Evaluation Plan: Final

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Reinforce Evaluation Plan

Application of Learning Theories

My artifact was based on VanPatten's processing instruction which is a learning theory for grammar instruction. In my introduction I explain that the grammar module follows the principles of processing instruction. The artifact follows the sequence of incorporating explicit information encouraging students to notice a pattern in the input, followed by a set of referential activities and affective activities (structured input).

Additionally, because this artifact was made for my UDL class, I followed the principles of UDL, like audio for all on-screen text, choice boards, simple language, contrasting colors, scaffolding (cheatsheets), and more.

Alignment to an Instructional Design Model

The ID model that my artifact is aligned to is the ASSURE model that follows the following steps:

1. Analyze learners: My learners needs' were analyzed in terms of profile. My learners are highly motivated adult, military linguists with high aptitude for language learning. They also need to have some kind of prerequisite knowledge of German (e.g., accusative/dative case).
2. State objectives: My objectives are clear. I can make the objectives better by using the SMART model.
3. Select methods: Because I knew that the linguists are in a blended environment, I chose e-learning for the asynchronous activity. This artifact is only supposed to be part of a larger curriculum. This is a self-paced module and the topic is to be discussed and analyzed further in class. The Padlet is for that precisely.

4. Utilize media and materials: This is where I planned the activities and sequence. I chose the instructional strategy (structured input) and created a multimedia-rich artifact that fits with my selected method.
5. Require learner participation: I determined that students will engage with the artifact in a self-paced manner. I have considered how they will work with structured input activities more passively in preparation for output in the classroom. Because this is e-learning, I trust I'll be able to track student progress and engagement though an LMS.
6. Evaluate and Revise: This evaluation plan and its execution will satisfy this step. Learner feedback is very important here.

Revisit Methodology

Overall, my methodology is well aligned to my learning theory and ID model. It tests usability which directly affects UDL principles. A poorly usable system is not UDL-friendly. Poor usability is directly linked to inferior learning outcomes. This will help me assess the "Select methods" and "utilize media and materials" steps.

However, a few modifications come to mind. Currently, my methodology does not test attainment of learning objectives. Because my test users will have the same prerequisite knowledge the end users will have, I can take advantage of their knowledge and do the following:

a) Evaluate how they complete the activities (get things right or wrong)
b) Evaluate how the explicit information helped them learn
c) Evaluate their Stop-and-Thinks
d) Take into consideration perceived attainment of objectives and objective attainment (my eval vs. theirs)

i) A questionnaire for them like the SUS but for attainment of the goal (assess when to use acc. vs. da. with “in”)

ii) A rubric form to assess the attainment of the goal (for me)

iii) ASSURE- biggest differentiator is R (Require student participation). We really have this in the Padlet board. That is actually the assessment.

Evaluation Plan

An integral part of the iterative instructional design cycle is evaluation. To determine the effectiveness of instruction, instructional designers should evaluate instruction both before it is officially delivered (formative evaluation) and after (summative evaluation) (Dick et al. 2021). To inform final design decisions in my chosen artifact, I will conduct a formative usability evaluation for a Storyline module because as a piece of instruction that is to be delivered through technology, it is important to ensure it facilitates knowledge and skill acquisition without overburdening learners' cognitive processes (Burch, 2021).

I created the following Storyline module for the course about Universal Design for Learning: "A day in the life of a Bundeswehr soldier: two-way preposition 'in' for location and direction" (see Appendix A).This self-paced, asynchronous beginner-level module for adult military linguists, presents a basic grammar concept while engaging learners in processing instruction, a leading communicative grammar instruction approach in second language acquisition education that focuses on meaning by teaching grammar in context (Lee & VanPatten, 2003). The module is part of a 12-week blended course intended to bring military linguists from level 0 to 1 on the ILR scale (Interagency Language Roundtable, n.d.), in preparation for an exam. The linguists, who are studying German to become intelligence agents, are expected to work through the presentation of new information and engage in closed and open-ended activities, primarily via activity choice boards for learner practice and an embedded Padlet board for open-ended reflective activities. As part of a larger, blended curriculum, this module will serve as pre-work that the linguists will be required to complete individually, followed by synchronous practice and discussion. As such, the module should be viewed as part of a whole and not as a standalone lesson. I chose to create a pre-work module that is based on

input (any language that learners perceive) because according to VanPatten (2003), processing instruction can be divided into input-based activities, which can be completed individually, and output-based activities completed through interaction. Therefore, to optimize precious class time, I chose to create an input-rich e-learning module that learners can complete asynchronously and individually in preparation for output-based classroom practice.

