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D 4.2 Evaluation procedure and criteria for monitoring and evaluating digital educational content

Document describing the evaluation procedure and criteria for monitoring and evaluating digital education content

30.12.2024 | Lillian Gran

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Table of Contents

About the Atollo Project

The Atollo project aims to empower learners with difficulties by creating inclusive digital materials. Through a consortium of partners from Croatia, Bulgaria, Austria, Germany, Iceland, Norway, Ireland and Australia, including an EdTech company, universities, schools for children with SEN, public authorities, and an NGO, we will analyse and compare existing programmes, develop innovative digital tools and create high-quality digital educational content. We will pilot and test the digital materials and evaluate their implementation and then focus on the improvement of developed digital materials based on the feedback from the learners, teachers and experts. The result of the scientific evaluation of the use of digital materials will be an inclusive digital education toolkit that will contain advice and instructions for everyone who works with and uses digital educational materials for children with difficulties. We will use a user-centred design approach to ensure that the materials are accessible and inclusive for learners with various types of difficulties. This iterative process of improvement will help us create digital materials that are effective and engaging. Furthermore, the project will provide capacity building for teachers to use developed digital materials effectively. The expected results include a cutting-edge set of digital learning materials, capacity building for teachers and an inclusive digital education toolkit. We will share our findings and outcomes through various channels to reach a wider audience, including policymakers and education institutions, and create awareness about the importance of inclusive digital materials for learners with difficulties. The project will have a direct impact on the involved schools and their learners as well as a broader impact on this underrepresented group of children, their educators and wider academic community through a research paper derived from this project.

This document represents the D4.2 Evaluation procedure and criteria for monitoring and evaluating digital educational content of the Atollo project no. 101132759, financed under ERASMUS-EDU-2023-PI-FORWARD call, topic: ERASMUS-EDU-2023-PI-FORWARD-LOT1.

To evaluate the digital content and achieve the desired outcomes, digital educational units will be tested in at least three schools across three different countries over the course of a school term. Trained teachers will implement the content in classrooms with learners who have difficulties. The primary objective of this pilot is to assess the effectiveness of the digital units in enhancing learning outcomes and engagement for learners with difficulties, while also identifying areas for improvement or adjustment.

During the pilot phase, teachers will utilise the evaluation components embedded within each digital unit to provide insights on how learners respond to the content. This feedback will be analysed and used to refine the digital units, ensuring they are inclusive, effective, and tailored to meet the needs of students with cognitive and/or learning difficulties.

The pilot testing will culminate in a comprehensive report summarising the findings. This report will highlight the effectiveness of the digital units in improving learning outcomes and engagement, as well as outline recommended improvements or adjustments to optimise their impact.

A detailed evaluation framework and set of criteria has been developed to oversee and assess the piloting of digital educational content in schools. The purpose is to ensure the pilot programme is implemented successfully and to identify any necessary adjustments or enhancements. Universities will oversee the pilot's execution in schools and gather input from teachers who utilise the digital content in their classrooms. Upon the pilot's completion, universities will deliver a comprehensive evaluation report summarising the outcomes and highlighting areas for refinement.

Additionally, the technical aspects of the digital content will undergo assessment. To gather detailed feedback, focus groups with teachers will be conducted, allowing them to provide input on each digital unit and its components. This feedback will offer valuable insights to refine the digital content further, ensuring it is effective, inclusive, and responsive to the needs of learners with difficulties.

The Atollo Project Consortium

The Atollo project consortium is an Erasmus Partnership, bringing together 12 partners.

No	Partner	Acronym	Country
1	PROFIL KLETT D.O.O.	PK	HR
2	SVEUCILISTE U ZAGREBU	UNIZG ERF	HR
3	University of Inland Norway	INN UNI	NO
4	REGIONALEN TSENTAR ZA PODKREPA NA PROTSESA NA PRIOBSHTAVASHTO OBRAZOVANIE SOFIA GRAD	RCSIE	BG
5	SKOLA ZA ODGOJ I OBRAZOVANJE PULA	STE PULA	HR
6	HASKOLI ISLANDS	UI	IS
7	MATRIX INTERNET APPLICATIONS LIMITED	MATRIX	IE
8	PADAGOGISCHE HOCHSCHULE OBEROSTERREICH	PH OOE	AT
9	MINISTARSTVO RADA, MIROVINSKOGA SUSTAVA, OBITELJI I SOCIJALNE POLITIKE	MRSOP	HR
10	STADT FRANKFURT AM MAIN DER MAGISTRAT, CHARLES HALLGARTEN SCHULE IN GERMANY	CHS	DE

