SMEs – Raising Awareness and Learning on Digital data, data analysis and artificial intelligence

The

Assessment Repository

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The SMERALD assessment repository

A Guide for Trainers, Teachers, and Educators

Developed under the SMERALD Project (Erasmus+ 2023–2025)

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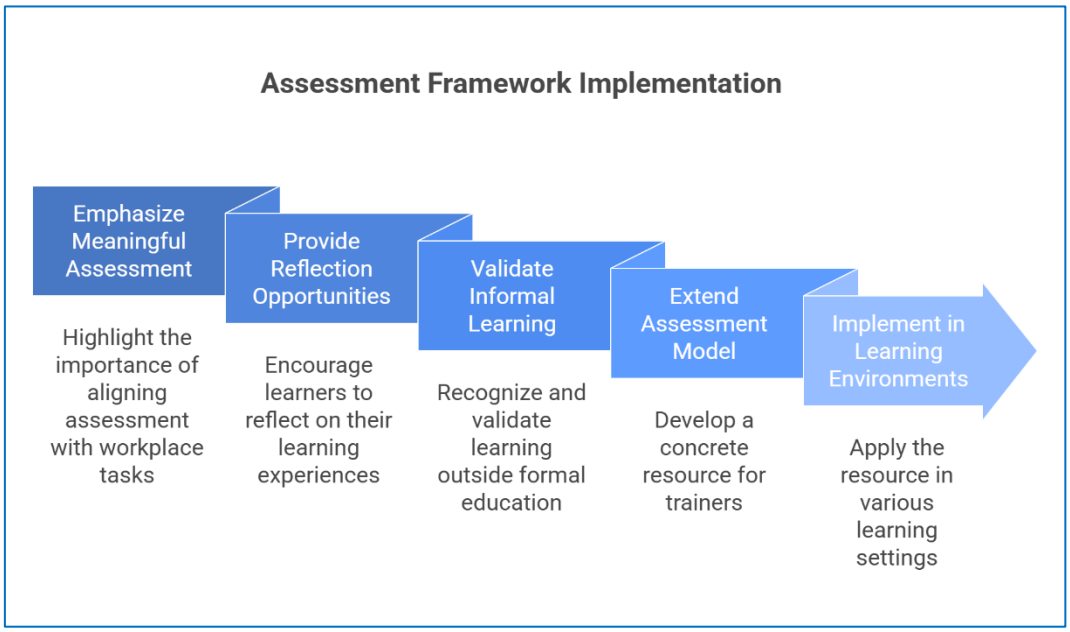
I. Introduction to the Assessment Repository

This document provides a comprehensive and practice-oriented collection of assessment methods designed to fully support the SMERALD competence-oriented learning approach. Rooted in the SMERALD Competence Framework, it builds upon the foundational principles outlined on pages 19–24: that competence development must reflect authentic practice, integrate cognitive, practical, and attitudinal dimensions, and be validated through rich, context-specific evidence rather than traditional testing alone.

The Framework emphasises that meaningful assessment requires deliberate alignment with real workplace tasks, opportunities for reflection, and validation mechanisms that acknowledge informal and non-formal learning. Following these principles, this repository extends the original conceptual assessment model into a concrete, trainer-friendly resource that VET professionals, SME facilitators, and instructors can implement directly in blended, online, or face-to-face learning environments.



By providing detailed, structured assessment methods, this document reinforces the SMERALD belief that assessment is not an endpoint, but an integral part of learning—supporting orientation, guiding development, ensuring quality, and making competence growth visible across AI, Data Analysis, and Digital Data contexts.

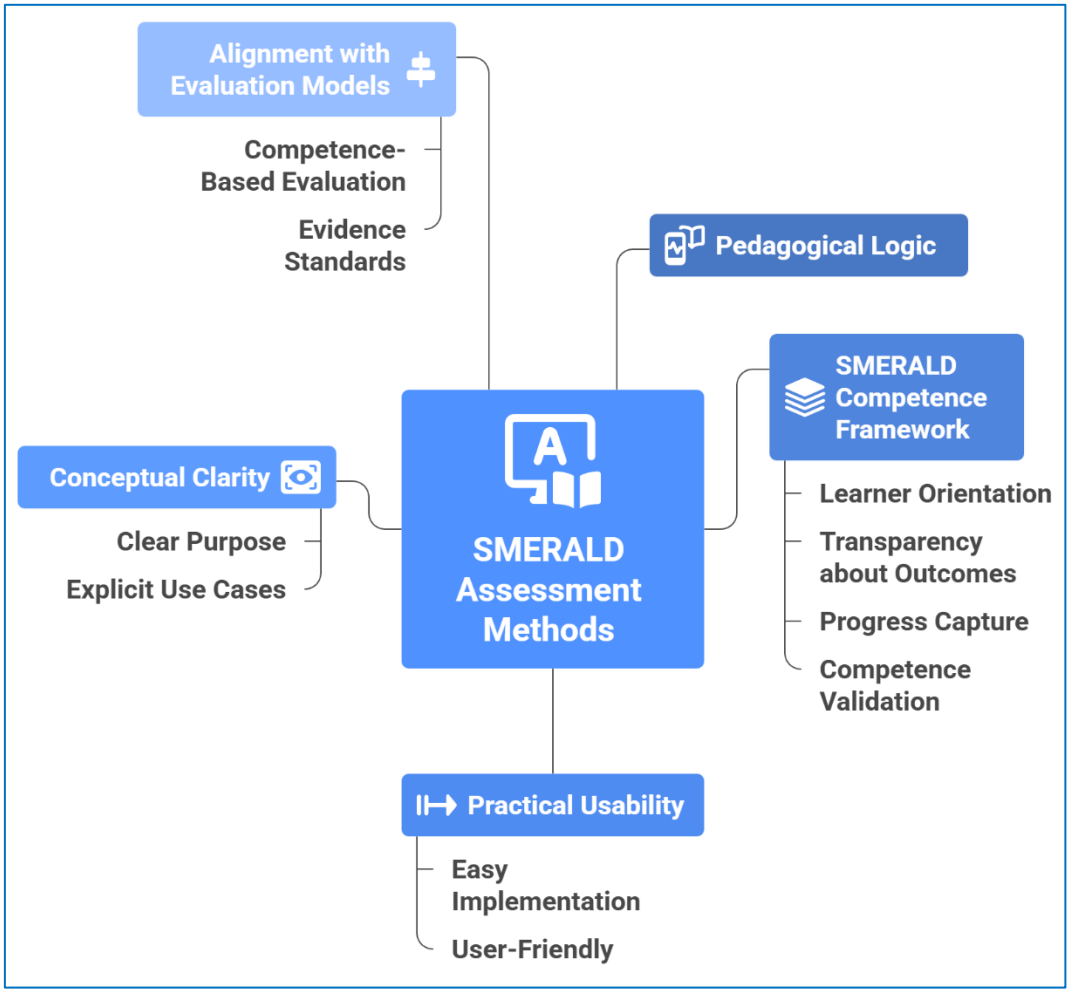
Each assessment method will be represented as an individual Canva-ready page to support modular use in workshops, courses, and blended learning environments.

Structure of Each Assessment Method

The structure below is not merely a formatting choice—it reflects the pedagogical logic of the SMERALD approach and ensures consistency with all other SMERALD learning and assessment documents. Each element serves a specific function within competence-oriented learning and makes the assessment methods adaptable across different SME and VET contexts.

This structure also reflects the principles outlined in the SMERALD Competence Framework, where assessment is described as a multi-layered process that:

- supports learner orientation,
- creates transparency about expected outcomes,
- enables trainers to capture progress in real and relevant contexts,
- and connects learning activities directly with competence validation.



The six-part structure is therefore designed to balance **practical usability**, **conceptual clarity**, and **alignment with competence-based evaluation models** such as LEVEL5. It ensures that each method is explained in a way that makes its purpose, use cases, and evidence standards explicit.

