BlendED

African BlendEd Course: novel pedagogies boosting employability and socio-economic prosperity

Monitoring, Evaluation & Learning through Feedback and Reflection

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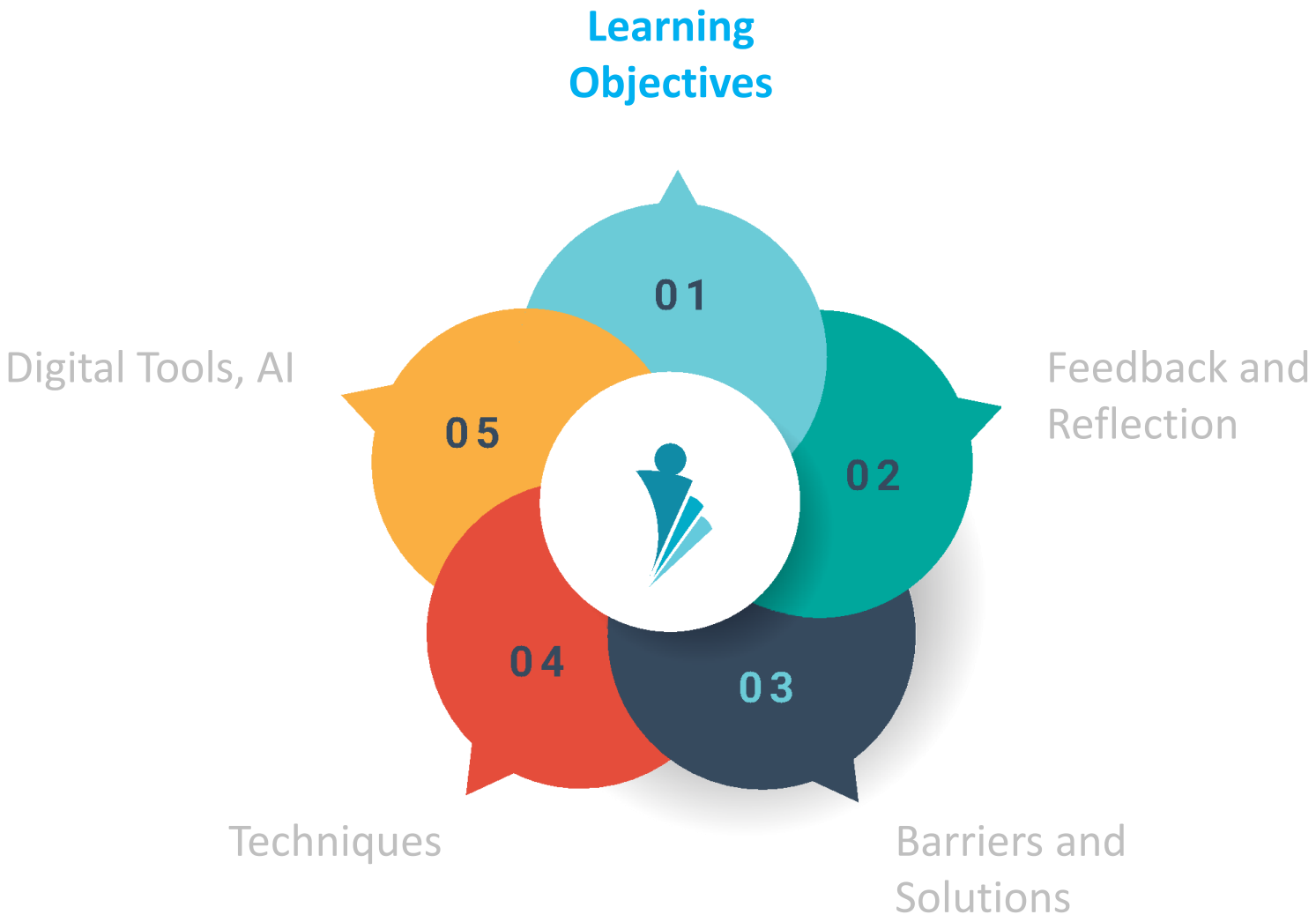
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Agenda

1. Learning objectives
2. Feedback and reflection
3. Barriers and solutions
4. Feedback and reflection techniques
5. Digital tools and AI

Outline


Learning Objectives
01
Feedback and Reflection
02
Barriers and Solutions
03
Techniques
04
Digital Tools, AI
05