No	Associated Partner	Acronym	Country
11	CENTRAL QUEENSLAND UNIVERSITY	CQU	AU
12	NATSIONALNA ASOTSIATSIA NA RESURSNITE UCHITELI	NART	BG
13	DIGITAL TECHNOLOGY SKILLS LIMITED	DTSL	IE
14	TERAWE TECHNOLOGIES LIMITED	TERAWE	IE

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Introduction to WP4 and the Evaluation Procedure and Criteria for Monitoring and Evaluating Digital Educational Content

Work Package 4 (WP4) of the Atollo project focuses on the development, piloting, and evaluation of digital educational content, with a strong emphasis on quality assurance. The main goal of WP4 is to pilot innovative digital learning materials specifically designed for learners with cognitive and/or learning difficulties, aiming to provide them with a more engaging and personalised learning experience. By testing these materials in real-world educational settings, the WP4 seeks to collect valuable feedback that will inform the optimisation of the materials' design.

In addition to piloting, WP4 will conduct a comprehensive evaluation of the effectiveness of these materials in improving learning outcomes, as well as fostering increased engagement and participation in the classroom. This evaluation will involve a combination of assessments, surveys, observations, and focus groups with educators, learners and parents or guardians. These efforts will provide crucial insights into the impact of digital content on education for students with difficulties.

The deliverables of WP4 include:

- D4.1: A report summarising the findings from the pilot testing (November 2025)

- D4.2: Evaluation procedure and criteria for monitoring and evaluating digital educational content (December 2024)

- D4.3: Set of optimised digital education content units, along with guidelines on their use (March 2026)

- D4.4: Development of an Inclusive Digital Education Toolkit (May 2026)

- D4.5: Educational sessions for parents/guardians (June 2026)

This comprehensive approach aims to ensure that the digital educational materials are both effective and inclusive, fostering a more equitable learning environment for all students.

The evaluation procedure and criteria for monitoring and evaluating digital educational content (further in the text: Evaluation Framework) of the Atollo project is designed to assess the effectiveness of digital educational materials tailored for students with difficulties. This framework will be used to collect comprehensive feedback from teachers, learners and parents/guardians, allowing for a detailed evaluation of how these resources impact

learning outcomes, engagement, and classroom participation. By utilising a combination of assessments, surveys, observations, and focus groups, the evaluation tool aims to provide valuable insights into the effectiveness of the materials, guiding future improvements, and ensuring their alignment with the needs of learners with difficulties.

The evaluation framework is designed to systematically assess the implementation and impact of digital learning materials developed within the project. This framework focuses on collecting feedback from students, parents/guardians, teachers and school leaders, examining the effectiveness of the digital resources in enhancing educational experiences for learners with difficulties. Through questionnaires, interviews, classroom observations and technical monitoring, the evaluation aims to provide a clear picture of how well these tools are integrated into school environments, their influence on learning outcomes, and the overall user experience. The process ensures GDPR compliance and data-driven insights to guide future improvements. The focus is on evaluating user satisfaction, the effectiveness of digital tools in improving learning outcomes, and identifying any procedural or technical challenges encountered during the project. This structured approach ensures a thorough assessment of the project's impact.

WP4 has identified several critical risks and proposed mitigation measures. One significant risk is that not all digital educational materials may be developed on time, or the associated costs may significantly exceed the planned budget. Considering the number of units to be developed, this risk is assessed as medium in terms of both likelihood and impact. To address this, WP2 in collaboration with WP3, should prioritise the materials to be developed. The pilot programme can proceed even if not all units are completed on schedule. The coordinator, who has extensive experience in developing digital educational materials, has committed to covering any additional costs associated with the development of these materials.

Another identified risk is that partners responsible for piloting the digital educational materials may request a change to the timeline for the launch and pilot programme due to incomplete preparation work. This risk is assessed as medium in both likelihood and impact. WP4 suggests that the pilot programme timeline could be adjusted to run in the subsequent term; however, this would necessitate completing certain activities after the project's official end date.

The rationale for this deliverable lies in the need to develop and assess digital educational content that is specifically designed to meet the needs of students with difficulties. Work Package 4 of the Atollo project is dedicated to creating innovative, accessible digital learning materials that enhance the learning experience for these students, fostering a more personalised and engaging environment. By piloting these materials in real-world classrooms, WP4 aims to gather valuable feedback from both teachers and learners, which will be used to refine and improve the content. The evaluation process will include a combination of assessments, surveys, classroom observations, and focus groups, ensuring a comprehensive understanding of how these materials affect learning outcomes, participation, and engagement. The final goal is to determine the effectiveness of the digital resources in improving educational experiences for students with difficulties, and to ensure that they contribute to more inclusive, equitable learning environments.

The Evaluation Framework

The evaluation framework for Work Package 4 (WP4) has been designed to systematically assess the usability, effectiveness, and integration of digital educational materials developed for learners. The process builds on evidence-based methodologies for educational evaluation, combining quantitative and qualitative approaches to ensure a holistic understanding of the tools' impact. Below, each evaluation area is described with references to relevant academic literature.

