrating? • How could UI better support tasks a user tries to do? * Fill out a testing outline after reviewing the client's requested data.
Establish a Data Measurement Method	* Define target tasks and features to test. * Choose software's primary features to target (A product's feature that users are desired to use). * Implement subjective evaluation (Appendix 2), think aloud, and objective evaluation (Appendix 7)
Define a Data Collection Method	* See report format after reviewing the client's requested items to analyze (Appendix 6 & 7)

D. Participant Recruitment

Even though tests targeted to 5-8 participants are workable, considering the time and budget given for development, about 12 participants are appropriate to ensure credibility.

1 Planning Evaluation Test
2 **Participant Recruitment**
3 Evaluation Sheet Preparation
4 Test Environment Setup
5 Pilot Test
6 Main Test (Data Collection)
7 Data Analysis
8 Writing a Report

Establish Participant Recruting Standards	* Minimum 5-8 participants are appropriate. - Over 75% of usability problems can be found by 5 participants. * Should recruit about 12 people in case of absence, pilot test, and outliers. * Participants should be recruited based on demographic characteristics (age, gender, region, etc.) and primary consumer's distribution rate. * Ideally, it is helpful to draw better insights to recruit expert and novice groups. * Fill out a participant list based on the client's request. (Appendix 8)
Choose How to Recruit Participants	* Where to recruit participants. - Use as many sources as possible. • Friends, colleagues, and family. • Email, phone calls, and surrounding groups. • Bulletin board and social media. - Recruit participants within the target user group.
Choose a Participant Recruiter	* Assistant takes the job.

2

Operation

E. Evaluation Sheet Preparation

Experiment description and checklist should be written in advance to provide participants a consistent amount of information and psychological status.

1 Planning Evaluation Test
2 Participant Recruitment
3 **Evaluation Sheet Preparation**
4 Test Environment Setup
5 Pilot Test
6 Main Test (Data Collection)
7 Data Analysis
8 Writing a Report

Script	* Request a review to the client after writing a script based on (Appendix 6). * Write a script for the test once participant recruiting is started. - Introduction (e.g., 5 mins) - Personal background interview (e.g., 15 mins) - Task performance (e.g., 20 mins) - Follow-up questions (10 mins): questions that draw insightful answers • What is your overall impression of the service • Do you have any concerns about the service? • If you describe this service to your friend, how would you describe it? - Wrap-up (5 mins)
Written Consent	* See format (Appendix 4) * Things to include - Participant's name and contact information - Research objectives - A brief description of participant's assigned tasks - Estimated testing time - Description of expected incentives (payoff, etc.) - Possible inconvenience and risk factor - Overview of data to be collected (think aloud & questionnaire) - A clear explanation about data privacy protection (Who will use and how)
Description Sheet	* See format (Appendix 3) * Things to include - An informal version of pre-consent - A statement that you do not require participants to sign to implement the research. - Describe the core factors of the research. - Suitable to short, informal research.
Questionnaire Sheet	* See format (Appendix 3)
Checklist	* See format (Appendix 5)

F. Testing Environment Setup

Testing environment should be similar to real-use setting as much as possible. Try using a product in the early development phase (i.e. a paper prototype).

1 Planning Evaluation Test
2 Participant Recruitment
3 Evaluation Sheet Preparation
4 **Test Environment Setup**
5 Pilot Test
6 Main Test (Data Collection)
7 Data Analysis
8 Writing a Report

Choose Testing Location	* The assistant choose the place and the facilitator confirms it.
Place Furniture	* The assistant places furniture and the facilitator confirms it.
Install PC and Camera	* Video record a display that the user is using, such as cellphone and smart-watch. * Record the user's facial expression to use their response in analysis.
Make stimulus	* Fill out a testing outline based on the client's request. (Appendix 1).

G. Pilot Test

Before the main test, a pilot test ensures the credibility of experiment results by examining the validity of the testing process.