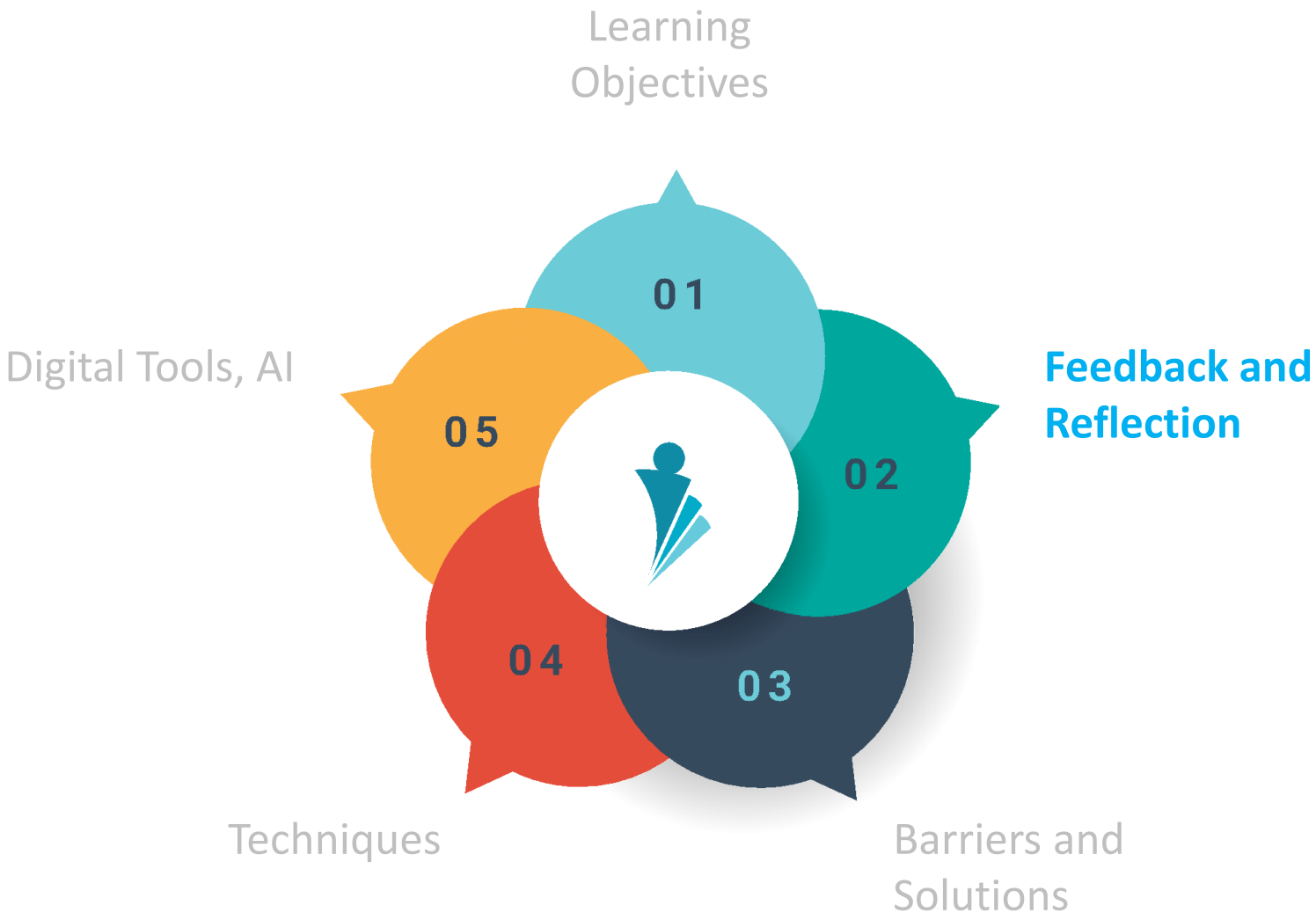
Purpose

Meaningful feedback and reflection are essential for fostering student engagement and continuous growth. This guide introduces practical **tools, techniques and strategies for promoting effective self and group feedback and reflection** that can be applicable in both physical and hybrid learning environments to transform feedback into a dynamic and empowering experience

Learning objectives

- Describe the role of feedback and reflection in education
- Organize self and group-reflection sessions in learning environments
- Integrate continuous feedback mechanisms into teaching plans and curricula
- Explore feedback tools and techniques to improve student learning achievements.

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Why is student feedback important in STEAME/PBL?

Enhancing student learning and metacognition

- Develop self-awareness of the learning process, monitoring and controlling it: what I understand, what challenges I face, and how I can improve
- Students are encouraged for self-directed learning and take charge of their own progress
- Students strengthen problem-solving skills
- Learn about distinct ways of addressing a challenge

Improving collaboration and communication

- Peer and group reflection ensures constructive communication
- Systematic feedback helps students learn how to give and receive constructive criticism
- Building teamwork skills necessary for real-world problem-solving

Encouraging creativity and innovation

- Revisit and refine ideas, key aspect of iterative thinking in STEAME
- Stimulate creativity and innovation
- Embrace failure as a learning opportunity
- Foster innovation by promoting iteration and experimentation.

Why is student feedback important in STEAME/PBL?

Encouraging ownership and intrinsic motivation

- Student-centred feedback and reflection, shift responsibility for learning onto students
- It increases their engagement and intrinsic motivation
- Students take ownership of their projects and become active participants in their growth

Strengthening teacher-student connection

- Create a
- Teachers
- Ensures s
- Teachers

Why feedback and reflection matter:

- Critical for student growth and deeper learning
- Central to PBL and STEAME for continuous improvement
- Builds skills like self-regulation, collaboration, and critical thinking.

Furthering stu

- Reflectio
- Constantly refining work based on input
- Builds professional skills like adaptability, resilience, and communication
- Prepares students for lifelong learning beyond the classroom

Bridging the gap between process and product

- Feedback ensures that students complete a project and deliver a product …
- … but also understand and grow from the experience

Benefits of feedback and reflexion in education

Benefits for teachers

Better understanding of student needs

- Real-time insights into student progress and challenges

Improved learning achievements

- Helps students refine their work and reach higher standards

Stronger classroom culture

- Promotes trust, collaboration, and openness to improvement

Reduced grading stress

- Fewer last-minute corrections due to ongoing feedback

Professional growth

- Encourages teachers to innovate and adapt.

Benefits for students

More control over learning

- Encourages self-assessment and goal-setting

Better work and performance

- Leads to polished, higher-quality outcomes

Soft skills

- Builds collaboration, communication, and adaptability

Increased motivation and engagement

- Connects learning to personal goals and interests

Resilience and growth mindset

- Teaches students to embrace feedback and see mistakes as learning opportunities.

Benefits of feedback and reflection

Teachers

Better understanding of student needs
- Real-time insights into student progress and challenges

Improved learning achievements
- Helps students refine their work and reach higher standards

Stronger classroom culture
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Reduced Grading Stress
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Professional growth
- Encourages teachers to innovate and adapt