I selected this artifact for two main reasons. First, as part of the requirements of this project, I needed to choose an artifact created as part of the present master's program. Second, this artifact is my most complex one, and it naturally lends itself to usability testing—my selected evaluation method—due to its interactive nature and its potential to give rise to issues related to ease of use, like problems with navigation, learnability, visual design, and satisfaction (Alshehri et al., 2019; Burch, 2021). Additionally, according to Alshehri et al. (2019), these are the most important categories for learners' acceptance of an e-learning system, besides quality of content. Navigation is crucial to usability because it allows learners to focus on the instructional content rather than remembering how to navigate to and from different parts (Alshehri et al., 2019). Learnability is also important in any digital interface, but particularly in e-learning. Poor learnability causes learners to exert time and effort learning the system rather than the content (Alshehri et al., 2019; Ramadan & Habeeb, 2023). Additionally, visual design is an important factor in e-learning usability because it considers how typography, color scheme, and layout contribute to consistency and clarity (Alshehri et al., 2019). Lastly, when the latter three are efficient and effective, the learning environment is naturally satisfying for users (Ramadan & Habeeb, 2023). Burch (2021) adds that while the above categories are important, mere efficiency and sheer number and frequency of errors are essential to usability evaluation. To record learner experiences that will inform the redesign of my artifact, I seek to conduct an empirical,

formative, qualitative-quantitative usability testing to discover errors in navigation, learnability, visual design, and learner satisfaction (Alshehri, 2019; Becksford, 2021; Burch, 2021; 1 Manik, 2024; Ramadan & Habeeb, 2023).

Evaluation Methodology and Instruments

Keeping the type of selected artifact in mind (e-learning), it is important to optimize its ease of use and intuitiveness (Alshheri et al., 2019; Burch, 2021). By doing so, the design of the learning system frees up learners to focus on the knowledge and skills they are to acquire instead of its structure. Therefore, I will conduct a formative usability evaluation (Budiu, 2017) for my Storyline module using a think-aloud protocol (see Appendix B) incorporating user scenarios (grouped tasks) that are based on priorities identified in my preliminary usability testing (Siegel, 2024), and that stem from problem statements and associated research goals (Farrell, 2017). I chose a formative evaluation because I intend on making significant changes to the product based on the results of this study (Dick et al., 2021). Additionally, although I will collect both qualitative and quantitative data, I have decided to prioritize qualitative data collection because, according to Budiu (2017) and Malamed (n.d.), the process requires fewer users (5) and it is helpful in informing decisions during redesign. There is also consensus that think-aloud interviews are helpful in evaluating digital learning objects because they help discover problems in the layout of the learning environment that pose cognitive obstacles to learning itself (Becksford, 2021; Malamed n.d).

That said, in my hybrid qualitative-quantitative approach, I also intend on quantitatively measuring the ease of use of each scenario and associated tasks using the Single Easy Question (SEQ) method (Laubheimer, 2018). The SEQ method quantitatively measures post-task satisfaction and is administered *during* usability testing (in our case, after each scenario). The

SEQ will shed light on which tasks pose problems and which do not (Laubheimer, 2018). In the present usability evaluation, the SEQ will be embedded within the think-aloud protocol to help measure the ease or difficulty of use of the various tasks within each scenario. Although quantitative information gathered via SEQ is not very useful on its own, when used in conjunction with the question "Why?" it becomes highly informative and qualitative (Laubheimer, 2018). Another quantitative measurement instrument I plan to implement is the System Usability Scale (SUS) questionnaire (Budiu, 2023). The SUS is one of the most popular usability methods that is usually administered during summative evaluation. The SUS is a simple form consisting of 10 statements accompanied by a 1 to 5 Likert scale (*Strongly Disagree* to *Strongly Agree*) (see Appendix C), rating users' perceptions regarding the usability of an interface (Bidiu, 2023).