No	Evaluation Area	Method	Target Group	Purpose
1	Feedback Collection	Online Questionnaire	Students, Teachers, Parents, School Leaders	Assess satisfaction with digital tools, ease of use, and GDPR compliance.
2	Insight Gathering	Semi-Structured Interviews	School Leaders, Teachers	Explore challenges, benefits, pedagogical impact, and GDPR compliance in digital tool use.
3	Real-Time Assessment	On-site Observations	Schools (Classrooms)	Observe tool usage, teacher-student interactions, and alignment with curriculum goals.
4	Technical Evaluation	Analytics Monitoring	Students, Teachers	Monitor platform performance, user engagement, and technical stability through analytics.
5	Process Efficiency	Process Documentation Review	School Leaders, Teachers	Evaluate integration, challenges, solutions, and parental consent processes.

6	Legal Compliance	Approval Process Review	Schools, Parents	Ensure GDPR compliance through reviews of consent forms and approval documentation.
7	Usability Testing	Think-Aloud Protocol	Teachers, Parents, Guardians	Identify usability issues and suggest improvements through real-time cognitive feedback.

1. Online Questionnaires

The use of online questionnaires is a widely recognised method for collecting feedback efficiently and inclusively (Bryman, 2016). This evaluation area seeks to capture satisfaction with the digital tools, ease of use, and compliance with GDPR guidelines. Metrics include overall user satisfaction and perceived usability. Tools like Nettskjema, online form, from Norway and IZZI are employed to facilitate accessibility and streamline data collection. Country project leaders oversee this process. As shown in research by De Leeuw (2018), online surveys provide reliable data while accommodating diverse user groups.

2. Semi-Structured Interviews

Interviews provide deeper insights into the challenges and benefits of integrating digital tools into teaching practices. Semi-structured formats, as suggested by Kvale and Brinkmann (2015), enable flexibility while maintaining a focus on key themes such as pedagogical impact and GDPR compliance. Interviews will be conducted remotely via Zoom or Teams, or in person, depending on logistical constraints. The data collected will help identify shifts in teaching methodologies and barriers to implementation. This aligns with the qualitative research practices recommended by Creswell and Poth (2018).

3. On-Site Observations

Observation is a powerful method for evaluating real-world interactions with educational tools. According to Yin (2017), this approach allows researchers to capture behaviours and contextual factors that other methods might miss. Observers will document tool usage frequency, teacher-student interactions, and alignment with curriculum goals. Field visits ensure a grounded understanding of the materials' effectiveness in authentic classroom settings.

4. Analytics Monitoring

Technical monitoring uses analytics to evaluate the digital platform's performance, user engagement, and technical stability. Metrics such as time spent on applications, active users, and reported issues provide objective insights into usability (Kuh et al., 2001). IZZI Analytics facilitate the collection and analysis of these data points. This approach is consistent with evidence-based practices in digital education research (Veletsianos, 2020).

5. Process Documentation Review

Analysing process documentation helps evaluate the practicality of implementing digital tools. Key questions focus on the ease of integration, documentation of challenges and solutions, and parental consent processes. Process evaluations, as noted by Rossi, Lipsey, and Freeman (2018), provide critical insights into how well project

objectives are operationalised in practice. Internal reports serve as the primary data source, with project leaders responsible for the review.

6. Approval Process Review

Ensuring GDPR compliance is a legal and ethical imperative. This evaluation area assesses data handling practices, school approvals, and parental consent procedures. By reviewing content forms and approval documentation, GDPR legal advisors help ensure adherence to regulatory standards. Legal compliance frameworks in educational contexts are extensively discussed by Vayena et al. (2018).

7. Think-Aloud Protocol

The think-aloud protocol, as described by Ericsson and Simon (1993), captures participants' cognitive processes while they interact with digital tools. This method identifies usability issues and suggests improvements based on real-time feedback. Audio recordings of participants' verbalised thoughts during task completion provide rich qualitative data. This approach has been validated in usability testing across various educational technologies (Nielsen, 1994).

The evaluation criteria for WP4 draw on established methodologies to provide a robust assessment of digital educational tools. By combining surveys, interviews, observations, and technical analytics, the framework ensures a comprehensive understanding of the tools' impact on teaching and learning. Each step adheres to best practices in educational research and evaluation, as supported by the academic literature, ensuring reliable and actionable insights for future development.