Students

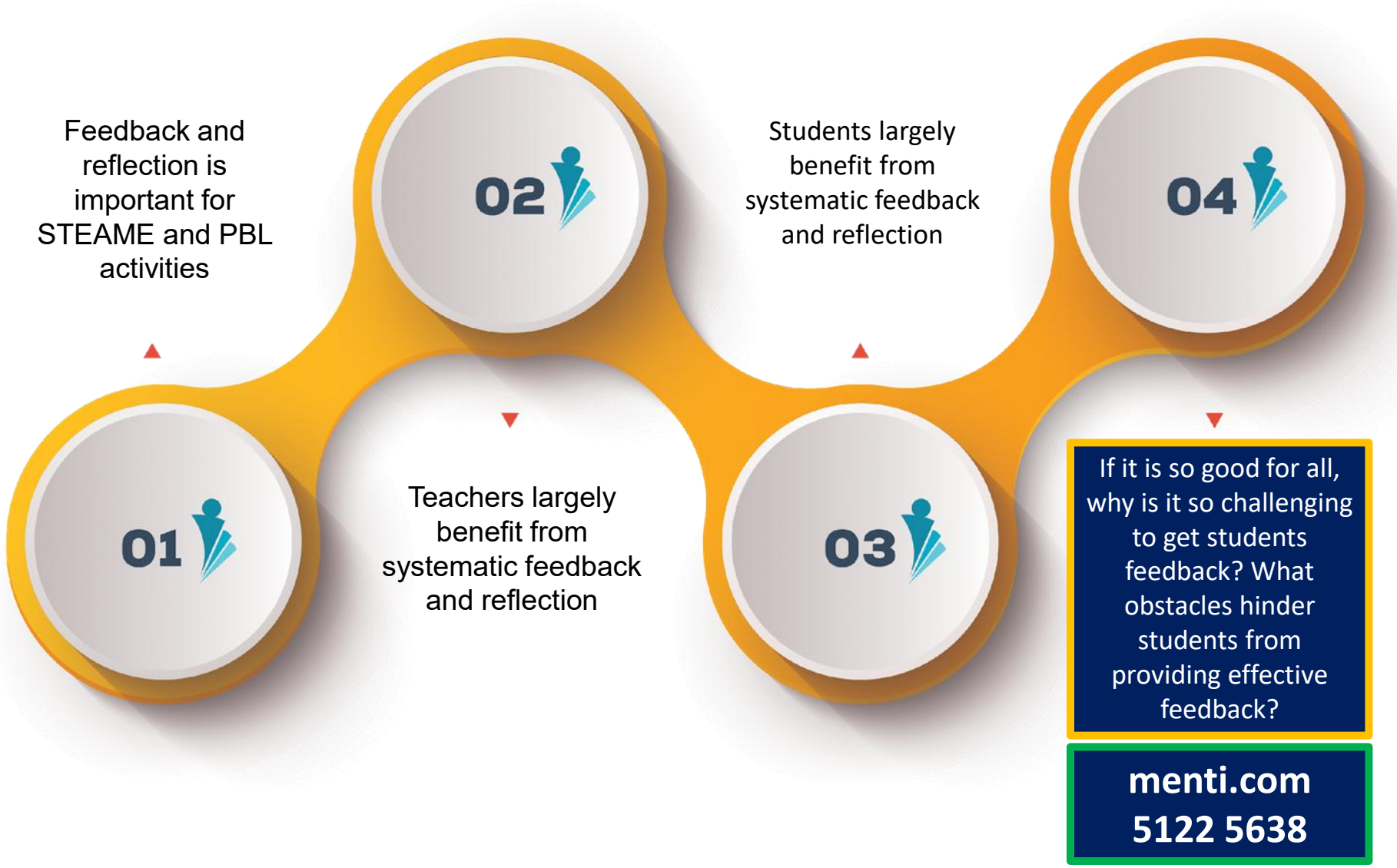
More control over learning
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- Connects learning to personal goals and interests

Resilience and growth mindset
- Teaches students to embrace feedback and see mistakes as learning opportunities.


Feedback and reflection is important for STEAME and PBL activities
01
Teachers largely benefit from systematic feedback and reflection
02
Students largely benefit from systematic feedback and reflection
03
If it is so good for all, why is it so challenging to get students feedback? What obstacles hinder students from providing effective feedback?
04
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Outline

Learning Objectives

Digital Tools, AI

Feedback and Reflection



Techniques

Barriers and Solutions

Barriers to students' feedback

- **Lack of experience or confidence**
- **Fear of criticism, hurting others or negative consequences**
- **Feedback fatigue**
- **Misunderstanding the purpose of feedback**
- **Feeling the feedback won't be acted upon**
- **Lack of clear instructions**
- **Lack of time, space or opportunity for feedback and reflection**
- **Cultural or personal differences.**

Lack of experience or confidence

- Not know how to give effective feedback
- Feel unsure about their opinions
- Fear being judged
- Think their input does not matter
- Do not want to standout

Fixing it

- Explain the purpose of feedback and feedback skills
- Introduce scaffolded reflection questions to guide students
- Conduct role-playing exercises in simulated scenario
- Share examples of good and bad feedback

Lack of experience or confidence

Why is it difficult:

Students may not know how to give meaningful feedback or feel unsure about their opinions.

Solution: teach and model feedback skills

- Use scaffolded reflection prompts and sentence starters (e.g., “One strength of this project is...”).
- Conduct role-playing exercises to practice giving and receiving feedback.
- Share examples of both effective and ineffective feedback.

Fear of criticism, hurting others or negative consequences

- Hesitant to give honest feedback to avoid criticizing peers or facing conflict
- In group work, students might avoid saying anything negative to maintain friendships

Fixing it

- Build a safe and supportive environment by emphasizing that feedback is about growth, not judgment
- Using anonymous feedback tools, collect suggestions that you later discuss as a group
- Promote empathy in feedback by asking students to frame suggestions positively
- Start showing contributions are valued to build trust before moving into constructive feedback
- Set ground rules like “Respect others’ ideas”

Fear of criticism, hurting others or negative consequences

Why is it difficult:

Students may avoid giving honest feedback to prevent conflict or hurting others' feelings.

Solution: build a safe and supportive environment

- Emphasize that feedback is about growth, not judgment.
- Use anonymous feedback tools like Padlet or Mentimeter.
- Promote empathy in feedback by framing suggestions positively (e.g., "Have you thought about trying...?").
- Start with positive feedback (peer shout-outs) before moving to constructive suggestions.

Feedback fatigue

- When feedback requests are too frequent, overwhelming, or poorly structured
- Students get tired of repetitive questions without seeing any real impact
- Students lose motivation if they feel like their feedback doesn’t lead to change or improvement.
- When asked for the same type of feedback week after week without follow-up action, students stop taking it seriously.

Fixing it

- Keep feedback relevant and impactful.
- Do not overdo feedback requests; focus on key moments in the learning process
- Plan them in advance
- Keep feedback sessions short, structured, and interactive (e.g., small-group reflections)
- Act on the feedback students provide and show how it has impact on the results.

Feedback fatigue

Why is it difficult:

Frequent or poorly structured feedback requests can overwhelm students.