Supplementing my qualitative study with quantitative measures will allow me to objectively measure how redesign will have improved the product. Although qualitative and quantitative data are not always collected simultaneously (Budiu, 2017), I believe that this hybrid approach will best inform the iterative design process (Manik, 2024). My focus on qualitative data collection will enable me to gain insights into the product by observing issues as users encounter them and by asking follow-up questions to learn more about users' struggles (Malamed, n.d.).

Guiding my usability evaluation are a set of scenarios (see Appendix B) stemming from errors logged during preliminary usability testing and analysis of my selected artifact (Siegel, 2024). These scenarios are derived following the methodology presented by Farrell (2017). This methodology calls for writing problem statements from which research goals are derived. The research goals are then broken down into anticipated user activities, behaviors, and

problem-solving strategies, which, in turn, are aggregated into scenarios that embed within them a series of tasks. The benefit of using scenarios is in enabling users to find their own ways—their own tasks—to work through the system. This allows for a more natural flow and helps the evaluator discover problems that might not be discoverable with pre-determined tasks. The major issues discovered in my preliminary testing fall under the most important categories in usability of e-learning systems: navigation, learnability, visual design, and satisfaction (Alshehri et al., 2019; Burch, 2021). Below are the problem statements and associated research goals (see Appendix B for the scenarios):

Problem Statement A: Navigation and Learnability

In the open-ended stop-and-think activities in the embedded Padlet board on slides titled "Stop and Think A," "Stop and Think B," and "Stop and Think C," learners can't find an easy way to navigate left and right. This causes issues when trying to locate the various threads. Below are associated research goals:

1. Discover where and when the side navigation bar appears.
2. Learn whether the embedded Padlet board is too large for the slide.
3. Find ways to improve the navigation.

Problem Statement B: Visual Design, Learnability, and Satisfaction

The embedded Padlet board is too crowded, and learners have trouble figuring out that all three stop-and-think threads are on the same board. Also, it is not sufficiently clear from the instructions with which thread learners should engage on each stop-and-think slide. This ambiguity and crowding interfere with learners' cognitive perception of the activity and hinder them from completing it. Below are associated research goals and behaviors:

4. Identify extraneous on-screen elements crowding the slides.

5. Learn what is missing in the instructions.
6. Identify design elements to ease learners' cognitive load.

Problem Statement C: Navigation

Throughout the module, there are several navigation issues like ambiguous navigation to and between the various choice board activities. When completing an activity, learners are unsure where they should navigate to next and whether they are required to return to the choice board. Below are associated research goals:

7. Identify all navigation errors and classify them by type and location (which slide).
8. Learn what is confusing about the choice board navigation.
9. Find a navigation scheme that is intuitive and that learners find satisfying in terms of activity completion requirements.

Problem Statement D: Learnability

The play button throughout the lesson enables learners to listen to audio corresponding with the on-screen text looks like an arrow. It is not clear enough for learners from the start that this icon is intended for audio. Below is the associated research goal:

10. Identify an icon that most clearly represents audio.

Timeline

To complete my evaluation, I will follow the timeline below in chronological order:

- Week 1
    - Post on reddit to attract participants
    - Set up session dates and time
    - Make copies of think-aloud forms
    - Create electronic SUS form

- Week 2
    - Conduct usability evaluations (x5)
    - Pay participants
- Week 3
    - Export SUS form data
    - Rewatch each session to code and analyze quantitative and qualitative data
    - Calculate metrics
    - Write report

Because my selected artifact is a digital learning object whose user interface heavily relies on smooth and intuitive navigation, learnability, visual design and satisfaction, I am choosing to conduct a comprehensive usability evaluation. This type of evaluation focuses on the structure and organization of the learning environment and helps identify flaws within it that hinder learning (Becksford, 2021). Because this module requires a high level of user interaction, it is crucial to eliminate distractions and streamline its usability to allow users to focus their cognitive efforts on learning and nothing else.