Ethical Considerations

In designing the evaluation process, we have prioritised the well-being and comfort of the students, given their special needs. This means that most feedback from students will primarily be gathered indirectly to avoid placing them in potentially stressful situations. As a result, the main sources of feedback will be teachers, parents, and school leaders, who can provide valuable insights into the students' experiences with the digital tools. Observation as an evaluation method will also allow us to have a better understanding of their engagement and reactions to the digital materials. However, students may be directly included in the feedback process through adapted questionnaires designed to be sensitive to their needs. Following the principle of "nothing about us without us", we encourage teachers to include their students with difficulties in the evaluation of digital educational materials, when deemed appropriate and possible.

Evaluation Criteria

No	Evaluation Area	Method	Target Group	Purpose	Key Metrics/Questions	Platform/Tool	Responsibility
1	Feedback Collection	Online Questionnaire	Parents, School Leaders Authors, Students	Collect feedback on digital materials, user experience, and GDPR compliance	- Satisfaction with digital tools - Ease of use - GDPR understanding	Google Forms / IZZI Online form	Country Project Leaders
2	Insight Gathering	Semi-Structured Interviews	School Leaders, Teachers Authors	Gain in-depth insights into challenges and project impact	- Changes in teaching methods - Integration of digital tools - GDPR and parental approvals	Zoom/Teams (Remote) or In-person	Country Project Leaders
3	Real Time Assessment	Observation (On-site)	Schools (Classrooms)	Assess real-time use of digital materials	- Frequency of tool use - Teacher-student interaction - Integration into the curriculum	Field visits	Country Project Leaders
4	Technical Evaluation	Analytics Monitoring	Students, Teachers	Evaluate app/platform usage, time spent, and technical issues	- Time spent on apps - Active users - Technical issues (e.g., crashes)	IZZI analytics	Digital Departments/ School IT
5	Process Efficiency	Process Documentation Review	School Leaders, Teachers	Evaluate app/platform usage, time spent, and technical issues	- Time spent on apps - Active users - Technical issues (e.g., crashes)	Internal reports	Project leaders
6	Legal Compliance	Approval Process	Schools, Parents	Ensure legal compliance in data collection and use	- School approval - Data handling practices	Content forms	GDPR Legal Advisors
7	Usability Testing	Think-Aloud Protocol	Teachers, Parents, Guardians	Explore cognitive processes and interface usability through task completion	- Verbalized thought processes - Issues encountered - Suggestions for improvement	Audio recording	Country Project Leaders

This table aligns key evaluation components with their respective methods, target groups, and tools, ensuring comprehensive and systematic data collection.

Data Collection Methods

1. Questionnaire

Target Group: Teachers, Parents, and School Leaders from three schools

Description:

Online questionnaires are a quantitative method enabling broad data collection from various stakeholder groups. According to Bryman (2016), these tools are effective for gathering standardised data that can be statistically analysed to identify trends and patterns. In this context, questionnaires assess user experience, satisfaction with digital tools, and understanding of GDPR compliance.

Relevance in Research:

- Quantitative Precision: Questionnaires provide structured data that are easy to analyse (Creswell, 2018).
- Scalability: Online questionnaires are particularly efficient in large educational projects, reaching geographically dispersed respondents quickly (De Leeuw, 2018).

Practical Use:

Platforms such as Google Forms and IZZI allow customisation for different target groups, and results can be exported for further analysis. Project leaders are responsible for designing and validating targeted questionnaires.

Example Questions for Teachers, Parents, and School Leaders:

Section 1: General User Experience

1. How easy was it to navigate the digital tools? (scale from Very easy to Very difficult)
2. Did the digital tools align with the educational needs of the students? (scale from Strongly agree to Strongly disagree)

3. How effective were the tools in engaging students with special needs? (scale from Not effective to Very effective)

Section 2: Satisfaction with Digital Tools

4. How satisfied are you with the overall functionality of the digital tools? (scale from Very satisfied to Very dissatisfied)
5. Did the digital tools support the learning objectives of the curriculum? (Yes, completely – Not at all)
6. Were the instructions for using the tools clear and easy to follow? (scale from Strongly agree to Strongly disagree)

Section 3: Technical Usability

7. Did you encounter any technical issues while using the tools? (Yes/No)
   a. If yes, please describe the issue.
8. How responsive was the support team in addressing technical problems? (Very responsive – Not responsive)

Section 4: Accessibility and Inclusivity

9. Do you feel the digital tools were inclusive for students with difficulties? (Strongly agree – Strongly disagree)
10. Were there any features of the tools that posed challenges for students with difficulties? (Yes/No)
    - If yes, please specify.