Solution: keep it relevant and impactful

- Focus feedback on key moments in the learning process.
- Act on feedback and show students how it leads to improvement.
- Keep sessions short, structured, and interactive.

Misunderstanding the purpose of feedback

- Students often see feedback as a way for teachers to assess or judge them
- Without clear communication about the purpose of reflection and feedback, students may perceive it as a task with no personal benefit
- Students might write generic answers on a feedback form because they don’t see how it will help their learning process.

Fixing it

- Clearly explain why you are engaging them in feedback
- Tell students how feedback will benefit them directly – link it to their success and growth.
- Make feedback visible by mapping it to learning goals or including it in portfolios.
- Use reflection journals where students track how feedback helped improve their projects
- Introduce feedback as to tool, a superpower for improving project outcomes
- Show before-and-after examples of how feedback helped previous students succeed.

Misunderstanding the purpose of feedback

Why is it difficult:

Students may see feedback as a judgment rather than a tool for growth.

Solution: clearly explain the "why"

- Connect feedback to personal growth and learning goals.
- Make feedback visible by mapping it to learning objectives.
- Use reflection journals for students to track how feedback has improved their work.

Feeling the feedback won't be acted upon

- You ask for feedback frequently but never get back to it, never discuss it with the students
- Students don’t understand why they should bother since they never know how their feedback triggered any changes

Fixing it

- Analyse students- feedback and get back to students to discuss the observed concerns and trends
- Explain students how their feedback was or will be imprinted in the activities

Feeling the feedback won't be acted upon

Why is it difficult:

Students lose interest in providing sound feedback.

Solution: clearly explain the impact of their feedback

- Connect feedback to the class activities, class plan, evaluation, course programme, course timeline.
- Make the impact of their feedback explicit and visible.
- Come back to the students to understand if the changes were effective.

Lack of clear instructions

- Students miss the point because they did not understand the purpose
- Feedback is useless because it does not follow the needed norms/rules

Fixing it

- Make sure students understand the message and get it right
- Ask students to repeat what they are expected to do for the feedback.

Lack of clear instructions

Why is it difficult:

Students see feedback as unnecessary disturbance and don’t pay attention

Solution: clearly explain the purpose and raise awareness to the relevance of feedback for better education

- Make sure students are paying attention.
- Don’t ask for feedback when students are in a rush to leave the classroom; leave it for the next class or do it online, after classes.

Lack of time, space or opportunity for feedback and reflection

- Reflection requires dedicated time and a safe environment, often overlooked in fast-paced educational settings
- When feedback is rushed, students cannot think deeply or articulate meaningful responses
- A 5-minute feedback session at the end of a long class won't give students the chance to reflect.

Fixing it

- Plan and create dedicated time for feedback and reflection.
- Build regular feedback and reflection time into class schedules (even just 10 minutes).
- Use exit tickets to gather quick, focused reflections.
- Incorporate digital portfolio platforms where students can reflect at their own pace.

Lack of time, space or opportunity for feedback and reflection

Why is it difficult:

Reflection requires dedicated time, which can be scarce in busy classrooms.

Solution: create dedicated time for feedback and reflection

- Build regular reflection time into the class schedule.
- Use exit tickets for quick, focused reflections.
- Incorporate digital portfolio platforms like Seesaw or Google Sites for self-paced reflection.

Cultural or personal differences

- Students may come from backgrounds where giving feedback to authority figures or peers is not a common practice
- Others may be naturally more reserved
- Feedback cultures vary; what feels normal in one setting can feel uncomfortable in another
- In a multicultural classroom, some students may hesitate to provide feedback for fear of seeming disrespectful.

Fixing it

- Be culturally responsive and flexible
- Offer multiple ways to give feedback: written, verbal, visual, etc.
- Encourage group discussions to reduce pressure on individuals.
- Be mindful of cultural norms; frame feedback in ways that feel respectful and safe for all students.
- Use an interactive whiteboard app where students express feedback in ways that feel comfortable.

Cultural or personal differences

Why is it difficult:

Cultural norms and personal preferences can affect how students engage with feedback.

Solution: be culturally responsive and flexible

- Offer multiple feedback formats: written, verbal, visual.
- Encourage group discussions to reduce individual pressure.
- Be mindful of cultural norms and adapt feedback practices accordingly.

Elementary practices for effective feedback

- Teach students how to give constructive feedback, use examples and practice
- Normalize feedback as part of the learning process, showing how it leads to improvement
- Use digital tools (like anonymous surveys or reflection apps) to make it easier for students to share honest feedback
- Act on the feedback so students see that their input matters
- Make feedback fun and engaging
- Use gamified feedback sessions or reflection prompts with creative elements (e.g., ask students to write a tweet-length reflection or design a “meme” summarizing their experience)
- Co-create feedback guidelines and formats students are comfortable with
- Feedback may be short; make it simple and find innovative ways of engaging students
- Know your students and give alternative feedback modes and formats accommodating all, Universal Design for Learning (UDL).

Elementary practices for effective feedback

- **Make feedback fun**: use creative approaches like gamified feedback sessions or meme-based reflections
- **Collaborate with students**: co-create feedback guidelines and involve them in designing the feedback process
- **Follow up**: always close the loop by showing how student feedback influenced decisions or changes.
- **Plan feedback and reflection activities**: plan early, when planning your class. Consider key elements, such as, purpose, prompt, output, modality, channel, follow-up, ...

Hands-On: Elementary practices for effective feedback

- Imagine you have just given a class on “online safety”.
- Taking what we have just discussed into consideration, design a **feedback and reflection activity** for your students. Consider addressing Universal Design for Learning issues.

- Refer to core elements:
  - purpose (summarize, contextualize, compare to, criticize, build on top, …),
  - prompt, engaging students
  - expected output (content, format),
  - channel (online/offline, tool),
  - modality (self, group),
  - duration,
  - follow-up (when, what, how)

- Are you working face2face? Use paper and pencil
- Are you working online? Use miro, for instance.

Outline

Learning Objectives

Digital Tools, AI



Feedback and Reflection

Techniques

Barriers and Solutions

Self feedback and reflection techniques

Guided Reflection Prompts

Structured prompts help guide students' thinking about their learning experience
Focus on different aspects of learning: process, collaboration, outcomes, and emotions.