1 Planning Evaluation Test
2 Participant Recruitment
3 Evaluation Sheet Preparation
4 Test Environment Setup
5 **Pilot Test**
6 Main Test (Data Collection)
7 Data Analysis
8 Writing a Report

Recruit Participants (1-2 people)	* Recruit one participant who can be available quickly.
Pilot Test Objectives	* Check issues in test protocols (script). * Verify the tasks' validity (length, difficulty, etc.) * Verify if the tasks are comprehensive and easily understandable. * Have enough time to revise the discussion guide and prototype by running a pilot session beforehand.
Check Protocols	* See format (Appendix 5) * Check data collecting protocols
Reflect Feedback and Revise	* Use the first test result as a pilot only when a problem occurs and needs to be solved.

H. Main Test (Data Collection)

Conduct usability tests on participants

1 Planning Evaluation Test
2 Participant Recruitment
3 Evaluation Sheet Preparation
4 Test Environment Setup
5 Pilot Test
6 **Main Test (Data Collection)**
7 Data Analysis
8 Writing a Report

Describe the Experiment	* See format (Appendix 3) * Greet the participant, introduce the facilitator, and appreciate their participation. * Make a common ground through a brief chat. * Describe the testing environment.
Fill Out the Written Consent and Have a Q&A Session	* See format (Appendix 4) * Provide pre-consent/test information sheet to the participant. * Answer every question about the study design. - Resolve their anxiety and curiosity as much as possible. * Explain to the participant that you cannot answer their questions when performing tasks.
Describe the Practice/Tasks	* Explain how to perform the tasks * Skip practice session unless it is necessary. * A situation when a practice session is needed - When the participant needs experience or knowledge about how to use software or app to perform the tasks
Break	* 5-minute break
Let Participants Start Performing the Tasks	* Facilitator: Listen, not speak * Think aloud: request participants to say their thoughts * Let participants take a break when they seem stressed or tired. * If participants are having difficulty in the middle of the test or are frustrated to proceed, stop immediately.
Collect Data	* See format (Appendix 4) * Think aloud (audio/video recording -while performing tasks) * Questionnaire and interview (post measurement) - Collect participant feedback
Closing Interview	
Notice	* Encouragement - Encourage participants to express their feelings as much as possible. - Don't be tempted to give clues; encourage participants with nonverbal reactions like nodding and smiling. * Ask open-ended questions. - Don't tell the answer while asking a question. * Know when to stop - If a participant spends too much time without completing a task or is irritable, give them time to relax and move to the next task.

3

Data Analysis

I. Data Analysis

Conduct primary analysis after gathering measured data.

1 Planning Evaluation Test
2 Participant Recruitment
3 Evaluation Sheet Preparation
4 Test Environment Setup
5 Pilot Test
6 Main Test (Data Collection)
7 **Data Analysis**
8 Writing a Report

Save Collected Data	* Conducted by assistant * In terms of task performance data, save files by individual participants and gather them after the whole experiment is over.
Analyze Data (Primary)	* Conducted by facilitator * Typically, the planner of the evaluation study conducts the analysis. * Rationales for objectivity Overall issues (Overall usability of the test) Task-related issues (Certain tasks applied the task) * Make a test result table per task Prioritize key issues of each task. Use it as a primary source of testing result reports. Draw quantitative analysis results through statistical methods.
Quantitative Data Analysis	* Performing time - Helps checking performance time from video recordings
Critical Incident Analysis	* Identifies critical incidents that make cause errors. * Easy to notice at that moment - important to take notes

4

Report

J. Writing a Report

Write a report after collecting data analysis results (Use Appendix 7)

1 Planning Evaluation Test
2 Participant Recruitment
3 Evaluation Sheet Preparation
4 Test Environment Setup
5 Pilot Test
6 Main Test (Data Collection)
7 Data Analysis
8 **Writing a Report**

Writing a Report

* Write a report after analyzing task sessions according to the purpose of use and targets to provide results.

Appendix 7 – Report Format (1-for one participant)

Participant ID : Name : Date : Visiting Hours :

Task Result

Evaluation Scales	Details	
Task type	App( ) / Video ( ): Learn Poomsae 1 using Taekwondo app (example)	
Task start time (a)	(15:30:00)	
Task completion time (b)	(16:00:15)	
Success rate	Complete( ) / Fail( )	
Time spent	(30)min (15)sec	[b – a] (15:30:00 – 16:00:15)
Error rate	(2) errors per screen	number of errors / number of total page used
Critical incident	(Example) - Users should press the "done" button after setting the avatar in an Avatar selection screen. However, the selection was reset since the user pressed the "back" button instead.	