Specifically:

- **The Method Description** clarifies the assessment's value and links it to competence dimensions.
- **Instructions** provide clear steps that trainers can follow without requiring additional resources.
- **Application in AI, Data Analysis & Digital Data** ensures transferability to all SMERALD competence areas.
- **Examples** translate theory into practice, showing exactly how a method works in a real SME or VET context.
- **Advantages and Disadvantages** allow trainers to make informed choices about when to use a method and how to combine it with others.

This structural approach guarantees coherence, supports blended learning scenarios, and ensures that the assessment methods can be integrated smoothly into the SMERALD learning pathways, CPD formats, and future project-based training offers.

Each method follows this structure:

1. **Method Description** – What the method evaluates and why it matters.
2. **Instructions** – Facilitation guidance for trainers.
3. **Application in AI, Data Analysis & Digital Data** – How the method fits SMERALD.
4. **Example** – Concrete practical scenario.
5. **Advantages** – Strengths and benefits.
6. **Disadvantages** – Limitations or considerations.

List of Assessment Methods

1. SPIDER Questionnaire
2. LEVEL5 Rubric Assessment
3. LEVEL5 Learning Journal
4. Guided Observation
5. Micro-Scenario Testing
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7. Mini-Portfolio
8. Prompt Debugging Task
9. Workflow Mapping Exercise
10. Concept Mapping
11. Digital Artefact Creation
12. Case-Based Discussion
13. Rapid Prototyping Task
14. Role-Play Simulation
15. SME-Context Simulation
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Assessment Method 1: SPIDER Questionnaire

1. Method Description
The SPIDER Questionnaire is a structured self-assessment tool used to capture a learner's perceived competence across three dimensions—Knowledge, Skills, and Attitudes. It supports learners in identifying their starting point before engaging in training on AI, Data Analysis, or Digital Data. The visual SPIDER diagram allows participants to recognise strengths, gaps, and priority areas for development. As a formative assessment, it encourages metacognition and sets the foundation for personalised learning pathways.

2. Instructions	
	1. Provide the questionnaire digitally or as a printed worksheet. 2. Ask participants to rate themselves across the given competence indicators using the numerical scale. 3. Invite a short-written reflection (2–4 sentences) about why they chose specific ratings. 4. Collect the results (anonymised optional). 5. Use the SPIDER visualisation to discuss learning goals. 6. Repeat at the end of the training to compare progress.

3. Application in AI, Data Analysis & Digital Data	
	AI: Identifies the learner's prior awareness of AI concepts, comfort level with tools, and openness to experimentation.
	**Data Analysis:** Reveals confidence in interpreting datasets, understanding basic analysis techniques, and using analytical tools.
	**Digital Data:** Helps measure understanding of data structures, quality criteria, and digital workflows.

4. Example
During the SMERALD piloting, a participant rated themselves highly in AI tool usage but low in theoretical understanding of algorithms. This insight led them to begin with foundational modules before engaging in practical workshops. At the end of the training, the SPIDER showed clear improvement in Skills and Attitudes, especially regarding confidence and willingness to integrate AI into daily tasks.

5a. Advantages	5b. Disadvantages
• Easy to implement and low preparation. • Encourages meaningful self-reflection. • Supports personalised learning plans. • Allows clear before/after comparison. • Suitable for all SME and VET contexts.	• Subjective; relies on learners' self-perception. • Risk of over- or underestimation without facilitation. • Works best when combined with other validation methods such as LEVEL5.

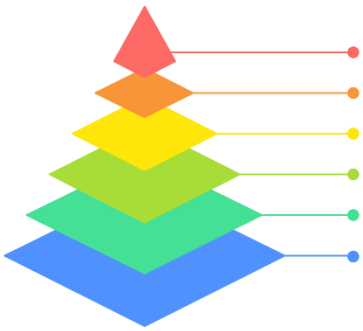
Assessment Method 2: LEVEL5 Rubric Assessment

1. Method Description

The LEVEL5 Rubric Assessment is a structured validation method grounded in the LEVEL5 competence development model. It assesses learner performance along three dimensions—Knowledge, Skills, and Attitudes—using a five-level taxonomy ranging from initial awareness to proficient application in real-world contexts.

The method provides a clear, transparent, and evidence-based way to document competence growth. By evaluating observable behaviours, applied tasks, and reflective insights, the LEVEL5 rubric transforms informal and non-formal learning outcomes into validated, recognisable achievements. This makes it particularly suited for SMERALD's focus on practical AI, Data Analysis, and Digital Data competences.

2. Instructions



1. Introduce the LEVEL5 model and explain the five-level taxonomy.
2. Provide learners with the rubric criteria for Knowledge, Skills, and Attitudes.
3. Ask learners to provide evidence of their competence (artefacts, descriptions, screenshots, workflows, etc.).
4. Evaluate performance using the rubric, supported by concrete examples of behaviour and task completion.
5. Discuss results in a feedback conversation to ensure transparency and alignment.
6. Optionally: Repeat the evaluation after a learning cycle to validate progress.

3. Application in AI, Data Analysis & Digital Data

	AI: Assessing how learners understand and apply prompting, tool selection, workflow integration, and critical evaluation of AI outputs.
	Data Analysis: Measuring competence in interpreting datasets, applying analytical methods, and ensuring data quality.
	Digital Data: Evaluating understanding of formats, structures, metadata, personal data considerations, and data-driven decision-making.

4. Example

In a SMERALD workshop, a participant created an AI-supported workflow for producing video scripts. They provided:

- screenshots of the prompting process,
- a comparison between manual and AI-assisted versions,
- a written reflection on quality differences.

The assessor used the LEVEL5 rubric to validate that the participant reached:

- Level 3 in Knowledge (understanding workflow concepts),
- Level 4 in Skills (applying AI tools effectively),
- Level 3 in Attitude (confidence with supervision).

5a. Advantages	5b. Disadvantages
• In a SMERALD workshop, a participant created an AI-supported workflow for producing video scripts. They provided: • screenshots of the prompting process, • a comparison between manual and AI-assisted versions, • a written reflection on quality differences. • The assessor used the LEVEL5 rubric to validate that the participant reached: • Level 3 in Knowledge (understanding workflow concepts), • Level 4 in Skills (applying AI tools effectively), • Level 3 in Attitude (confidence with supervision).	• Requires facilitation and time for evidence review. • Learners may need guidance to select meaningful artefacts. • Works best when combined with reflective tools (e.g., SPIDER or Learning Journal).

Assessment Method 3: LEVEL5 Learning Journal

1. Method Description

The LEVEL5 Learning Journal is a structured reflection tool designed to document learning processes, emotional responses, challenges, and competence development over time. Unlike the rubric, which validates final performance, the Learning Journal focuses on **learning as a dynamic process**, capturing how learners form understanding, apply new skills, and adjust attitudes toward AI, Data Analysis, and Digital Data.

This method is particularly valuable within the SMERALD approach because it supports **metacognition**, fosters self-awareness, and provides rich qualitative evidence for competence growth—aligned with the LEVEL5 model's emphasis on contextualised and experiential learning.

2. Instructions

1. Provide learners with a structured journal template (daily, session-based, or weekly entries).
2. Guide them to reflect on:
   a) What they learned
   b) What they applied
   c) What challenges occurred
   d) How their confidence or attitudes shifted
   e) What they want to try next
3. Encourage learners to attach artefacts (screenshots, notes, prompts, sketches, workflow drafts).
4. Review journal entries periodically (midpoint + end), offering short feedback.
5. Use journal reflections as supporting evidence during LEVEL5 validation.

3. Application in AI, Data Analysis & Digital Data

	AI: Learners can reflect on prompting successes/failures, tool comparisons, and decisions for improving outputs.
	Data Analysis: Journals help document the logic behind analytical decisions, interpretation challenges, or dataset issues.
	Digital Data: Supports reflection on data quality, data structuring processes, and insights into digital workflows.

4. Example

During the SMERALD piloting, participants kept a short daily journal documenting experimentation with AI tools. One learner noted initial frustration with inconsistent outputs, then described how adjusting prompts improved results. Their journal documented:

- The decision-making process
- Emotional shifts (from scepticism to curiosity)
- Practical examples of improved performance

This journal served as strong evidence for LEVEL5 Skill and Attitude development.