- *What was the most challenging part of this project? How did you overcome it?*
- *How has your understanding of the topic changed?*

Learning Journals, Logbook

Encourages continuous reflection and documents the learning journey.

Digital Portfolios

Allows students to see their growth over time and reflect on their progress. Ideal for project-based learning environments.

"3-2-1 Reflection"

Students write:

- 3 things they learned,
- 2 questions they still have,
- 1 thing they found interesting or surprising.

Group feedback and reflection techniques

Think-Pair-Share
Students reflect individually on a question, pair up to discuss their thoughts, and then share with the larger group. Encourages individual reflection first, followed by peer discussion. This technique fosters collaboration while allowing quieter students to participate.

Peer Review Circles
Students form small groups and provide structured feedback on each other's work. Guided by rubrics or reflective questions. Promotes collaborative learning and critical thinking, with multiple perspectives contributing to individual growth.

Fishbowl Discussion
A small group discusses a reflective question in the centre ("the fishbowl"), the rest observe and take notes. The roles are then switched. Develops listening and discussion skills while providing multiple perspectives on a reflection topic.

The Six Thinking Hats
Participants analyse a situation from six different perspectives, represented by hats of different colours: White (facts and information), Red (emotions and feelings), Black (caution and risks), Yellow (positive aspects), Green (creativity and new ideas), Blue (process control). Encourages balanced reflection, addressing both rational and emotional aspects of an experience.

World Café Method
Participants rotate through multiple small group discussions on different reflective questions or topics. Each table has a host who summarizes the conversation for the next group. Promotes large-group reflection while maintaining intimacy and depth of discussion.

Feedback and reflection in PBL/STEAME cycle

Phase	Activity
1. Launch	Introduce driving question
2. Investigation	Research and explore
3. Ideation	Brainstorm solutions
4. Creation	Develop product or solution
5. Presentation	Share final product
6. Review	Reflect and refine for the future

Common challenges and solutions

Challenge	Solution
Ensuring meaningful, not superficial, reflection	Provide structured prompts and clear rubrics.
Resistance to peer feedback	Build a classroom culture of trust and respect.
Managing feedback in large classes	Use digital tools to automate and scale feedback processes.
Time constraints	Integrate feedback and reflection into daily routines. Plan it.

Hands-On: F&R, barriers/solutions, techniques

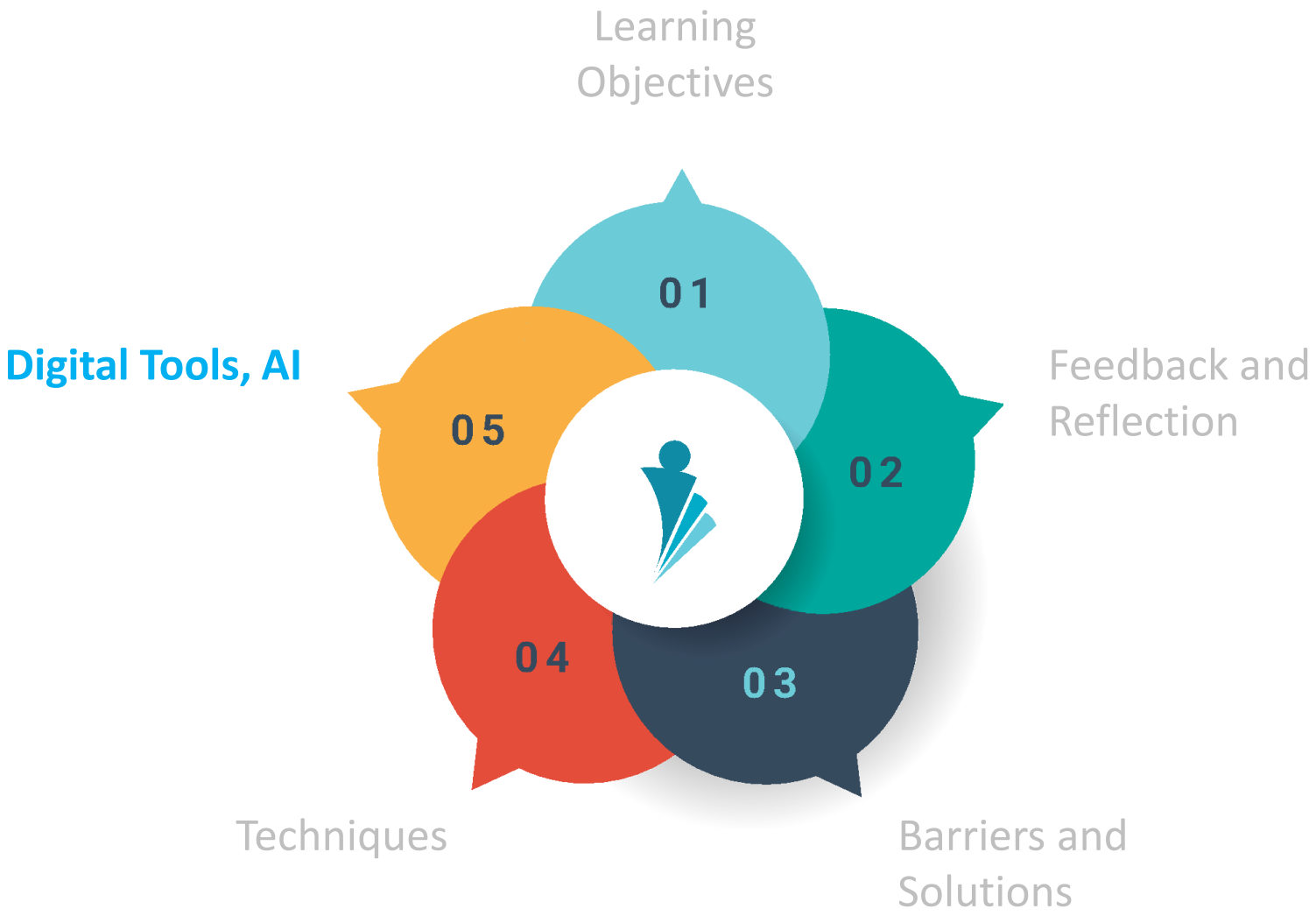
White Card: One Question You Still Have
This card should contain a question that is still unclear to you, or a topic that you would like more information on.