Questionnaire results

Item evaluated			No.	Question	Score	Total score
Usability	Effectiveness		1	Does the system precisely provide information and features?	(75)	(62.5)
			2	Does the system allow you to find features/information you want easily?	(50)	
	Efficiency		3	Does the app/video efficiently support your task performance?	(75)	(87.5)
			4	Does the system allows you to efficiently search information?	(100)	
	Satisfaction	Ease of use	5	As a user, can you use this system efficiently?	(75)	(65)
		Organization of information	6	How satisfying is a grouping of structure, layout, and information?	(50)	
		Labeling	7	Are terms used in the system easily understandable?	(50)	
		Visual appearance	8	Is GUI design attractive? (menu/icon design, colors, position, etc.)	(100)	
		Error correction	9	Does the system trigger mistake?	(50)	
	Learnability		10	How easy is it to learn how to use the system?	(75)	(75)
Localization strategy	Cultural appropriateness		11	Compared to Vietnamese local app/video content, are you familiar with this feature?	(75)	(75)
			12	Are symbols, icons, colors, and images friendly?	(50)	
			13	Is display of unit/date/number/contact/address/name natural?	(75)	
			14	Is formality/grammar/translation of language natural?	(100)	

Interview Results

After usability test, write down users' opinion through brief interviews
(Example) It was hard to understand the terms, as they were too professional.
(Example) The "Okay" button is too small to see.

Appendix

Appendix 1 – Usability Test Outline

Title	Content
Title	(Target and type of usability test)
Writer and Stakeholder(s)	(Anyone who related to the usability test)
Date	(Always keep updated)
Background	(Summary of evaluation study experiences)
Goal	(Summarize in a sentence or list)
Research Question	(Question to answer through the study)
Method	(Briefly write about what, when, how to proceed)
Participants	(Characteristics of target participants and why)
Schedule	(Three key dates; Recruitment start date, test date, result preparation date)
Script Deadline	(Keep it updated until complete writing a whole usability test script)

Appendix 2 – Questionnaire Sheet (For participants)

Participant ID_____ Date of evaluation_____

No.	Questions	Evalaution				
		Al-ways	Some-times	Neu-tral	Rarely	Never
1	Does the system precisely provide information and features?	☐	☐	☐	☐	☐
2	Does the system allow you to find features/in-formation you want easily?	☐	☐	☐	☐	☐
3	Does the app/video efficiently support your task performance?	☐	☐	☐	☐	☐
4	Does the system allows you to efficiently search information?	☐	☐	☐	☐	☐
5	As a user, can you use this system efficiently?	☐	☐	☐	☐	☐
6	How satisfying is a grouping of structure, layout, and information?	☐	☐	☐	☐	☐
7	Are terms used in the system easily understand-able?	☐	☐	☐	☐	☐
8	Is GUI design attractive? (menu/icon design, colors, position, etc.)	☐	☐	☐	☐	☐
9	Does the system trigger mistake?	☐	☐	☐	☐	☐
10	How easy is it to learn how to use the system?	☐	☐	☐	☐	☐
11	Compared to Vietnamese local app/video con-tent, are you familiar with this feature?	☐	☐	☐	☐	☐
12	Are symbols, icons, colors, and images friendly?	☐	☐	☐	☐	☐
13	Is display of unit/date/number/contact/address/ name natural?	☐	☐	☐	☐	☐
14	Is formality/grammar/translation of language natural?	☐	☐	☐	☐	☐

Comments (Other parts that you think they need improvement)

Appendix 3 - Description

Description

Hello, Mr./Ms./Mx. _____.
My name is _____ and I will guide you through this assessment today.

Before we begin, I have some information to give you, which I will read so that I can cover them all.

We're asking our participants today to try out the app/video content we are developing. With this assessment, we want to evaluate whther the app/video is working as we intended. The evaluation will take approximately 30 minutes.