Section 5: GDPR and Data Privacy

11. Did you feel confident that the digital tools complied with GDPR requirements? (Yes/No)
12. Were parents adequately informed about data privacy policies? (Strongly agree – Strongly disagree)

Section 6: Suggestions for Improvement

13. What improvements would you suggest to enhance the effectiveness of the digital tools? (Open-ended)
14. Are there any additional features you believe should be included in the digital tools? (Open-ended)

Practical Note:

The questionnaire can be tailored for parents and school leaders by adapting language to reflect their specific roles and experiences. For example, parents might be asked about their perceptions of how the tools supported their child's learning, while school leaders could be queried on the tools' alignment with school policies and overall educational goals. To receive direct feedback from students, when possible and appropriate, an adapted questionnaire will be used. As pupils with complex educational needs (multiple disabilities) may not be able to answer the usual questionnaires, the evaluation method is adapted to include pictures. Children with multiple disabilities, even if they do not communicate verbally, can use different forms of communication (Celizić, 2022). Most of them understand and use pictures to learn and to answer questions. Therefore, we will use pictures at the

end of lessons for students to give their feedback. Pictures as symbols are a universal form of communication, so most students will be able to evaluate digital learning units.

Example Questions for Students:

How did this lesson **help you learn**?

| Excellent | Well | Not well |

How easy was it to **use the technology** for this unit?

| Very easy | Easy enough | Not easy |

2. Semi-Structured Interviews

Target Group: School Leaders and Teachers

Description:

Semi-structured interviews combine flexibility and structure, allowing for in-depth exploration of perceptions and experiences related to digital tools in teaching. Kvale and Brinkmann (2015) highlight that this method is ideal for understanding complex phenomena such as the integration of technology in pedagogy.

Relevance in Research:

- In-Depth Data: The method uncovers detailed perspectives and challenges often overlooked by quantitative approaches (Yin, 2017).

- Reflexive Dialogue: Interviews facilitate an exploratory dialogue that can be adjusted based on participant responses (Creswell & Poth, 2018).

Practical Use:

Interviews are conducted via platforms such as Zoom or Teams to enable participation from various locations. Country project leaders ensure data collection follows a consistent approach.

Example Questions for Semi-Structured Interviews:

Section 1: General Perceptions of Digital Tools

1. How would you describe your overall experience using the digital tools in your teaching?

2. What do you see as the main benefits of these tools for students with special needs?

3. Have the tools changed your teaching practices? If so, how?

Section 2: Pedagogical Impact

4. How do you think the digital tools align with the curriculum and learning objectives?

5. Have you noticed any changes in student engagement or learning outcomes since implementing the tools?

6. In your opinion, do the tools adequately address the diverse needs of students with difficulties?

Section 3: Challenges and Barriers

7. What challenges have you encountered when integrating these tools into your teaching?

8. Are there specific features of the tools that you find difficult to use or implement effectively?

9. How have students responded to the tools, and have there been any noticeable difficulties or resistance?

Section 4: Usability and Technical Support

10. How easy is it to navigate and use the digital tools on a daily basis?

11. Have you received sufficient training and support to use these tools effectively?

12. What improvements would you suggest to enhance the usability or functionality of the tools?

Section 5: Ethical and Privacy Considerations

13. How do you ensure that student data is handled securely and in compliance with GDPR regulations?

14. Do you feel the tools provide adequate safeguards to protect the privacy of students with special needs?

Section 6: Future Recommendations

15. What features or resources would you like to see added to the tools in the future?

16. Do you have any recommendations for improving the implementation of these tools in schools?

17. What advice would you give to other teachers or school leaders considering adopting these tools?

These questions provide a structured yet flexible framework, allowing interviewers to explore the participants' unique perspectives while adapting to their responses for deeper insights.

3. Observation

Target Group: Schools (Classrooms)

Description:

Observations are used to capture the authentic use of digital tools in educational settings. This method provides insights into how teachers and students interact with technology in real time, essential for evaluating practical implementation (Ericsson & Simon, 1993).

Relevance in Research:

- Naturalistic Approach: Observations provide a naturalistic glimpse into context-specific processes (Bryman, 2016).
- Concrete Indicators: Focus on frequency, quality, and relevance of tool usage yields actionable data (De Leeuw, 2018).

Practical Use:

Field visits are organised by country leaders, who systematically document observations for further analysis and reporting.

Instructions for Observers:

1. Familiarise yourself with the tools and lesson plan before the observation.
2. Use the categories and indicators as a guide to ensure systematic and comprehensive data collection.
3. Document detailed notes and include qualitative insights or examples.
4. Summarise key findings and trends after the observations.

Research Observation Scheme

Observation scheme for classroom use of digital tools.