Be specific: Instead of a general question like "I don't understand the project," try to ask a specific question like, "What is the main goal of the new marketing strategy, and how will it be measured?"
Consider the context: If you are in a specific class or meeting, the question should relate to the topic being discussed.
Examples:
"How can I apply the principles of critical thinking to everyday problem-solving?"
"What are the potential long-term effects of climate change on our local ecosystem?"
"Can you provide more examples of how to implement the new software features effectively?“

Pink Card: One New Thing You Learned Today
This card should document a specific piece of new knowledge, a new skill, or a new way of thinking that you acquired during the workshop, so far.

Be concrete: Focus on one specific fact, idea, or skill rather than a broad concept.
Show enthusiasm: Acknowledge the value or significance of what you learned to demonstrate your engagement.
Examples:
"I learned that the term 'cognitive bias' refers to systematic patterns of deviation from norm or rationality in judgment."
Indeed
"I learned a new keyboard shortcut for copying and pasting in my design software, which will save me time."
"I learned the importance of active listening during a difficult conversation, which helped me understand the other person's perspective better."

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Digital tools to facilitate feedback and reflection

Perusall

A collaborative annotation platform that transforms reading assignments into interactive discussions. Students can highlight text, leave comments, and respond to each other's annotations in real-time.

- Collaborative text annotation
- Threaded discussions within readings
- Automated grading of participation and quality of contributions
- Teacher prompts to guide discussions

Flipgrid

Flipgrid allows students to record short video responses to teacher prompts, facilitating video-based discussions. Peers can respond with videos or comments.

- Video recording and editing tools
- Peer-to-peer video responses
- Moderation and privacy controls
- Integration with Microsoft Teams and Google Classroom

Digital tools to facilitate feedback and reflection

Mentimeter

An interactive presentation tool that enables real-time polling, quizzes, and word clouds to foster engagement and collect feedback.

- Live polling and quizzes
- Word cloud generation
- Multiple-choice and open-ended questions
- Exportable results for analysis

Padlet

A digital bulletin board that allows students to post text, images, videos, and links. It’s a versatile tool for brainstorming, group reflections, and collaborative projects.

- Customizable boards (timeline, map, grid, wall)
- Multimedia support (text, images, videos)
- Real-time collaboration
- Integration with Microsoft Teams and Google Workspace

Digital tools to facilitate feedback and reflection

EdPuzzle

EdPuzzle enables teachers to embed questions and notes into videos, turning passive video watching into an interactive learning experience.

- Embed multiple-choice and open-ended questions
- Track student progress and responses
- Integration with Google Classroom
- Library of pre-made content

PollEverywhere

PollEverywhere allows for real-time polling during lectures or discussions, with instant results displayed as charts or word clouds.

- Live multiple-choice, open-ended, and clickable image questions
- Anonymous responses
- Integration with PowerPoint and Google Slides
- Exportable reports

Find more details at:
Monitoring, Evaluation & Learning through Feedback and

Using AI for feedback and reflective practice

Hands-On: The Six Thinking Hats

Using AI for Feedback and Reflection in education

- White (facts and information)
- Red (emotions and feelings)
- Black (caution and risks)
- Yellow (positive aspects)
- Green (creativity and new ideas)
- Blue (process control)

Using AI for feedback and reflective practice

Integration of artificial intelligence (AI) into educational practices is a **paradigm shift**

- AI is **not a mere replacement** for human educators but **a powerful partner** capable of fundamentally transforming the learning cycle
- It can provide **immediate, personalized, and consistent feedback**
- And **frees educators to focus on the higher-level pedagogical tasks**.

Using AI for feedback and reflective practice

AI tools enhance students' **learning achievements** by:

- **accelerating** the feedback loop
- **personalizing** instruction to meet individual student needs, tailoring feedback and reflection hints to each students learning profile
- acting as a catalyst for metacognition and reflection by **scaffolding the learning process**
- empowering students to perform **effective monitoring and control** of their learning path.

Using AI for feedback and reflective practice

The **role of AI** in the reflective process:

- is not to generate a polished reflective paper, but to **provide a scaffold for reflection** itself
- AI can act as a “tireless tutor,” **offering hints and guidance without giving the final answer**
- encourage learners to **work through their own solutions and reflect on their errors**
- **reinforce understanding** in a way that passive consumption of a finished answer cannot
- transforming feedback and reflection from a static, one-time event, into a **dynamic, continuous, and personalized process**
- help **educators save time** while providing more personalized and timely support to students
- being a supportive tool that **aids – rather than replaces – the student’s intellectual effort**.

Using AI for feedback and reflective practice

AI tools **assist students**' feedback and reflection with powerful features:

- by providing **instant, personalized, and adaptive guidance**
- identifying **learning gaps**
- offering **tailored suggestions for improvement** in writing, problem-solving, self-assessment and guided reflection
- promoting **active engagement with feedback**, enabling critical evaluation of AI-generated suggestions, **supporting metacognition** and encouraging consistent learning through **real-time support**.

AI features enhancing feedback and reflection in education

Personalized feedback at scale

- **Effective feedback is a cornerstone of learning**, but traditionally hampered by logistical and human constraints
  - overwhelming grading workloads lead to **significant delay** between submission and feedback
  - delayed feedback allows for **misconceptions to take root** before they can be addressed
  - **limited time available** for high-impact, human-centred activities, such as one-on-one student support, curriculum development, and other

- **AI can:**
  - analyse student work and performance data to prov**ide instant tailored suggestions, recommendations, corrections and resources** to address specific knowledge gaps
  - **encourage students to act immediately on feedback** while the learning is still fresh
  - **generate personalized reflective prompts** guiding students in assessing their learning processes and identifying areas for growth
  - … thus, **reducing teachers' workload**.

Facilitate self-reflection and metacognition

- **AI can:**
  - prompt students with guided reflection questions based on their work and performance ("Why did you choose this method?", "What would you do differently next time?")
  - summarize students' learning logs or reflective journals
  - help learners identify patterns of strengths and areas needing development
  - scaffold self-regulation, enabling learners to plan, monitor, and evaluate their own learning.