Sampling Methodology

Because my main instrument for this usability evaluation is an empirical, formative think-aloud protocol, I will need fewer users than in the case of a summative evaluation (LaToza, 2018; Malamed, n.d.; Nielsen, 2000). According to Nielsen (2000), a study with 5 participants will help you discover 85% of all issues. Additionally, the stated requirement for the number of participants for the present project is 5 to 10.

For best results, I will seek users whose profile most closely resembles that of my end users within the constraints of the project (Dick et al., 2021). To do so, I will advertise on the

German subreddit forum that attracts a large adult audience of learners, offering a modest monetary incentive. Although my target audience are military linguists specifically, I will not have access to members of that group for the purposes of this project. Additionally, the project requirement for turnaround time is 2 to 3 weeks—a short window of time for finding participants who share very specific attributes (e.g., age or German language and military background) with the end users. Therefore, I will choose the convenience sampling technique (Alshehri et al., 2019), according to which the evaluator uses participants who are accessible to them.

As part of convenience sampling, I will seek five adult German learners who are comfortable completing individual activities in a digital learning environment. It is important that learners are familiar with German grammar fundamentals because without this prerequisite knowledge, users might experience cognitive overload attempting to make sense of the content. Also, learners who are not comfortable with instruction delivered through technology might struggle more than the typical end users of this artifact who are tech savvy and accustomed to courseware, and who are more likely to finish the module within the estimated completion time of 20-30 minutes.

Analysis Procedures

To analyze my data, I will translate the qualitative data from think-aloud interviews into quantitative metrics as well as collect purely quantitative data—both to help inform redesign decisions. To achieve this, I will calculate issue severity as part of formative evaluation, to help prioritize fixes. Additionally, I will calculate a SUS score to be compared with a new SUS score obtained in a future summative evaluation.

First, I will refer to the think-aloud forms to calculate issue severity. As a first step, I will compare the SEQ scores of the five scenarios, which I will include in the issue severity

calculation method I am borrowing from Rosemberg (n.d.). According to Rosemberg's calculation method (see Appendix D), and referring to the interview recordings, I will list the "Big Stucks" I identified in the think-aloud forms (see Appendix B) in a spreadsheet. Next, I will code the "Stucks" according to the categories of navigation, learnability, visual design, and satisfaction (see Appendix D). In the same spreadsheet, I will include several additional columns, including the slide (where the issue happened), a description of the problem, and participants. In corresponding columns, I will assign the "Stucks" priority on a scale of 1 to 5, according to task critically (how critical the task is to the organization), impact (how much impact it has on task completion), frequency (the number of participants that experienced the "Stuck" divided by the total number of participants), and the SEQ score of the scenario that included the "Stuck." Lastly, I will multiply the 4 variables above (task criticality, impact, frequency, and SEQ score). At this point, I will have a quantitative measure for the severity level of the various "Stucks," which will help me prioritize solutions.

To calculate the SUS score I will compare to a new one during summative evaluation, I will follow the method presented by Budiu (2023). First, I will shift the 1-5 scale to a 0-4 scale. Because the SUS questionnaire has a structure of positively phrased statements (odd) and negatively phrased statements (even), I will keep in mind that the scale for negative statements is essentially inverted. For example, a positively phrased statement with a score closer to 4 (*Strongly Agree*) is a good indication, whereas a negatively phrased statement should have a score closer to 0 (*Strongly Disagree*) (see Appendix C). Consequently, I will subtract 1 from the odd questions (positive) and 5 from the even questions (negative), resulting in 10 questions ranked on a scale from 0 to 4; now I will add up the scores, the sum of which will land on a range between 0 and 40. The next step involves converting this 0-40 scale into a 0-100 scale,

simply because it is easier to work with. To achieve this, I will multiply the sum by 2.5 based on the following equation: 40 x 2.5 = 100. The results will be a SUS score on a range from 0 to 100. I will repeat this calculation for each questionnaire/participant.