5a. Advantages	5b. Disadvantages
• During the SMERALD piloting, participants kept a short daily journal documenting experimentation with AI tools. One learner noted initial frustration with inconsistent outputs, then described how adjusting prompts improved results. Their journal documented: • The decision-making process • Emotional shifts (from scepticism to curiosity) • Practical examples of improved performance • This journal served as strong evidence for LEVEL5 Skill and Attitude development.	• Requires time and consistent learner engagement. • Journals may be superficial without guidance. • Reviewing detailed entries can be time-consuming for trainers.

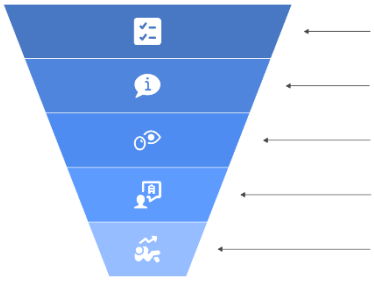
Assessment Method 4: Guided Observation

1. Method Description

Guided Observation is an assessment method where a trainer, facilitator, or peer systematically observes a learner's behaviour while performing a real or simulated task. It focuses on capturing **observable indicators of competence**, such as tool usage, decision-making, collaboration, and problem-solving.

Within the SMERALD approach, Guided Observation is particularly valuable because AI, Data Analysis, and Digital Data competencies often manifest through **action**: how a learner applies tools, interacts with data, responds to errors, and integrates new methods into workflows. This method makes these practical dimensions visible and assessable.

2. Instructions



1. Define the task to be observed (e.g., creating an AI-assisted draft, cleaning a dataset, mapping a workflow).
2. Prepare observation criteria aligned with Knowledge, Skills, and Attitudes.
3. Inform learners about the observation process to ensure transparency.
4. Observe the learner during a real or simulated activity, taking structured notes.
5. Provide direct feedback immediately after the observation.
6. Optionally: repeat the observation later to track progress.

3. Application in AI, Data Analysis & Digital Data

	AI: Observing how learners select tools, refine prompts, evaluate outputs, and iterate.
	Data Analysis: Assessing the approach to data cleaning, interpretation, logical reasoning, and tool navigation.
	Digital Data: Observing understanding of data quality criteria, structuring procedures, and secure digital behaviour.

4. Example

During the SMERALD piloting, a participant worked on improving a video script using an AI tool. The facilitator observed:

- how the participant reformulated prompts,
- how they compared AI vs. non-AI versions,
- their reasoning behind selecting the final draft,
- how they responded to unexpected tool behaviour.

The observation revealed strong iterative thinking (Skills) but limited understanding of why certain AI outputs behaved inconsistently (Knowledge). This informed the learner's next training steps.

5a. Advantages	5b. Disadvantages
• Captures competence-in-action, not just theory. • Provides immediate, personalised feedback. • Useful for validating practical workflows and behaviour. • Can be adapted to individual or group activities. • Aligns strongly with real SME learning contexts.	• Requires trained observers to avoid bias. • Time-intensive if many learners must be observed. • Learners may behave differently under observation. • Observation notes must be structured to maintain reliability.

Assessment Method 5: Micro-Scenario Testing

1. Method Description

Micro-Scenario Testing is a short, focused assessment method in which learners respond to a realistic, SME-relevant scenario involving AI, Data Analysis, or Digital Data. The scenario presents a small challenge or decision-making moment designed to test how learners think, react, and apply their competences in context.

Unlike large case studies, micro-scenarios are intentionally compact. They assess the learner's practical reasoning, problem-solving, ethical awareness, and ability to transfer learning into real or simulated workplace situations. This aligns directly with SMERALD's commitment to context-based competence development.

2. Instructions

1. Prepare a short scenario (3–6 sentences) describing a realistic SME problem.
2. Present the scenario to the learner individually or in a group.
3. Ask the learner to explain how they would approach the situation, select tools, or solve the issue.
4. Evaluate their response using criteria aligned with Knowledge, Skills, and Attitudes.
5. Facilitate a short discussion about alternative approaches.
6. Optionally: repeat with different scenarios to track progression.

3. Application in AI, Data Analysis & Digital Data

	AI: Scenarios may ask learners how to handle AI-generated errors, choose tools, adapt prompts, or manage ethical concerns.
	Data Analysis: Scenarios may involve interpreting misleading data, deciding how to clean datasets, or selecting analysis methods.
	Digital Data: Scenarios may address data quality issues, privacy concerns, metadata organisation, or data-driven decisions.

4. Example

Scenario: "A client provides you with unstructured notes and asks for a clear project overview. They need it fast. How would you use AI tools to turn this into a structured summary?"

- A learner responds by:
- selecting an appropriate AI tool,
- preparing prompts based on the notes,
- evaluating output quality,
- making manual adjustments,
- and reflecting on potential data privacy considerations.

This reveals competence in tool selection, workflow planning, and ethical awareness.

5a. Advantages	5b. Disadvantages
• Fast to implement and highly flexible. • Strongly connected to real SME challenges. • Allows assessment of reasoning, decision-making, and context transfer. • Useful for formative assessment and discussion.	• Scenarios must be well-designed for reliability. • Responses can be subjective without clear criteria. • Does not directly measure hands-on tool proficiency. • May disadvantage learners who are less confident in verbal explanation.

Assessment Method 6: Peer Review / Peer Feedback

1. Method Description

Peer Review is an interactive assessment method in which learners evaluate each other's work, processes, or outputs using structured criteria. The goal is not only to assess quality, but to stimulate collaboration, critical thinking, constructive communication, and reflective learning.

Within the SMERALD context, Peer Review supports competence development by allowing learners to experience different approaches to AI, Data Analysis, and Digital Data tasks. By reviewing others' work, learners deepen their understanding, identify alternative strategies, and become more aware of their own learning processes.

2. Instructions

1. Provide learners with clear evaluation criteria (Knowledge, Skills, Attitudes).
2. Assign each learner a partner or small review group.
3. Learners exchange artefacts (AI outputs, datasets, visuals, workflows, reflections).
4. Reviewers provide structured feedback using a template (strengths, areas for improvement, questions).
5. Facilitate a short discussion between reviewer and author for clarification.
6. Optionally: learners revise their work based on feedback.

3. Application in AI, Data Analysis & Digital Data

	AI: Reviewing prompt structures, evaluating AI-generated text or images, comparing workflow logic.
	Data Analysis: Reviewing visualisations, interpretation notes, cleanliness of datasets, or analytical decisions.
	Digital Data: Assessing data organisation, documentation, metadata quality, and process reliability.

4. Example

In a SMERALD session, learners created AI-assisted concept drafts. They exchanged drafts and provided feedback on:

- clarity and accuracy of prompt formulation,
- quality and reliability of generated output,
- ethical considerations (e.g., use of images or text),
- reflection on improvement potential.

A participant noted that peer input helped them understand how small prompt adjustments could dramatically change output quality.

5a. Advantages	5b. Disadvantages
• Strengthens learning through collaboration. • Encourages critical thinking and constructive communication. • Provides multiple perspectives on a single task. • Helps learners self-identify areas for improvement. • Low-threshold and highly flexible.	• Requires training on how to give constructive feedback. • Peer judgement may be inconsistent without clear criteria. • Some learners may feel uncomfortable evaluating peers. • Works best when combined with facilitator moderation.

Assessment Method 7: Mini-Portfolio

1. Method Description

The Mini-Portfolio is a compact, evidence-based assessment method in which learners collect and present a curated selection of artefacts demonstrating their competence development. Unlike a full portfolio, the Mini-Portfolio focuses on **quality over quantity**, highlighting the learner's most relevant outputs, reflections, and practical examples from AI, Data Analysis, or Digital Data tasks.

This method aligns strongly with the SMERALD competence-oriented approach because it captures **authentic performance**, showing how learners apply new tools and concepts in real or simulated SME contexts. The Mini-Portfolio also allows learners to demonstrate growth across Knowledge, Skills, and Attitudes, making it a powerful validation method.