I want to explain now that we are testing the app/video clip, not you. There isn't anything you wrong or lack today. In other words, you don't have to worry about making mistakes here today at all.

We ask you to say what comes to your mind as loudly as possible while using the app/video clip (while performing the task. What you are looking at, what you are trying to do, and what you are thinking. This will be a big help to us.

And don't worry that your comments might offend us. We are conducting this test to improve our products, which means your honest response would be very helpful.

If you have any questions during the test, just ask. We may not be able to answer right always because we are curious about what yo do when there is no one around you to help, but we will answer as soon as the session is over. Also, if you want to take a break, let me know.
If you give us permission, we'll record your screen and conversation. The recording will be used only as a reference for improving the product, and will not be accessed by anyone other than the researcher involved in this assessment.
If it's okay, I'd like you to sign a brief permission form. It is said that we can record the session and only those involved in ths project can access the recording.

Do you have any questions so far?

Appendix 4 – Written Consent

Research subject manual and agreement to use and collect personal information
Research Project Title: Local Usability Test of Development Project for New Southern Expansion of the EdTech Industry

This study is designed to conduct a Vietnamese local usability test for the New Southern expansion of EdTech industry. You should read the instruction and written consent carefully before deciding whether or not to participate in this study. It is important that you understand why this research is being done and what it does. The Principal Investigator [Name of Principal Investigator] conducting this study will explain this research to you. This study will be conducted only for those who have voluntarily expressed their will to participate. If you have any questions, your researcher will explain them in detail. Your signature means that you have been informed of this study and you (or your legal representative) wish to participate in it.

1. Research Background and Purpose

This study is designed to conduct a Vietnamese local usability test for the New Southern expansion of the EdTech industry. This study measures users' perceived effectiveness, efficiency, satisfaction, and learnability while using EdTech industrial content. It will suggest a guideline to develop a more efficient and effective product by reflecting learnability and user satisfaction, which are most important in EdTech industrial content.

2. Target Participants

This study is targeted to vocational trainees in age 20~30 and students aged 10~20 in Vietnam.

3. Participation Period

The participant will be asked to participate for one day by appointment in advance.

4. Giving Up While Participating in Research

The participant can always quit even after participating in this research. Tell your researcher or principal investigator immediately if you would like to give up participating.
Also, the study will be stopped under these situations:
The researcher decides to stop the subject.
- If such a decision is by subjects' adverse reaction, we will stop the study and take appropriate action.

The participant or researcher requests to stop the study for the subject.
The researcher stops the research for any reason.
The participant is unable to participate in the research.
It is agreed that the researcher can stop the participation for any reason.6

5. Risk Factors

If the participant complains of discomfort or requests to stop the experiment, they can stop the experiment at any time. If you wish to stop participating in the study during the experiment, please notify the researcher in charge or the principal investigater immediately. If you have any questions about the risk factors that may arise during your participation in the study, please ask your researcher immediately.

6. Benefit from Participating in Research

There is no direct benefit from the participant's participation in this study. However, it is expected that the information they provide will help establish a guideline that can predict the development of usability assessment indicators. In addition, [/1 day] will be paid for expenses for transportation and others when participating in the research.

7. Disadvantages from Not Participating in Research

The participant has freedom to not participate in this study. Also, there will be no disadvantage for them if they do not participate in thie study.

8. Privacy and Confidentiality Guarantee

In order to pay the participation fee for this study, personal information such as the participant's name, photo, social security number, phone number, and bank account number will be collected, and the data will be stored and deleted after 3 years.
Monitor request and inspection personnel can directly view the research results to verify the reliability of the procedure and data of this research within the scope stipulated by the relevant regulations without infringing on the confidentiality of the research subjects.
Records that can identify the participant's identity will be kept confidential, and their identity will be protected when the results are published.
We will notify the participant promptly when we acquire new information that may affect whether or not they continue to participate. If the participant's participation in the usability assessment is canceled or the agreement is withdrawn, the participant's privacy will be deleted immediately.

9. Participant's Compliance Requirments

Please Check in Empty Boxes(□) Below.	Yes	No
Requirement 1		
Requirement 2		
Requirement 3		

10. Inquiries Reguarding Research

If you have any questions about this research or any issues come up in the middle of the research, please contact the principal investigator immediately.