Finally, to make sense of the SUS scores of all participants, I will calculate their average and standard deviation. Based on the average, standard deviation, and sample number (5), I will calculate a confidence interval to learn how well the obtained SUS score predicts in relation to the target audience. Next, to translate the obtained SUS score into a meaningful metric, I will assign it a letter grade based on the conversion chart below:

Table 1

SUS Score Range to Letter Grade Conversion

SUS Score Range	Grade
84.1-100	A+
80.8-84	A
78.9-80.7	A-
77.2-78.8	B+
74.1-77.1	B
72.6-74	B-
71.1-72.5	C+
65-71	C
62.7-64.9	C-
51.7-62.6	D
0-51.7	F

Note. Adapted from *System usability scale (SUS)* [Video], by Budiu, 2023. Courtesy of Nielsen Norman Group.

Based on this letter grade, I will determine whether my SUS score is good (B or higher), fair (C range), or worrisome (D or lower) (Sauro, 2018). This score will help me measure the

perceived usability of my artifact and will serve as a good metric against which to measure future SUS scores post redesign.

References

Alshehri, A., Rutter, M., & Smith, S. (2019). Assessing the relative importance of an e-learning system's usability design characteristics based on students' preferences. *European Journal of Educational Research, 8*(3), 839–855. https://eric.ed.gov/?id=EJ1222289

Becksford, L., Hammer, K., & McNabb, K. B. (2021). "I think it could be better": Incorporating user testing into learning experience design. *Weave: Journal of Library User Experience, 4*(2). https://doi.org/10.3998/weaveux.216

Budiu, R. (2017, October 1). *Quantitative vs. qualitative usability testing*. Nielsen Norman Group. https://www.nngroup.com/articles/quant-vs-qual/

Budiu, R. (2023, April 7). *System usability scale (SUS)* [Video]. Nielsen Norman Group. https://www.youtube.com/watch?v=UMv_OW9__qY

Burch, A. (2021, January 28). *From user experience to learner experience: Why usability matters in online learning*. Global Online Academy. https://globalonlineacademy.org/insights/articles/from-user-experience-to-learner-experience-why-usability-matters

Dick, W., Carey, L., & Carey, J. O. (2021). *The systematic design of instruction* (9th ed.). Pearson.

Farrell, S. (2017, September 17). *From research goals to usability-testing scenarios: A 7-step method.* Nielsen Norman Group. https://www.nngroup.com/articles/ux-research-goals-to-scenarios/

Interagency Language Roundtable. (n.d.). *Frequently asked questions*. https://www.govtilr.org/FAQ.htm

LaToza, T. (2018). *Think-aloud usability evaluations* [PowerPoint slides]. George Mason University. https://cs.gmu.edu/~tlatoza/teaching/swe632s18/Lecture%206%20%20-%20Think-aloud%20usability%20evaluations.pdf

Laubheimer, P. (2018, February 11). *Beyond the NPS: Measuring perceived usability with the SUS, NASA-TLX, and the single ease question after tasks and usability tests*. Nielsen Norman Group. https://www.nngroup.com/articles/measuring-perceived-usability/

Lee, J. F., & VanPatten, B. (Eds.). (2003). *Making communicative language teaching happen* (2nd ed.). *Second Language Professional Series - Directions in Second Language Acquisitions.* McGraw-Hill.