2. Instructions

1. Provide learners with clear guidelines on portfolio structure (e.g., 3–5 artefacts).
2. Ask learners to select meaningful outputs such as:
   a) AI-generated texts or visuals,
   b) cleaned datasets or analysis workflows,
   c) screenshots of tool interactions,
   d) workflow diagrams,
   e) short written reflections.
3. Encourage learners to attach a brief rationale for each artefact:
   a) What is it?
   b) Why did I select it?
   c) What competence does it demonstrate?
4. Review the Mini-Portfolio using a rubric aligned with the SMERALD competence dimensions.
5. Provide written or verbal feedback to support further development.

3. Application in AI, Data Analysis & Digital Data

	AI: Documenting prompts, outputs, iterations, ethical considerations, and workflow decisions.
	Data Analysis: Including screenshots of data cleaning steps, visualisations, interpretation notes, and explanation of analytical reasoning.
	Digital Data: Capturing examples of data structuring, metadata decisions, secure data handling, or documentation quality.

4. Example

During a SMERALD training cycle, a learner compiled a Mini-Portfolio containing:

- a draft generated with an LLM and their manual revision,
- a visualisation created from a small dataset,
- a reflection describing challenges with data quality,

• a workflow sketch integrating AI into a daily task. The selection clearly demonstrated competence progression and showed how the learner integrated new tools into practical work routines.

5a. Advantages	5b. Disadvantages
• Captures real, authentic evidence of competence. • Encourages reflection and ownership of learning. • Flexible and adaptable to all SMERALD topics. • Provides strong material for LEVEL5 validation. • Useful for both formative and summative assessment.	• Requires guidance to ensure artefacts are meaningful. • Can be time-consuming for learners to curate. • Assessment can become subjective without a strong rubric. • Quality varies depending on learner motivation and documentation habits.

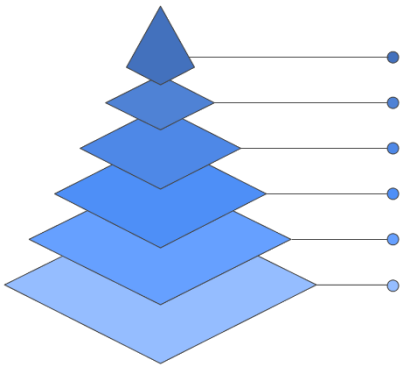
Assessment Method 8: Prompt Debugging Task

1. Method Description

The Prompt Debugging Task is a targeted assessment method that evaluates how well learners understand the logic of prompting, error correction, and iterative refinement when working with AI tools. Rather than focusing only on generating outputs, this method assesses the learner's ability to diagnose problems, recognise why an output failed or is inaccurate, and take strategic steps to improve it.

This method is deeply aligned with the SMERALD approach, as competence in AI is not merely about using tools but understanding how to guide them effectively. Prompt debugging reveals cognitive processes, practical decision-making, and the learner's ability to critically evaluate AI-generated results.

2. Instructions



1. Provide learners with an intentionally flawed or suboptimal prompt OR ask them to create one themselves.
2. Ask learners to identify what is wrong or unclear within the prompt.
3. Instruct the learner to produce an improved version of the prompt.
4. Ask them to run both prompts through an AI tool to compare outputs.
5. Request a short written explanation of why the new prompt works better.
6. Evaluate their debugging process using Knowledge, Skills, and Attitudes criteria.

3. Application in AI, Data Analysis & Digital Data

	AI: Assesses understanding of prompt structure, clarity, context specificity, and iterative refinement.
	Data Analysis: Can be used to debug analytical prompts in AI-powered analysis tools, ensuring learners understand how differently phrased instructions produce different interpretations.
	Digital Data: Helps learners reflect on accuracy, completeness, metadata clarity, and data description quality.

4. Example

A learner receives the following flawed prompt: "Write something about data."
They identify issues:

- no context,
- no target audience,
- no output format,
- no purpose.

The learner reformulates the prompt as: “Write a 150-word introduction for SME managers explaining why data quality is essential for making reliable business decisions.” Running both prompts through an AI tool reveals drastic output differences. The learner then explains why the improved prompt provides context, purpose, and structure.	
5a. Advantages	**5b. Disadvantages**
• Highly practical and directly linked to real AI usage. • Encourages analytical and critical thinking. • Shows both process and outcome. • Easy to integrate into short training sessions. • Works well for both beginners and advanced learners.	• Requires access to an AI tool for comparison. • Learners may struggle without prior knowledge of prompting. • Evaluation can become subjective if criteria are unclear. • Less suitable for individuals unfamiliar with iterative workflows.

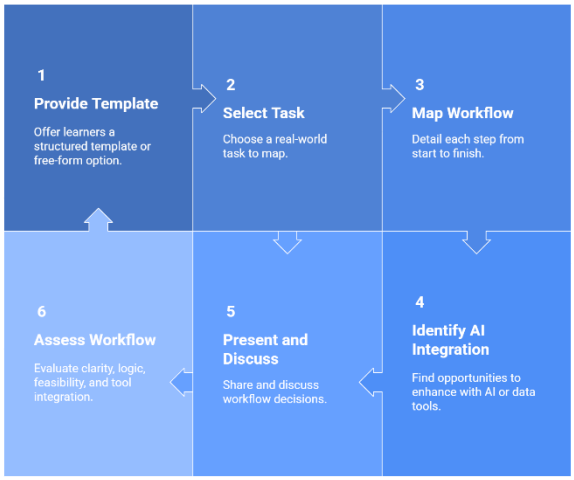
Assessment Method 9: Workflow Mapping Exercise

1. Method Description

The Workflow Mapping Exercise is an assessment method that evaluates a learner's ability to understand, visualise, and improve work processes involving AI, Data Analysis, or Digital Data. Learners create a structured map of a workflow—either from their own professional context or from a provided case—and identify where digital tools can support, optimise, or transform tasks.

This method reflects the SMERALD competence philosophy by combining analytical thinking, systems understanding, and practical application. It helps trainers assess not only what learners know, but how they translate that knowledge into process improvements, making it especially relevant for SMEs seeking efficiency through AI or data-driven methods.

2. Instructions



1. Provide learners with a workflow template or allow free-form mapping.
2. Ask them to select a real task (e.g., preparing reports, analysing data, creating communication material).
3. Instruct them to map each step of the workflow from start to finish.
4. Ask learners to identify points where AI or data tools could support or improve the process.
5. Facilitate a short presentation or discussion where learners explain their decisions.
6. Assess the workflow based on clarity, logic, feasibility, and integration of digital tools.

3. Application in AI, Data Analysis & Digital Data

	AI: Identifying where AI can automate routine steps, generate drafts, or support decision-making.
	Data Analysis: Understanding where data is collected, processed, cleaned, interpreted, or visualised.
	Digital Data: Highlighting data flows, documentation, metadata needs, and secure storage practices.

4. Example

In a SMERALD training day, a participant mapped a workflow for creating a video script. Their map included:

- collecting raw ideas,
- drafting manually,

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testing an LLM-generated version,
refining outputs,
preparing the final script.

They marked several improvement points using AI to speed up ideation and improve clarity. This demonstrated strong systems thinking and understanding of AI’s supportive role.
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<tr><th>5a. Advantages</th><th>5b. Disadvantages</th></tr>
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Makes complex processes visible and concrete.
Encourages strategic thinking and process optimisation.
Supports integration of AI and data tools into daily SME workflows.
Useful for team-based or individual assessment.
Works well in blended learning environments.

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Requires time to map detailed workflows.
Learners may struggle without process-mapping experience.
Interpretation can be subjective without clear criteria.
Maps vary greatly in quality depending on learner confidence and visual skill.