Name of research primary investigator: Phone number:

Date: Research participant signature

Appendix 5 – Checklist

Check Before Test Date

2 Weeks before test

Check	List
☐	Check content to test (place, product, task, etc.)
☐	Make a list of target tasks
☐	Decide target participants
☐	Ensure to have test room and waiting room for participants
☐	Check test rooms (internet connection, desk, number of chairs)
☐	Ensure to have control room (Similar size with test room is recommended)

A week before test

Check	List
☐	Request feedback to the project team about tasks to test
☐	Decide the type of incentives for participants (cash, gift card, coupon, etc.)
☐	Make a schedule sheet for participant recruitment
☐	Start recruiting and contact to recruited participants (email+call+text messages)

3 Days before test

Check	List
☐	Send email to participants (directions, contact information -- in case the participant is late or absent)
☐	Backup participant list to replace if participants give up the test
☐	Set up the testing environment (install and inspect PC, monitor, S/W, smartphone, furniture, etc.)

1-2 Days before test

Check	List
☐	Contact participation for final double-check + check pre-test questions
☐	Double-check test scenario
☐	Pilot test (whole protocol inspection)
☐	Print out handouts for participants (written consent, questionnaire sheet, evaluation sheet)
☐	Print out handouts for the facilitator (description, test scenario list, script)
☐	Check request documents to be given to participants, such as incentive confirmation
☐	Check snack and beverages for participants
☐	Double-check participants' schedule
☐	Check each personnel's role and waiting spot when participants arrive (Assistant)

Beginning of the day

Check	List
☐	Place handouts for main facilitator
☐	Check communication including internet connection and other devices (PC, smartphone, tablet, etc.)
☐	Check recording condition, including cam and cameras, saving location, saved files (video and audio)
☐	Check possible accidents during test (PC=pop up and virus scan, smartphone=incoming call and text message)
☐	Check operation and saved location of S/W, app, video clip (desktop recommended)

Before test

Check	List
☐	Check the video's starting screen
☐	Check if the participant filled out the pre-test questionnaire

During test

Check	List
☐	Check if the video is being recorded
☐	Make sure the participant to think aloud

After test

Check	List
☐	Stop video recording (assistant)
☐	Save recorded files and check saved location (assistant)
☐	Check if the participant filled out the post-test questionnaire
☐	Brief interview after test is done
☐	Check participant ID on questionnaire sheet and enter to data sheet
☐	Check if data sheet is saved

Appendix 6 – Usability Test Script

(Keep Updated until the Test Date)

	Procedure	Time	Detail
1	Chedklist	(a day before)	Review test protocol through a checklist
2	Participant Recruitment		Participant recruiter recruits backup participants after recruiting eight participants (assistant uploads the recruitment notice)
3	Setting Test Environment		Assistant checks PC and S/W operation on the test date
4	Greet participants	5 mins	Guide participants to the waiting room and explain purpose of the experiment
5	Start Test	2 mins	Introduce research objectives and the facilitator
		5 mins	Explain the test outline and write the consent
		3 mins	Demographic information collecting questionnaire
		10 mins	Explain and practice task (participant)
		5 mins	Take a break
		20 mins	Perform tasks (participant: think aloud, facilitator: observe and take notes, assistant: record video and audio)
		10 mins	Evaluation questionnaire
		5 mins	Final interview (facilitator)
			Save data (assistant)

Appendix 7 – Report Format (1-for one participant)

Participant ID : Name : Date : Visiting Hours :

Task Result

Evaluation Factors	Details	
Task Type	App( ) / Video ( ): Learn Poomsae 1 using Taekwondo app (example)	
Task Start Time (a)	(15:30:00)	
Task Completion Time (b)	(16:00:15)	
Success Rate	Complete( ) / Fail( )	
Time Spent	(30)min (15)sec	[b – a] (15:30:00 – 16:00:15)
Error Rate	(2) errors per screen	number of errors / number of total page used
Critical Incident	(Example) - Users should press the "done" button after setting the avatar in an Avatar selection screen. However, the selection was reset since the user pressed the "back" button instead.	