Category	Indicators	Notes / Examples
Classroom Setup	- Availability of digital tools (e.g., tablets, smartboards, software).	Are the tools functional and accessible for all students?
	- Arrangement of the classroom for tool usage.	How is the classroom physically organised to facilitate the use of technology?
Teacher Engagement	- Frequency of tool usage during the lesson.	How often does the teacher use the digital tools within the lesson?
	- Purpose of tool usage (e.g., teaching, assessment, feedback).	What specific activities or objectives is the teacher addressing using the tools?
	-Teacher's confidence and fluency in using the tools.	Does the teacher appear comfortable and skilled in operating the tools?
Student Interaction	- Frequency of student interaction with the digital tools.	How many students are actively using the tools during the observation?
	- Quality of interaction (e.g., independent work, collaboration, guided by teacher).	Are students using the tools independently, in groups, or under direct teacher guidance?
	- Engagement levels (e.g., attentiveness, participation).	Do students appear focused and engaged while using the tools?
Accessibility	- Inclusivity for students with special needs.	Are there specific accommodations or adjustments made for students with difficulties?
	- Ease of use for students with diverse abilities.	Are students with special needs able to navigate and interact with the tools effectively?
Technical Functionality	- Stability of the tools (e.g., technical issues, speed).	Are there any observable technical problems (e.g., crashes, slow performance)?
	- Compatibility with classroom activities.	Do the tools integrate seamlessly with the planned lesson activities?
Alignment with Learning Goals	- Relevance of tool usage to curriculum objectives.	Are the digital tools used to directly support the intended learning outcomes?
	- Effectiveness in facilitating understanding or skill acquisition.	Do the tools appear to enhance student comprehension or skill development?
Teacher-Student Interaction	- Guidance provided by the teacher during tool usage.	Does the teacher provide sufficient instruction or support when students use the tools?
	- Feedback mechanisms using the tools (e.g., quizzes, formative assessments).	Are there any digital features that allow for immediate feedback to students?
Observational Notes	- Unplanned occurrences or anomalies.	Record any unexpected events or behaviours related to tool usage.
	- General observations and impressions.	Provide additional context or qualitative insights about the classroom environment or tool implementation.

4. Technical Monitoring (IZZI Analytics)

Target Group: Students and teachers

Description:

Analytics tools provide objective data on usage patterns of digital platforms. By analysing variables such as time spent on platforms and the number of active users, technical barriers and strengths can be identified (Nielsen, 1994).

Technical monitoring is an essential component of our evaluation framework, specifically focusing on the IZZI analytics to gain a deeper understanding of user interactions with our digital platforms. This method allows us to evaluate critical metrics, such as the time users spend on the platform, the frequency of logins, and the number of active users. By analysing usage patterns, we can identify trends that inform us about the engagement levels of students and educators with the digital learning materials. Additionally, monitoring common technical issues, such as app crashes, enables us to address potential barriers to effective use and ensure a seamless experience for all users. This data-driven approach is crucial for optimising the performance of our digital tools and enhancing their overall impact on the learning process.

Relevance in Research:

- Data-Driven Insights: Analytics enables monitoring of platform performance and user patterns (Rossi et al., 2018).
- Problem-Solving: Identifying technical issues such as crashes or connection problems supports platform improvements.

Practical Use:

IZZI Analytics is used to collect and visualise data. IT departments are responsible for monitoring and reporting.

Purpose: To evaluate the time spent on digital platforms and apps, usage patterns, and any technical issues.

Metrics monitored:

- Time spent on the platform
- Number of logins and active users
- Common technical problems reported (e.g., app crashes)

5. Process Documentation Review

Target Group: School Leaders and Teachers

Description:

A review of process documentation assesses how existing workflows and documentation support the implementation of digital solutions. This method ensures that processes are efficient and well-documented (Veletsianos, 2020).
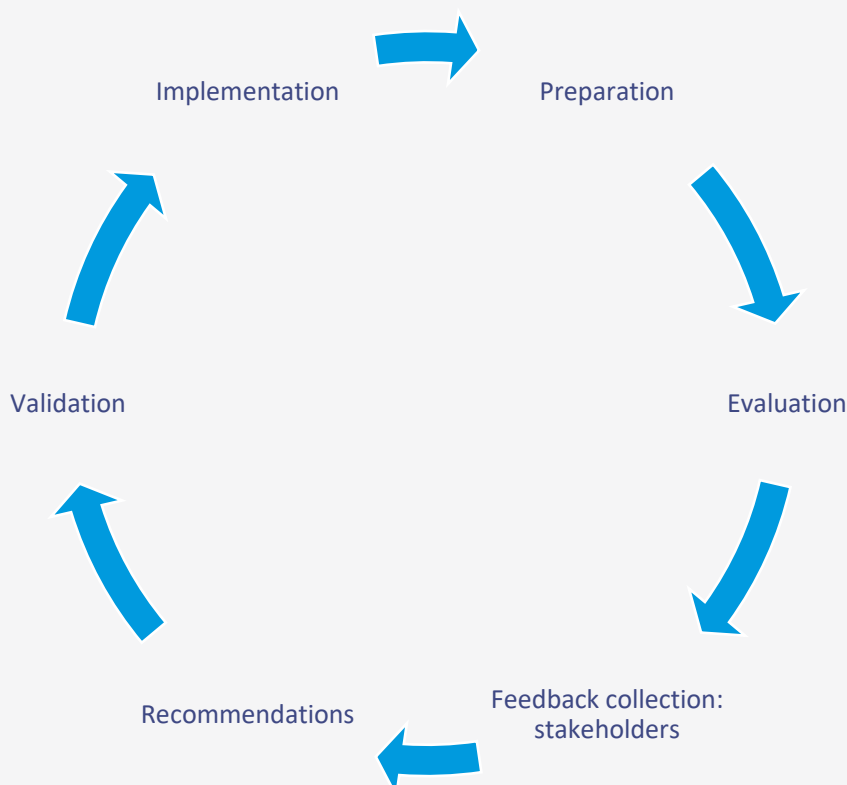
Relevance in Research:

- Process Optimisation: Identifies bottlenecks and inefficiencies in procedures (Bryman, 2016).
- Quality Assurance: Contributes to standardising practices and reducing error margins (Yin, 2017).

Practical Use:

Internal reporting is key, with project leaders driving the review process forward.

A process documentation review is a systematic assessment aimed at evaluating the accuracy, completion, and efficiency of documented procedures within the organisation. This process is crucial for ensuring that workflows align with organisational goals, comply with regulations, and facilitate operational consistency.

Key Steps in Process Documentation Review:

Implementation → Preparation → Evaluation → Feedback collection: stakeholders → Recommendations → Validation → (Implementation)

1. Preparation:
   Identify the scope and purpose of the review. Gather relevant documentation (e.g., standard operating procedures, workflows, and guidelines).

2. Evaluation:
   Assess the clarity and structure of the documentation. Verify whether the processes align with organisational goals and industry standards. Check for updates to reflect current practices and regulatory compliance.

3. Feedback Collection:
   Engage stakeholders, including process owners and users, to identify areas of improvement. Note gaps, redundancies, or ambiguities in the documentation.

4. Recommendations:
   Provide actionable suggestions for enhancing process efficiency and clarity. Prioritise revisions based on urgency and potential impact.

5. Validation:
   Ensure updates are tested and approved by relevant stakeholders. Document changes and communicate updates to all users.

6. Implementation and Follow-Up:
   Integrate the revised processes into workflows. Schedule periodic reviews to maintain relevance and accuracy.

Benefits:

The process documentation review involves six key steps to ensure thorough evaluation and improvement. First, preparation entails identifying the scope and purpose of the review while gathering relevant documents, such as standard operating procedures, workflows, and guidelines. Next, the evaluation phase assesses the clarity, structure, and alignment of the documentation with organisational goals and industry standards, ensuring that updates reflect current practices and regulatory compliance. In the feedback collection stage, stakeholders, including process owners and users, are engaged to identify gaps, redundancies, or ambiguities in the documentation. Following this, recommendations are made, offering actionable suggestions to enhance efficiency and clarity, with revisions prioritized based on urgency and impact. The validation step ensures that updates are tested and approved by relevant stakeholders, with all changes documented and communicated to users. Finally, during implementation and follow-up, the revised processes are integrated into workflows, and periodic reviews are scheduled to maintain their relevance and accuracy. This structured approach ensures continuous improvement and alignment with organisational objectives.

6. Approval Process

Method: Approval Process

Target Group: Schools and Parents

Description:

The approval process method focuses on obtaining explicit consent and approvals from schools and parents to ensure that all data collection, processing, and usage comply with legal and ethical standards, such as the General Data Protection Regulation (GDPR). This process establishes legitimacy and trust by ensuring transparency and safeguarding sensitive information, particularly when working with vulnerable populations like children and students with special needs. Approval procedures involve obtaining written consent from parents and institutional permissions from schools, detailing the scope, purpose, and handling of the data. The method ensures that stakeholders are fully informed about how the data will be used and provides mechanisms for them to withdraw consent if needed (Vayena et al., 2018).

Relevance in Research:

- Regulatory Adherence: Adhering to GDPR and similar regulations minimises the risk of legal or ethical violations, ensuring that the project operates within established legal frameworks. This builds trust among stakeholders, particularly parents and schools, who need assurance that their rights and the rights of their children are protected.
- Ethical Accountability: The approval process ensures that research is conducted ethically, prioritising the rights and well-being of participants. It provides a mechanism for accountability, ensuring that researchers respect the autonomy and privacy of individuals involved.
- Data Integrity: By establishing clear guidelines for data handling and storage, this method ensures that sensitive information is managed responsibly, reducing the risk of breaches or misuse (Creswell & Poth, 2018). Proper approvals provide a foundation for secure and reliable data collection, contributing to the credibility of the research findings.