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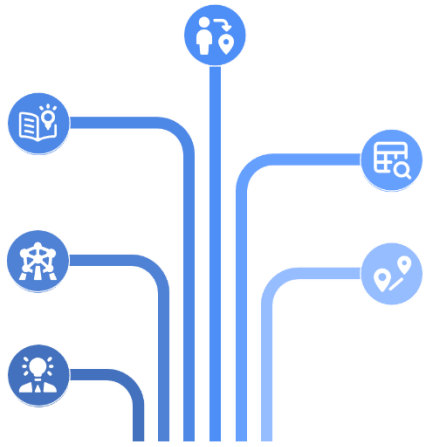
Assessment Method 10: Concept Mapping

1. Method Description

Concept Mapping is a visual assessment method that evaluates how learners understand and structure relationships between key ideas, tools, concepts, and processes. By creating a concept map, learners demonstrate not only what they know but how they connect knowledge, which is essential for mastering AI, Data Analysis, and Digital Data in a holistic and competence-oriented way.

This method fits the SMERALD approach because it identifies cognitive depth, reveals misconceptions, and highlights gaps in understanding. Concept maps are particularly effective in blended or introductory sessions to make learner thinking visible and to support further learning planning.

2. Instructions



1. Provide learners with a central topic (e.g., "AI workflow", "Data quality", "Digital data processes").
2. Ask learners to create a concept map showing relevant ideas, tools, and relationships.
3. Encourage them to include:
   a) definitions,
   b) examples,
   c) connections,
   d) causes/effects,
   e) dependencies.
4. Learners present their map or exchange with peers.
5. Assess the map based on clarity, accuracy, completeness, and the logic of relationships.
6. Optionally: compare maps created at the start and end of training to visualise growth.

3. Application in AI, Data Analysis & Digital Data

	AI: Mapping connections between prompting, models, outputs, ethics, workflows, and tool selection.
	Data Analysis: Showing relationships between data collection, cleaning, interpretation techniques, and visualisation.
	Digital Data: Visualising data flows, structures, file types, metadata, and storage or documentation needs.

4. Example

In a SMERALD introductory workshop, participants created concept maps on "The role of AI in SME workflows."
One learner connected:

- AI draft generation

- Data cleaning needs
- Ethical considerations
- Workflow automation
- Quality assurance steps

The map revealed clear understanding of dependencies and helped the trainer identify which areas required deeper exploration.

5a. Advantages	5b. Disadvantages
• Makes learner thinking visible and explicit. • Identifies misconceptions early. • Supports knowledge structuring and deeper understanding. • Useful for both formative and summative assessment. • Easy to compare over time.	• Some learners may feel uncomfortable with visual tasks. • Quality varies depending on visual or organisational skills. • Maps can become messy without clear instructions. • Assessment may be subjective without a rubric.

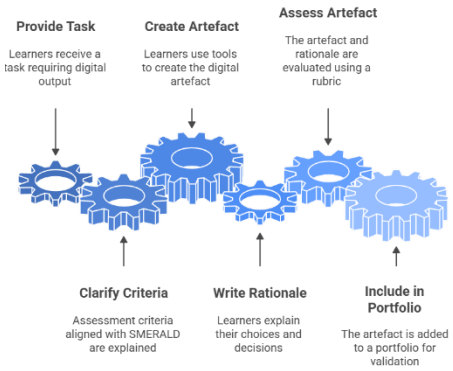
Assessment Method 11: Digital Artefact Creation

1. Method Description

Digital Artefact Creation is an assessment method in which learners produce a concrete, digital output that demonstrates their applied competence in AI, Data Analysis, or Digital Data. Artefacts may include AI-generated texts, images, short videos, dashboards, cleaned datasets, visualisations, workflow diagrams, or combined multimedia elements.

This method aligns strongly with the SMERALD approach because it captures applied performance, showing how learners use tools to solve real or simulated SME challenges. The artefact itself becomes rich evidence for competence across Knowledge, Skills, and Attitudes, particularly when combined with a short rationale or reflection.

2. Instructions



1. Provide learners with a task requiring a digital output (e.g., create an AI-assisted draft, visualise a dataset, document a digital workflow).
2. Clarify assessment criteria aligned with the SMERALD competence dimensions.
3. Ask learners to create the artefact using the tools covered in training.
4. Request a short rationale explaining:
   a) what was done,
   b) why specific tools or prompts were chosen,
   c) how decisions were made,
   d) what worked well and what didn't.
5. Assess the artefact and rationale using a rubric.
6. Optionally: include the artefact in a Mini-Portfolio or LEVEL5 validation.

3. Application in AI, Data Analysis & Digital Data

	AI: Generating texts, images, video concepts, scripts, or prototypes using LLMs, image generators, or automation tools.
	Data Analysis: Creating visualisations, dashboards, cleaned datasets, summaries, or analytical reports.
	Digital Data: Documenting data structures, metadata descriptions, quality checks, storage concepts, or workflow diagrams.

4. Example

During the SMERALD piloting, a participant created an AI-generated first draft of a communication text, then refined it manually.
They submitted:

- the initial prompt,
- the generated output,
- a revised final version,
- and a rationale describing why they changed certain elements.

This artefact clearly demonstrated competence in prompting, critical evaluation, and applying AI outputs in a professional context.	
5a. Advantages	**5b. Disadvantages**
• Produces concrete, assessable evidence. • Highly adaptable to SME contexts and training topics. • Encourages creativity, tool exploration, and problem-solving. • Ideal for blended and practical learning environments. • Integrates naturally into LEVEL5 validation or Mini-Portfolios.	• Requires access to digital tools and software. • Quality depends on learner confidence with technology. • Some artefacts may be difficult to compare without a strong rubric. • Facilitation time needed for reviewing complex artefacts.

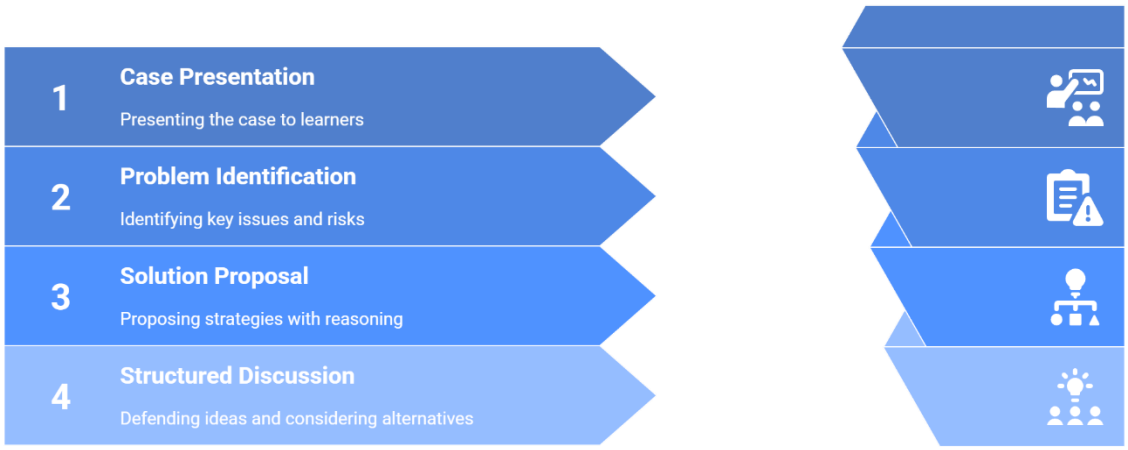
Assessment Method 12: Case-Based Discussion

1. Method Description

Case-Based Discussion (CBD) is an assessment method in which learners analyse and discuss a realistic, detailed case that represents a typical problem or decision-making scenario in an SME context. The focus lies on evaluating reasoning, decision-making, ethical awareness, and the integration of AI, Data Analysis, or Digital Data competences.

This method aligns with the SMERALD approach by encouraging learners to think critically, apply knowledge in context, and justify their decisions based on practical considerations. CBD is especially effective in revealing how learners transfer competences into real-life professional challenges.

2. Instructions



1. Select or design a case relevant to AI, Data Analysis, or Digital Data in SMEs.
2. Present the case to learners individually or in groups.
3. Guide them to identify key problems, risks, and opportunities.
4. Ask learners to propose solutions or strategies, supported by reasoning.
5. Facilitate a structured discussion where learners defend their ideas and consider alternatives.
6. Assess contributions based on clarity, logic, feasibility, and demonstration of competence.