Questionnaire Results

Item Evaluated			No.	Question	Score	Total score
Usability	Effectiveness		1	Does the system precisely provide information and features?	(75)	(62.5)
			2	Does the system allow you to find features/information you want easily?	(50)	
	Efficiency		3	Does the app/video efficiently support your task performance?	(75)	(87.5)
			4	Does the system allows you to efficiently search information?	(100)	
	Satisfaction	Ease of Use	5	As a user, can you use this system efficiently?	(75)	(65)
		Architecture of Information	6	How satisfying is a grouping of structure, layout, and information?	(50)	
		Labeling	7	Are terms used in the system easily understandable?	(50)	
		Visual Appearance	8	Is GUI design attractive? (menu/icon design, colors, position, etc.)	(100)	
		Error Correction	9	Does the system trigger mistake?	(50)	
	Learnability		10	How easy is it to learn how to use the system?	(75)	(75)
Localization Strategy	Cultural Appropriateness		11	Compared to Vietnamese local app/video content, are you familiar with this feature?	(75)	(75)
			12	Are symbols, icons, colors, and images friendly?	(50)	
			13	Is display of unit/date/number/contact/address/name natural?	(75)	
			14	Is formality/grammar/translation of language natural?	(100)	

Interview Results

After usability test, write down users' opinion through brief interviews
(Example) It was hard to understand the terms, as they were too professional.
(Example) The "Okay" button is too small to see.

Appendix 7 – Report Format (2 - Total)

Usability Test Outline

Test Objectives	(Usability test of Taekwondo learning app)
Test Period	(3 Apr 2022 - 3 May 2022 (30 days))
Target Tasks	(Learn Poomsae 1 using the Takewondo app)
Total Number of Participants	(8)

Demographic Information

Total Number of Participants	8 (Male: 4, Female: 4)
Average Age	25.6 (Male: 25.1, Female: 22.4)
Novice/Experienced	4 Novice, 4 Experienced
Average Time of Experience	23 months (Novice: 2.1 months, experienced: 10.9 months)

Test Results

Evaluation Factors	Participant's ID								Total Score
	A	B	C	D	E	F	G	H	
Effectiveness									
Efficiency									
Ease of Use									
Architecture of Information									
Labeling									
Visual Appearance									
Error Correction									
Learnability									
Cultural Appropriateness									

Important Voice

After usability test, write down users' opinion through brief interviews
(Example) It was hard to understand the terms, as they were too professional.
(Example) The "Okay" button is too small to see.

Appendix 8 – List of Participants

No	Name	Gen-der	Age	Position	Test Date	Description	Photo
1							
2	Tom	male	25	hairdres-sor	15 May	3-year hairdressing experience, completed related education	
3							
4							
5							
6							
7							
8							
9							
10							

Appendix 9 – 1-page Test Overview

Sequence	Step	Details	No.
Planning	Goal Setting	Define goals	
		Set specific objectives	
	Experimental Design	Schedule tests	
		Choose test space	
		Choose target tasks	
		Choose test methodology	
		Define personnel and roles	
	Evaluation Metrics Establishment	Choose evaluation metrics(variables)	
		Choose data to measure	
		Establish a data measurement method	
	Analysis Method Selection	Choose raw data processing method	
		Define data analysis method	
	Participant Recruitment	Establish participant recruting standards	
		Choose how to recruit participants	
		Choose a participant recruiter	
	Review	Make a checklist	
Test Operation	Evaluation Sheet Preparation	Script (Process and protocol)	
		Description sheet	
		Written consent	
		Questionnaire sheet	
		Data sheet	
	Testing Environment Setup	Choose testing location	
		Place furniture	
		Install PC and camera	
	Pilot Test	Recruit participants (1-2 people)	
		Check protocols	
		Reflect feedback and revise	
	Main Test	Recruit participants	
		Describe the experiment	
		Personal backround interview & questionnaire	
		Take a break	
		pre-measurement	
		Task performance (think aloud)	
		post measurement	
		Closing Interview	
Data Analysis	Data Analysis	Enter collected data into sheet	
		Process data	
		Data analysis(Primary statistics)	
		Data analysis(In-depth)	
Report	Report Writing	Write a report