Enhancing peer feedback

- **AI can:**
  - frame constructive feedback, ensuring that comments are balanced, respectful, and targeted (rather than vague or purely critical)
  - such guidelines can improve the quality and usefulness of peer feedback in PBL settings.

Data-driven insights

- **AI can:**
  - analyse large datasets to find trends and patterns in student performance, offering insights that human educators might miss
  - dashboards or analytics allow both students and teachers to see where improvement has occurred and where persistent difficulties lie.

Inclusive and accessible feedback

- **AI can:**
  - provide feedback in multiple formats, such as text, audio, and video, and in a variety of languages
  - accommodate diverse learning profiles and supporting non-native speakers
  - multimodal systems make it possible for students with different accessibility needs (e.g., visual or auditory impairments) to receive guidance in the format that best suits them, fostering equitable participation
  - assist teachers in designing and implementing Universal Design for Learning.

Teacher empowerment

- **Educators lack time for meaningful student engagement**
  - Reducing administrative burdens enables a more human-centred pedagogy in which teachers can devote more energy to direct interaction and individualized guidance.
- **AI can:**
  - reduce uncons… …le evaluator fatigue in grading
  - automate rout… …nd rubric creation
  - … thus signific…
  - free educators to inspire, mentor, and build genuine connections with students

Redefinition of the teacher's role from an administrative focus on content delivery and assessment to a **creative, relational role emphasizing higher-order guidance and personal support**.

The **technology supports** teacher expertise **rather than replacing** professional judgment.

Challenges and Pitfalls

Challenges and Pitfalls

- **Over-reliance on AI** can lead to **reduced critical thinking or student passivity**. Human oversight is needed; teachers are expected to verify, adapt, and contextualize AI output for domain relevance and appropriateness
- Feedback from **AI lacks the empathy and motivational nuances of human feedback**. The natural integration of AI tools in the classroom with teacher oversight is of critical importance
- **Practical and ethic** nsparency, insufficient privacy, bias in AI r ogical safeguards with critical digital litera
- A **clear set of insti** to safeguard learners and uphold ethical

a) Human oversight is needed
b) Balanced approach combining technological safeguards with critical digital literacy
c) A clear set of institutional policies
d) Ongoing teacher training.

Designing AI-resistant assignments

- The rise of GenAI demands for a shift in assignment design.
- Simply asking for a traditional reflective paper is no longer sufficient for assessing authentic student thought, because current AI models
- Design assignment
- Assignments can b AI tools:
  - detailing the
  - the justificati
  - reflective pro ill you use it?" further support auth

Students and educators must **learn to use AI critically**, to question and argue with it, and to take ownership of their own words

This need for new assignment designs underscores a broader educational imperative: the **development of AI literacy** – understanding how AI works, its limitations, and how to use it ethically and effectively – should be a core component of the curriculum for students, teachers, and administrators alike.

Important considerations and best practices

Guidelines for students

- **Informed judgement**: critical evaluation of the feedback provided by AI tools
- **Engage critically**: treat AI as a tool for inquiry and scaffolding, not as a source of final answers
- **Validation**: validate AI-generated answers against other non-AI sources to ensure accuracy
- **Proofreading**: Generative AI should not be used to make material changes to work in draft, as proofreading one's own work is an essential academic skill
- **Accountability and transparency**: students are responsible for their own learning and should engage thoughtfully with AI feedback, using it as a tool to enhance their critical thinking and learning process
- **Data privacy**: input data may be used for AI training which may have privacy implications
- **Prompt crafting**: the quality of interaction with generative AI (like ChatGPT) depends heavily on the quality of the prompt.

Guidelines for educators

- **AI as a tool, not a replacement**: the most effective use of AI is to augment human teachers (empathy, context, and nuanced understanding), not replace them
- **Adopt hybrid feedback models**: educators should combine the efficiency of AI-generated feedback for low-stakes or routine tasks with human feedback for complex, higher-level assignments that require creative judgment and mentorship
- **Privacy and data security**: always check the privacy policy of any AI tool, especially concerning student data. Prefer tools that are compliant with regulations like GDPR
- **Critical evaluation**: teach students that AI feedback is not infallible. They must learn to critically evaluate the suggestions from an AI
- **Prompt crafting**: the quality of interaction with generative AI (like ChatGPT) depends heavily on the quality of the prompt. Teaching students how to craft effective prompts is a valuable skill in itself
- **Teach AI and reflective literacy**: integrate discussions on AI ethics, limitations, critical evaluation of its output. Prepares students to be both critical consumers and responsible co-creators with AI
- **Start small**: Beginning with low-stakes assessments and pilot programs before expanding to more significant evaluations allows for a controlled and measured approach to AI adoption.

Guidelines for institutions

- **Establish ethical frameworks**: form multidisciplinary oversight committees to develop clear and actionable guidelines for AI use (transparency, fairness, and accountability)
- **Ensure equitable access**: addressing the high implementation costs and resource disparities is critical to prevent AI from inflating existing inequities among students and schools
- **Mandate vendor transparency**: institutions must demand clear documentation from ed-tech vendors about their algorithms, the data used for training, and their privacy policies to ensure compliance with legal frameworks and ethical standards.

Ethical and implementation imperatives

- **Algorithmic bias and systemic inequity**: AI introduces algorithmic bias; **bias is not eliminated but rather relocated**; biases against non-native English speakers, or in adaptive learning software that systematically steers certain students toward easier material
- **Student privacy and data**: student work, which is considered **intellectual property**, and **personal information** may be used to train AI models without explicit consent – a clear breach of privacy. Dedicated, on-device processors and LLM for institutional/subject data processing offers a potential solution mitigating the risks associated with cloud-based platforms
- **Academic integrity**: AI tools challenges traditional notions of academic integrity by making it easier for students to generate **work that is not their own**. The solution is not to prohibit AI but to **re-engage with the core objectives of an assignment**. The focus must shift to fostering the **critical-thinking skills** necessary for students to assess the accuracy, source, and potential biases of AI outputs
- **Human-in-the-Loop**: AI should be a supplement, not a substitute, for the human educator. The most effective AI implementations treat the technology as a "**teacher's thought partner and assistant**" enabling educators to provide higher-level guidance while the AI handles routine tasks.