3. Application in AI, Data Analysis & Digital Data

	AI: Decision-making around tool selection, ethical risks, data protection concerns, or workflow integration.
	Data Analysis: Interpreting flawed datasets, identifying analysis steps, evaluating data quality, or selecting appropriate tools.
	Digital Data: Discussing data governance, documentation processes, metadata quality, or storage decisions.

4. Example
Case: “An SME receives conflicting sales reports produced manually and by an AI-supported dashboard. The team must decide which data to trust, how to validate it, and how to improve the workflow.” Learners discuss: • differences between manual vs AI-generated data, • steps needed to check data quality, • how to improve the data pipeline, • ethical considerations related to relying on automated insights. The discussion provides insight into each learner’s analytical thinking and practical reasoning.

5a. Advantages	5b. Disadvantages
• Encourages deeper understanding through rich discussion. • Reveals reasoning and decision-making processes. • Links theory to authentic professional contexts. • Supports group learning and multiple viewpoints. • Easy to adapt to different learning levels.	• Requires well-designed cases to be effective. • Time-consuming in large groups. • Some learners may dominate the discussion. • Assessment can be subjective without clear criteria.

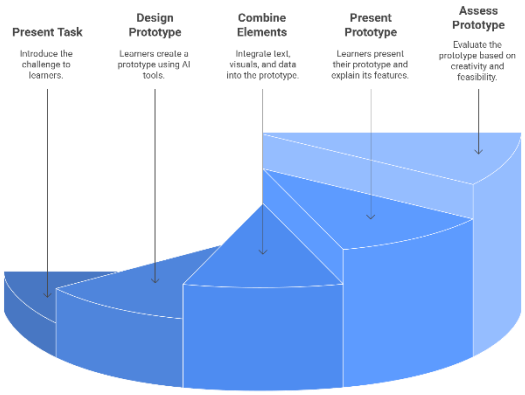
Assessment Method 13: Rapid Prototyping Task

1. Method Description

The Rapid Prototyping Task is a hands-on assessment method in which learners quickly design and present a simple prototype that demonstrates how AI, Data Analysis, or Digital Data tools could be applied to a specific SME challenge. The goal is not to produce a polished product but to visualise an idea, test assumptions, and demonstrate early-stage problem-solving and creativity.

In the SMERALD approach, rapid prototyping is highly relevant because AI and data-driven solutions must be explored iteratively. This method captures learners' ability to generate practical ideas, combine multiple tools, and transform concepts into tangible outputs.

2. Instructions



1. Present learners with a task or challenge (e.g., improving internal communication, creating automated reports, preparing client material).
2. Give them a short time frame (15–45 minutes) to design a prototype using any available AI or data tools.
3. Encourage them to combine text, visuals, workflows, or data elements.
4. Ask learners to present their prototype briefly, explaining:
   a) the core idea,
   b) which tools were used and why,
   c) what problem it solves,
   d) what the next development steps would be.
5. Assess the prototype based on creativity, feasibility, tool use, and clarity.

3. Application in AI, Data Analysis & Digital Data

	AI: Rapid creation of draft texts, scripts, images, mood boards, chatbot outlines, or automated email templates.
	Data Analysis: Quick mock-ups of dashboards, sketch visualisations, or simplified analysis workflows.
	Digital Data: Prototype structures for digital documentation, metadata systems, shared folders, or data quality checks.

4. Example

In a SMERALD workshop, learners were asked to design a prototype for a client communication workflow.
A participant created:

- an AI-generated script draft,

<table>
<tr><td colspan="2">

- a set of visual ideas produced with text-to-image tools,
- a simple process map for client feedback loops.

They presented how these elements could streamline content creation and reduce workload. The prototype was rough but demonstrated strong understanding of workflow integration.
</td></tr>
<tr><th>5a. Advantages</th><th>5b. Disadvantages</th></tr>
<tr><td>

- Encourages creativity and fast problem-solving.
- Produces tangible outputs in a short time.
- Excellent for team-based ideation.
- Reveals practical understanding of tools and workflows.
- Highly motivating and engaging for learners.
</td><td>

- Limited time may stress some learners.
- Results vary greatly depending on prior tool familiarity.
- Prototypes are not polished products and require follow-up.
- Assessment of creativity can be subjective.
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Assessment Method 14: Role-Play Simulation

1. Method Description

Role-Play Simulation is an interactive assessment method where learners take on specific roles within a realistic scenario involving AI, Data Analysis, or Digital Data. This format reveals how learners communicate, collaborate, make decisions, and navigate ethical or practical challenges when confronted with real-world SME situations.

For the SMERALD approach, Role-Play Simulation is particularly valuable because it assesses competences that are otherwise difficult to measure: attitudes, team communication, digital confidence, and critical thinking. It also supports experiential learning by bringing abstract concepts—such as data privacy, tool selection, or workflow design—into active practice.

2. Instructions

1. Create a realistic scenario involving multiple stakeholders (e.g., SME manager, data analyst, client, AI specialist).
2. Assign roles to learners and provide short role descriptions.
3. Present the scenario and clarify the challenge that needs to be addressed.
4. Allow learners time to prepare their arguments, questions, or ideas.
5. Facilitate a structured role-play session (10–20 minutes depending on complexity).

6. Conduct a debriefing session where learners step out of their roles and reflect on their decisions.
7. Assess performance based on communication, reasoning, problem-solving, and ethical awareness.

3. Application in AI, Data Analysis & Digital Data

	**AI:** Discussing the adoption of AI tools, addressing team concerns, negotiating data privacy decisions, or evaluating AI output quality.
	**Data Analysis:** Simulating cross-functional decisions around dataset interpretation, data cleaning priorities, or conflicting reports.
	**Digital Data:** Exploring issues around documentation standards, data governance policies, workflow integrity, or accidental data loss.

4. Example

Scenario: An SME is considering integrating an AI-supported customer service chatbot. The team must decide whether the tool is reliable, ethical, and beneficial.
Role-play participants include:

- SME manager (focus on efficiency)
- IT specialist (focus on security)
- Customer service representative (focus on usability)
- AI expert (focus on technical feasibility)

During the simulation, learners must:

- present arguments for or against implementation,
- negotiate trade-offs,
- analyse risks and opportunities,
- propose a realistic way forward.

The debrief reveals how well learners understand the impact of AI on workflow, stakeholders, and ethics.

5a. Advantages	5b. Disadvantages
• Brings theory into realistic practice. • Assesses communication, collaboration, and decision-making. • Makes ethical and interpersonal dimensions visible. • Highly engaging and suitable for group work. • Encourages empathy and multi-perspective thinking.	• Requires careful facilitation and well-prepared scenarios. • Some learners feel uncomfortable with role-play. • Assessment can be subjective without clear criteria. • Takes more time than written or individual tasks.

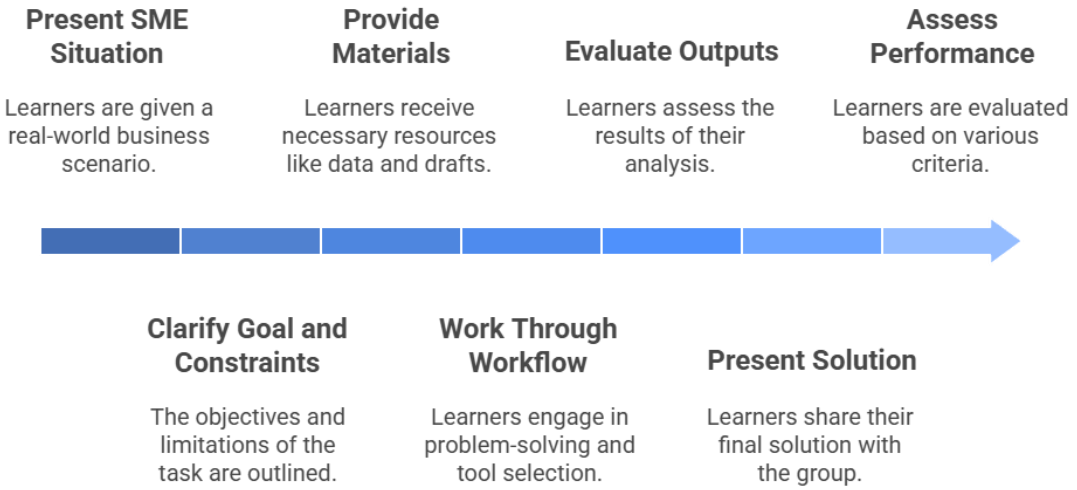
Assessment Method 15: SME-Context Simulation

1. Method Description

The SME-Context Simulation is a high-fidelity assessment method where learners work through a realistic, multi-step scenario that mirrors typical challenges faced by small and medium-sized enterprises. Unlike micro-scenarios or role-plays, this method simulates an entire workflow, allowing learners to demonstrate integrated competencies across AI, Data Analysis, and Digital Data.