7. Think-Aloud Protocol

Target Group: Teachers, Parents, and Guardians

Description:

The think-aloud protocol is a qualitative research method that captures users' cognitive processes as they interact with digital tools. Participants are asked to verbalise their thoughts, feelings, and decisions while performing specific tasks, providing researchers with direct insights into their experiences (Ericsson & Simon, 1993). This method is particularly effective in identifying usability issues, such as design flaws, confusing interfaces, or inefficient workflows, that might otherwise go unnoticed in observational or survey-based approaches. The think-aloud protocol emphasizes real-time feedback, allowing researchers to explore how users navigate digital tools and where they encounter challenges (Nielsen, 1994).

Relevance in Research:

- Cognitive Approach: By encouraging participants to articulate their thoughts, the think-aloud protocol provides a window into their mental models and decision-making processes. This aligns with Ericsson and Simon's (1993) theory that verbalised thoughts are a direct reflection of cognitive activity, offering valuable insights into how users understand and engage with digital interfaces.

- Identifying Usability Issues: This method helps uncover specific usability problems, such as unclear navigation, overly complex instructions, or features that do not align with user expectations. According to Nielsen (1994), the think-aloud protocol is one of the most effective techniques for improving user-centred design, as it pinpoints bottlenecks that hinder effective tool usage.

- User-Centred Design Improvements: Feedback collected through the think-aloud protocol allows designers and developers to refine digital tools based on actual user experiences. The iterative nature of this method ensures that improvements are grounded in real-world data, enhancing both functionality and accessibility.

Practical Use:

The think-aloud protocol involves several key steps to ensure effective implementation:

1. Task Selection: Researchers design specific tasks that reflect common or critical user interactions with the digital tool. Tasks are selected to cover a range of features and functionalities.

2. Participant Recruitment: Teachers, parents, and guardians are invited to participate, ensuring a diverse range of perspectives.

3. Session Execution: During sessions, participants are asked to complete the tasks while verbalising their thoughts. Audio recordings are used to capture their comments, pauses, and any difficulties they encounter. Researchers observe but do not intervene, ensuring the process remains natural and authentic.

4. <u>Data Analysis</u>: Researchers transcribe and analyse the recordings, focusing on patterns of confusion, frustration, or satisfaction. These insights are used to generate recommendations for design improvements.

5. <u>Iterative Testing</u>: Updated versions of the digital tools are re-evaluated using the same protocol to confirm that identified issues have been resolved.

Benefits:

Direct User Feedback: The method provides immediate and actionable insights into user experiences, enabling rapid identification and resolution of design flaws.

Contextual Insights: Unlike surveys or interviews, the think-aloud protocol captures real-time interactions, offering a richer understanding of user behaviour and context.

Accessibility Testing: This approach is particularly valuable for evaluating tools designed for diverse user groups, including those with varying levels of digital literacy or accessibility needs.

Limitations:

While the think-aloud protocol is highly effective, it has some limitations. Participants may feel self-conscious or struggle to articulate their thoughts, potentially influencing their natural behaviour (Boren & Ramey, 2000). Additionally, the method requires skilled facilitators to guide sessions without introducing bias or distractions.

Conclusion:

The think-aloud protocol is a powerful method for evaluating the usability of digital tools, providing researchers with direct insights into users' cognitive processes and challenges. By systematically identifying and addressing usability issues, this approach ensures that digital tools are intuitive, effective, and user-centred. Grounded in foundational research by Ericsson and Simon (1993) and Nielsen (1994), the think-aloud protocol remains a cornerstone of user experience evaluation, particularly in educational technology design.

Summary of Current Procedures, Evaluation Areas and Next Steps

Procedures

Digital Material Upload:

- Ensure all relevant materials are uploaded to IZZI and that access links are provided.

GDPR Compliance:

- Secure GDPR approvals from schools and parents before piloting digital tools.
- Ensure all data is collected, stored, and processed following GDPR regulations.

Approval Forms:

- Obtain necessary consent from school authorities and parents.
- Draft standardized consent forms for school leaders and parental approval.

Evaluation Areas

- Material Quality: Are the digital tools and materials of high quality, engaging, and useful for the target audience?
- Procedural Efficiency: How well are the digital tools integrated into everyday school procedures? Are the processes clear and streamlined for users?
- Impact on Learning: Have the digital tools positively influenced students' learning and parents' engagement in the educational process?
- Technical Performance: How well do the digital tools (e.g., IZZI, Smartboards) function in real-world school environments? Are there technical obstacles?

Timeline and Deliverables

- Joint evaluation meeting in late 2025
- Present findings from initial assessments and observations

Ongoing Monitoring: Continue observation visits, interviews, and questionnaire distribution in participating schools (e.g., Germany, Croatia, Bulgaria, if possible, Norway, if possible).

Draft Evaluation Summary:

After gathering data, prepare a one-page summary for review by the project team, ensuring all necessary areas are covered.

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