Manik, L. P. (2024). Exploring usage-based and usability metrics for user experience for sustainable e-learning systems. *E3S Web of Conferences, 501*, 02003. https://doi.org/10.1051/e3sconf/202450102003

Malamed, C. (n.d.). *Using the think aloud protocol to test usability of learning designs*. The eLearning Coach. https://theelearningcoach.com/elearning_design/think-aloud-protocol/

Nielsen, J. (2000, March 18). *Why you only need to test with 5 users.* Nielsen Norman Group. https://www.nngroup.com/articles/why-you-only-need-to-test-with-5-users/

Ramadan, M. J., & Habeeb, I. Q. (2023). A systematic review in recent trends of e-learning usability evaluation techniques. *AIP Conference Proceedings, 2591*(1), 040032. https://doi.org/10.1063/5.0121800

Rosemberg, C. (n.d.). *Turning usability testing data into action*. Toptal. https://www.toptal.com/designers/usability-testing/turning-usability-testing-data-into-action

Sauro, J. (2018, September 19). 5 ways to interpret a SUS score. MeasuringU. https://measuringu.com/interpret-sus-score/

Siegel, T. (2024). *Usability evaluation final report*. [Unpublished manuscript]. Instructional Design and Technology Master's Program, University of Cincinnati.

VanPatten, B. (2003). *From input to output: A teacher's guide to second language acquisition*. McGraw-Hill.

Appendix A

Learning Artifact

Figure A1

Storyline Module: A day in the life of a soldier in the Bundeswehr - two-way preposition "in" for location and direction

The selected learning artifact is a beginner German grammar module designed as a pre-work activity in a blended curriculum for military linguists. Access it using the link below: https://360.articulate.com/review/content/79d0495d-5be1-4fd0-ab9d-c2ae2e112673/review

Appendix B

Think-Aloud Protocol Form

Table B1

Qualitative and Quantitative Data Collection: Hybrid Think-Aloud Interview/SEQ Form with User Scenarios (Grouped Tasks)

This form will be filled out by the evaluator during each individual think-aloud interview (1 per participant). The notes will later be translated into data and analyzed accordingly. These sessions will take place via videoconference and will be recorded with the participants' consent.

Introduction
1. Greetings, introductions, and pleasantries
2. Build rapport by asking questions and relieving nervousness.
3. Collect participant data: demographic, profession, usage experience with platform, level of prerequisite knowledge about subject matter. a. Have you ever worked with lessons like this before? b. What is your current level of German? c. Are you familiar with accusative and dative cases? d. Have you studied two-way prepositions before?
Session Kick-Off
1. Start the recording.
2. Give background on the artifact and answer any questions.
3. Briefly explain the think-aloud protocol and provide examples things users might say during the interview.
4. Put the participant at ease and ensure that they understand that honesty is very important. Tell them that someone else made the learning artifact so they won't feel like they're offending you by providing constructive feedback or voicing negative sentiments.
Session
SCENARIO 1

Please start the module and complete the first 5 slides. These slides are informative and don't require much interaction besides navigation, playing audio and/or reading. Please tell me what you're seeing and thinking.				
SEQ: How easy or difficult was it to complete this set of tasks?				
1	2	3	4	5
Why?				
❗ **Fill out the following after completing the interview when you rewatch the recording.**				
Task complete?	● Yes	● No		
Accuracy of German	●			
Completion time				
Big "Stucks"	●			
SCENARIO 2				
Please navigate to the Stop and Think A slide and tell me what you see, think, and feel. Read the instructions and try to follow them logically. Tell me what makes sense and what is hard for you to complete.				
SEQ: How easy or difficult was it to complete this set of tasks?				
1	2	3	4	5
Why?				
❗ **Fill out the following after completing the interview when you rewatch the recording.**				
Task complete?	● Yes	● No		
Accuracy of German	●			
Completion time				
Big "Stucks"	●			
SCENARIO 3				

Please navigate to and complete Activity Choice Board A and B, as well as associated activities. Try to click on anything that looks clickable on screen. Try to work through these slides as you would without my help. Please describe in detail what you are doing and what you're having trouble with.				
SEQ: How easy or difficult was it to complete this set of tasks?				
1	2	3	4	5
Why?				
❗ **Fill out the following after completing the interview when you rewatch the recording.**				
Task complete?	• Yes	• No		
Accuracy of German	•			
Completion time				
Big "Stucks"	•			
SCENARIO 4				
Let's wrap up. Please complete the last three slides. These are unlike the others. Again, I want you to tell me in detail what you're perceiving and also how you're feeling about it. Don't hold back.				
SEQ: How easy or difficult was it to complete this set of tasks?				
1	2	3	4	5
Why?				
❗ **Fill out the following after completing the interview when you rewatch the recording.**				
Task complete?	• Yes	• No		
Completion time				
Big "Stucks"	•			
SCENARIO 5				