This method aligns deeply with the SMERALD competence philosophy because it validates learning in authentic, contextualised environments. It assesses how well learners apply their knowledge and skills in a coherent, end-to-end process—reflecting real workplace challenges where AI and data competences rarely exist in isolation.

2. Instructions



1. Present learners with a full SME situation (e.g., creating a marketing workflow, analysing business performance, improving documentation processes).
2. Clarify the overall goal and constraints (time, resources, tools allowed).
3. Provide all needed materials such as example data, client notes, incomplete drafts, or visual materials.
4. Ask learners (individually or in groups) to work through the entire workflow:
   a) understanding the problem,
   b) selecting AI/data tools,
   c) analysing or generating content,
   d) evaluating outputs,
   e) presenting a final solution.
5. Facilitate a presentation or debrief session.
6. Assess performance based on solution quality, reasoning, tool use, and workflow logic.
7.

3. Application in AI, Data Analysis & Digital Data	
	**AI:** Integrating LLMs, image generators, or automation tools to support creative, analytical, or communication-based SME tasks.
	**Data Analysis:** Interpreting datasets, comparing multiple data sources, performing trend identification, or supporting business decisions.
	**Digital Data:** Ensuring proper data handling, documentation, storage, metadata structure, and workflow transparency.

4. Example

Scenario: *An SME needs a short, data-informed report for a client meeting, combining qualitative insights, charts, and a clear visual summary.* This scenario mirrors a typical real-world challenge where an SME must synthesise complex information under time pressure. The task requires learners not only to interpret numerical and textual data but also to decide which AI tools are most suitable for generating drafts, visualisations, or summaries. They must prioritise essential insights, evaluate the reliability of AI outputs, resolve discrepancies between qualitative and quantitative elements, and transform raw material into a professional, coherent report. This added layer of decision-making and problem-solving further reveals how learners manage constraints, ensure data accuracy, and communicate information effectively—core competences needed in modern SME environments.

Learners must:

- clean and interpret a small dataset,
- generate a narrative using AI tools,
- create visuals,
- document their process,
- present a final one-page draft.

The simulation reveals how well learners combine multiple competence areas and make realistic decisions under constraints.

5a. Advantages	5b. Disadvantages
• Provides strong, authentic evidence of competence. • Demonstrates integration of multiple skills and tools. • Highly relevant for SME environments. • Engaging and motivating for learners. • Supports summative assessment.	• Provides strong, authentic evidence of competence. • Demonstrates integration of multiple skills and tools. • Highly relevant for SME environments. • Engaging and motivating for learners. • Supports summative assessment.

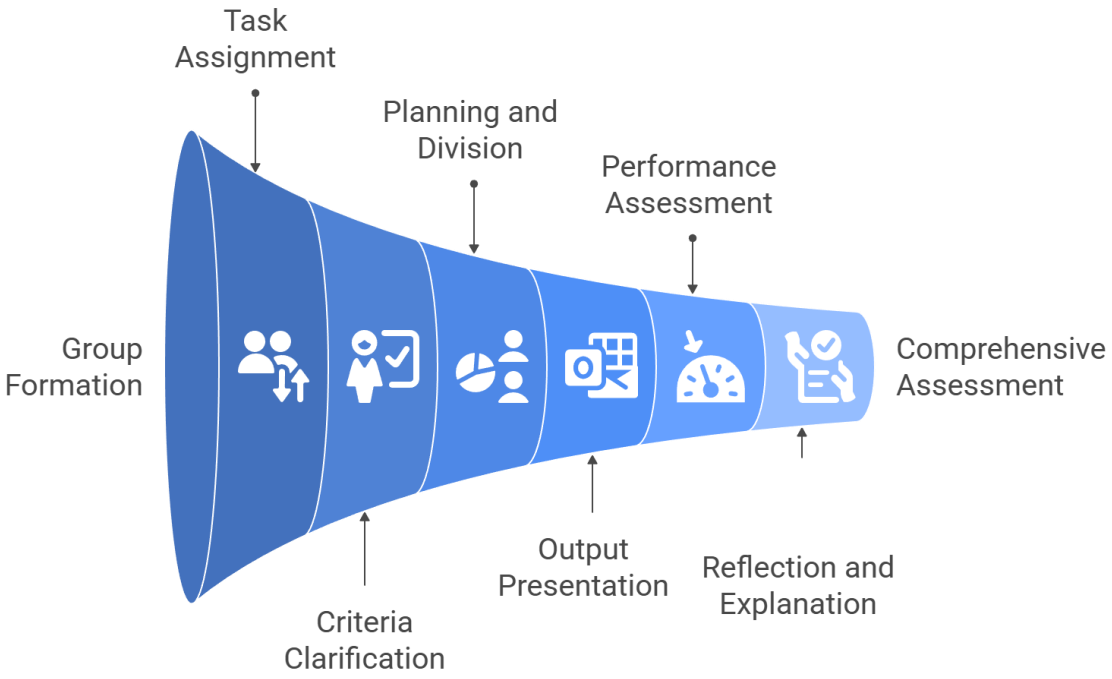
Assessment Method 16: Group Output Assessment

1. Method Description

Group Output Assessment evaluates the collective performance of a team as they collaboratively produce a shared output—such as a presentation, workflow prototype, data dashboard, AI-generated concept, or strategic plan. This method highlights not only the quality of the final product, but also the group's collaboration, task distribution, collective reasoning, and integration of competences across AI, Data Analysis, and Digital Data.

In the SMERALD context, many SME tasks are inherently collaborative. A team developing a marketing concept, analysing customer data, or redesigning documentation workflows must navigate diverse perspectives, distribute roles efficiently, and combine different competences. Group Output Assessment reflects this reality and reveals how well learners can function as a team in a digital transformation setting.

2. Instructions



1. Assign learners to groups of 3–6, depending on task complexity.
2. Provide a shared task requiring a tangible, high-quality output.
3. Clarify both content-related criteria (quality, logic, tool use) and process-related criteria (collaboration, communication, decision-making).
4. Allow time for groups to plan, divide responsibilities, and work toward the shared goal.
5. Ask groups to present their final output.
6. Assess performance against both product and process criteria.
7. Facilitate a short reflection where groups explain their decisions and internal workflow.

3. Application in AI, Data Analysis & Digital Data	
	**AI:** Creating an AI-supported content concept, chatbot outline, client presentation, workflow automation idea, or mood-board using image generation.
	**Data Analysis:** Producing a joint data report, dashboard, visualisation set, or interpretation summary.
	**Digital Data:** Designing documentation structures, metadata templates, governance guidelines, or process maps.

4. Example

During the SMERALD training in Palermo, a group created a combined AI-supported concept draft for a fictional SME needing improved internal communication.
The group:

- collected input from all members,
- applied AI tools for drafting and visualisation,
- reviewed and refined results collectively,
- presented a well-structured workflow and example outputs.

Their work demonstrated integrated competences and strong teamwork.

5a. Advantages	5b. Disadvantages
• Reflects authentic SME teamwork dynamics. • Encourages collaboration, negotiation, and shared problem-solving. • Produces rich, multi-perspective outputs. • Allows learners with different strengths to contribute meaningfully. • Easy to integrate into project-based training formats.	• Some learners may contribute more than others. • Requires clear criteria to evaluate both product and process fairly. • Facilitation needed to avoid dominance by certain group members. • Time requirements may be higher than for individual tasks.