Now that you've completed the module, please navigate back to slides you found particularly interesting or want to revisit. Please tell me how you're navigating to them and why you are choosing this navigation method. Explain why you are choosing these specific slides to revisit.				
SEQ: How easy or difficult was it to complete this set of tasks?				
1	2	3	4	5
Why?				
❗ **Fill out the following after completing the interview when you rewatch the recording.**				
Task complete?	● Yes	● No		
Completion time				
Big "Stucks"	●			
Wrap-Up				
1. Assess attainment of learning objective: Can you tell how to use the preposition "in" for location vs. direct?				
2. Conclude the session.				
3. Stop the recording.				
4. Explain to the participant that they will be asked to complete the SUS questionnaire now. Stay on the call to ensure that they complete it right after the interview. Allow the users to turn off their cameras while they do so.				
5. Thank the participant and say goodbye.				

Note. Adapted from *Think-aloud usability evaluations* [PowerPoint slides], by LaToza, 2023. George Mason University.

Appendix C

System Usability Scale Questionnaire

Table A1

Quantitative Data Collection: Post-Session SUS Questionnaire

This 10-part questionnaire will be administered upon the completion of the think-aloud interview to collect quantitative data on learners' perceived usability of the e-learning module. Learners will rate their level of agreement on a scale of 1 to 5, with 1 standing for Strongly Disagree and 5 representing Strongly Agree.

1. *I think that I would like to use this e-learning module or similar ones frequently.*				
1	2	3	4	5
2. *I found the system unnecessarily complex.*				
1	2	3	4	5
3. *I thought the system was easy to use.*				
1	2	3	4	5
4. *I think that I would need the support of a technical person to be able to use this system.*				
1	2	3	4	5
5. *I found the various functions in this system well integrated.*				
1	2	3	4	5
6. *I thought there was too much inconsistency in this system.*				
1	2	3	4	5
7. *I would imagine that most people would learn to use this system very quickly.*				
1	2	3	4	5
8. *I found the system very cumbersome to use.*				

1	2	3	4	5
9. I felt very confident using the system.				
1	2	3	4	5
10. I needed to learn a lot of things before I could get going with this system.				
1	2	3	4	5

Note. Adapted from *System usability scale (SUS)* [Video], by Budiu, 2023. Courtesy of Nielsen Norman Group.

Appendix D

Issue Severity Analysis

Table D1

Issue Identification System for Determining Issue Severity

I will use this template to calculate the severity of the issues I discover in the think-aloud interviews. This system will help me prioritize fixes in the redesign process. The table contains examples for illustration purposes only. My analysis will include five participants instead of three.

#	Task - "Big Stuck" ID	Task Criticality	Slide	Description	Impact	SEQ Difficulty	P1	P2	P3	Frequency	**Severity**
1	Navigation	4	Objectives	The previous and next arrows are disabled.	5	5	x	x	x	100%	**100**
2	Learnability	3	Explicit Information	The play button looks like an arrow and users can't tell that it's to play audio.	3	1		x	x	66%	**5.94**
3	Visual Design	4	Padlet	The colors aren't consistent with the rest of the module.	3	3	x			33%	**11.88**
4	Satisfaction	2	Self-Assessment	There is nothing that indicates that you've completed the assessment besides checking the boxes.	4	4	x	x		66%	**21.12**

Note. Adapted from *Turning Usability Testing Data Into Action* by C. Rosemberg, n.d., Toptal. Adapted from https://www.toptal.com/designers/usability-testing/turning-usability-testing-data-into-action.