Ensuring Quality

in Competence-Oriented Assessment Within SMERALD

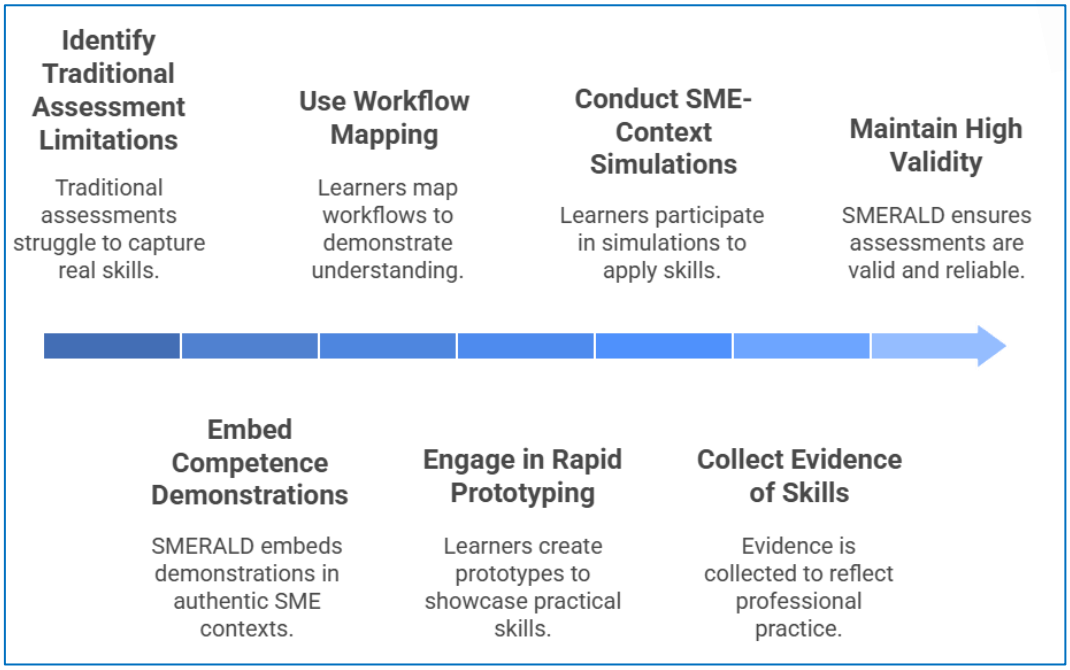
Quality is not an add-on in the SMERALD Assessment Framework—it is the foundation that makes the entire system trustworthy, transparent, and transferable. As AI, Data Analysis, and Digital Data continue to reshape professional environments, VET professionals and SME trainers need assessment approaches that do more than measure performance. They need methods that capture *real competence*, support learner development, and reflect authentic workplace demands.

This repository of assessment methods was designed for exactly that purpose. It brings together structured, competency-based, practice-oriented approaches that align with the SMERALD Competence Framework and the LEVEL5 validation philosophy. Each method emphasises context, evidence, reflection, and practical application—key elements that ensure assessment results are meaningful and reliable.

Competence Validity Through Context

Traditional assessments often struggle to capture real skill in dynamic digital work environments. SMERALD solves this by embedding competence demonstrations in authentic SME contexts. Whether through workflow mapping, rapid prototyping, or SME-context simulations, learners show what they can actually *do*, not just what they can remember.

By anchoring assessments in real tasks and realistic challenges, SMERALD maintains high validity: the evidence collected reflects the complexities of professional practice and digital transformation.



Reliability Through Structure and Transparency

Each method in this handbook follows a consistent structure, offering clarity for trainers and learners:

- what the method measures,
- how it should be applied,
- what quality criteria apply,
- and how evidence can be documented.

This structured approach ensures that different trainers—even in different institutions or countries—can apply the same method with a high degree of consistency. Reliability increases further when SMERALD rubrics, SPIDER reflections, and LEVEL5 descriptors are used to anchor judgments.

Learner-Centred Fairness and Inclusivity

Quality in assessment is also about fairness. The SMERALD approach recognises that learners bring different professional backgrounds, technological confidence levels, and personal learning styles.

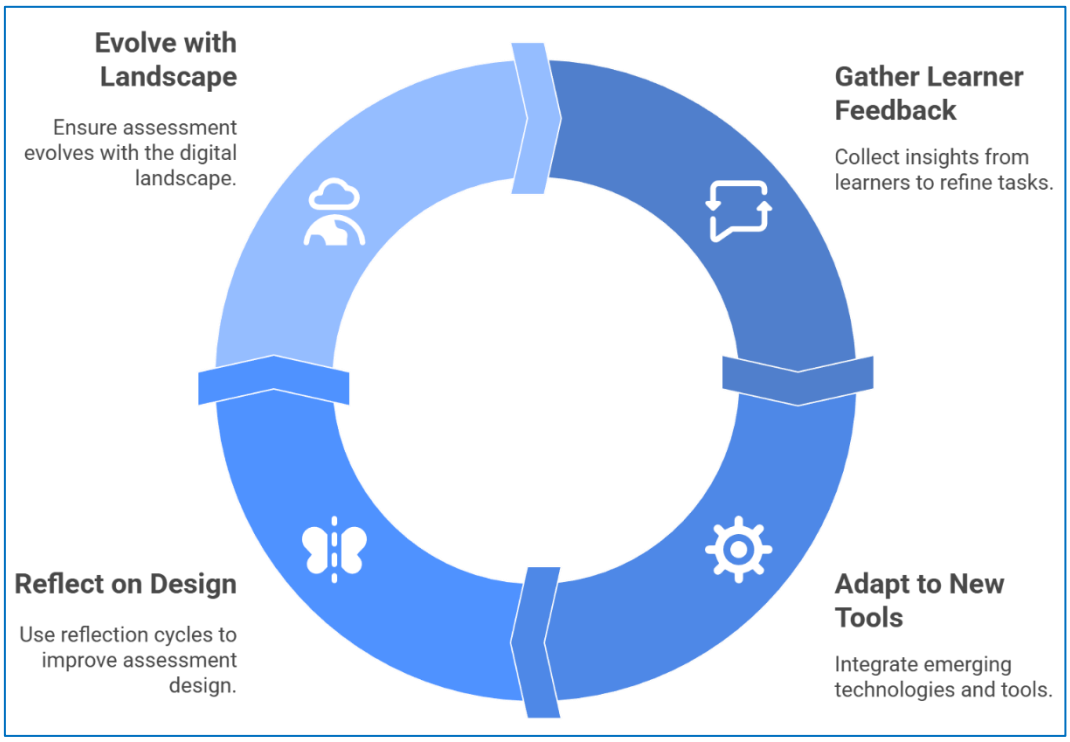
By offering a diverse set of assessment methods—visual, written, discussion-based, digital, collaborative—SMERALD ensures that every learner can demonstrate competence in multiple ways. This reduces bias and supports equitable assessment across diverse SME and VET populations.

Continuous Improvement: A Core Part of Quality

High-quality assessment is never static. Trainers are encouraged to:

- refine tasks based on learner feedback,
- adapt methods to new tools and workplace realities,
- integrate emerging AI and data technologies,
- use reflection cycles to continuously improve assessment design.

Because SMERALD is competence-driven and practice-oriented, assessment can evolve alongside the fast-paced digital landscape.



A Sustainable Assessment Culture

Finally, the SMERALD approach aims not only to assess competence but to **build a culture of competence development** within SMEs and VET organisations. Quality grows when:

- learners understand what competence means,
- trainers feel confident using diverse assessment formats,
- organisations value validation and reflection,
- and digital tools are used ethically, transparently, and purposefully.

By combining quality criteria, structured methods, and authentic contexts, SMERALD offers an assessment ecosystem that is robust, adaptable, and future-ready.

This closing chapter completes the SMERALD Assessment Repository. Trainers, facilitators, and VET professionals are encouraged to adapt, enrich, and expand these methods as AI and data-driven technologies continue to develop. The goal is not just to measure competence—but to support learners and organisations on their journey towards confident, reflective, and responsible digital transformation.