Hands-On: The Six Thinking Hats

Using AI for Feedback and Reflection in education – revisited

- White (facts and information)
- Red (emotions and feelings)
- Black (caution and risks)
- Yellow (positive aspects)
- Green (creativity and new ideas)
- Blue (process control)

AI Tools for feedback and reflection

AI Tools: general purpose

General purpose, on the cloud

- ChatGPT
- Google Gemini
- Deepseek
- Perplexity AI
- Claude
- Microsoft Copilot

General purpose, on your computer

- LM Studio
- Ollama

AI Tools: specialized education platforms

Open access

- **Riff**: Developed by the Institute of Design at Stanford University to sharpen reflective skills, Riff is an AI-powered chatbot that asks personalized and thought-provoking questions to guide students in a deeper reflection process
- **Microsoft Reflect** (in Teams for Education): A dedicated tool that uses AI to help educators create check-ins and polls to gauge students' emotional well-being and reflect on their learning process
- **Mentimeter + AI integrations**: Collects anonymous feedback and can summarize class responses for reflective discussion using some general purpose GenAI tool
- **Google’s AI in Google Classroom**: Suggests personalized resources and reflection prompts based on performance
- **Brisk Teaching**: This Chrome browser extension provides AI feedback on Google Docs, using rubrics and offering "glows" (strengths) and "grows" (areas for improvement).

AI Tools: specialized education platforms

Commercial products

- **Formative with Luna**: This is an all-in-one platform for real-time instruction and assessment, with its AI assistant, Luna, at its core. Luna can generate and edit various activities, digitize static PDF worksheets, and provide AI-powered scaffolds and hints to support students. The platform offers flexible feedback options, including audio, visual, and written feedback, and features dashboards that enable ongoing collaboration among teachers and track student progress.
- **Curipod**: This platform is designed for interactive, school lessons that prioritize student engagement and voice. Its AI provides rubric-aligned, real-time feedback that enables students to get feedback, reflect, and revise in a seamless process.
- **MagicSchool.ai**: This generative AI platform primarily focuses on saving teachers time with over 80 powerful tools. Its Writing Feedback tool allows educators to provide constructive, personalized feedback based on custom criteria, which enhances assessment and supports differentiated instruction. A notable and unique feature is the "Restorative Reflection" tool, which generates assignments based on restorative practices for disciplinary incidents, demonstrating AI's potential to support social-emotional development in the classroom

AI Tools: specialized education platforms

Commercial products

- **FeedbackFruits**: This tool offers "Automated Feedback" to provide instant, personalized reviews on technical aspects of academic writing, allowing instructors to focus on content-related feedback
- **HyperWrite's Reflection AI**: A specialized tool designed to generate insightful reflections based on provided information, useful for reflective essays or journal entries
- **Gradescope** (by Turnitin): AI-assisted grading that speeds up assessment and provides consistent feedback, especially in large classes
- **Seesaw** (with AI tagging): Helps students create digital portfolios, while AI organizes reflections and highlights growth patterns
- **Grammarly**, **Paperpal**, **Jenni**: These are AI-based writing assistants that help students refine their written work. Paperpal is valued for its academic focus, providing language suggestions that meet the high standards of academic publishing, which is a feature highly regarded by students and researchers alike.

Practicing AI for feedback and reflection

Practicing examples

Icebreaker: reflection prompt generator
- Tool: ChatGPT (or similar LLM)

Feedback at scale with AI grading
- Tool: Gradescope (Turnitin) or Google Classroom with AI plugins

Differentiation: the AI feedback assistant
- Tool: ChatGPT, Google Gemini or similar

Socratic reflection
- Tool: ChatGPT, Google Gemini or similar

Rubric generation
- Tool: ChatGPT, Google Gemini or similar

Group discussion: Pedagogy and Ethics
- Group discussion

Swift group diagnostic assessment
- Tool: ChatGPT, Google Gemini or similar, and Google Forms

Swift group diagnostic assessment

Tool: ChatGPT, Google Gemini or similar, and Google Forms

Exercise (20 min):

1. Task 1 (setup): Prepare a questionnaire in Google Form, or similar online survey tool, with one single question, for instance “What is the most challenging aspect of this subject for you?”.
2. Task 2 (gather feedback): Ask students/participants to answer the questionnaire at the first time you meet them and after briefing them on the subject/work to perform.
3. Task 3 (clustering): Download the responses and ask ChatGPT, or similar tool, to group them in clusters and to label each cluster with meaningful keywords.
4. Discussion: At the next time you meet the class, discuss with them their concerns and briefly explain how they will overcome them.

Learning outcome: Performing swift group diagnostic assessment with AI.



Icebreaker: reflection prompt generator

Hands-On

Tool: ChatGPT (or similar LLM)

Exercise (10 min):

1. In pairs, teachers input a PBL scenario (e.g., “students designing a sustainable city model”).
2. Ask ChatGPT to generate 3 reflection prompts for students.
3. Each pair shares which prompt they think would be most engaging for learners.

Learning outcome: Teachers see how AI can scaffold reflective questioning tailored to specific projects.

Feedback at scale with AI grading

Tool: Gradescope (Turnitin) or Google Classroom with AI plugins

Exercise (20 min):

1. Provide participants with a set of sample student solutions (e.g., a math problem or short essay).
2. Teachers use AI-assisted grading to apply a rubric and generate feedback.
3. Discuss how automated feedback compares with human feedback.

Learning outcome: Teachers see how AI saves time while keeping consistency and fairness.

Differentiation: the AI feedback assistant

Hands-On

Tool: ChatGPT, Google Gemini or similar

Exercise (15 min): To practice using AI to generate differentiated feedback on a single piece of student work.

1. Scenario: Provide all participants with the same short, mediocre student essay (e.g., on online/hybrid learning).
2. Task 1 (Struggling Student): Prompt: “Act as an instructional coach. Provide encouraging, specific feedback on this essay for a student who struggles with writing. Focus on one strength and one area for improvement related to organizing main ideas. Use a supportive tone.”
3. Task 2 (Advanced Student): Prompt: “Act as an advanced writing tutor. Provide feedback on this essay for a high-performing student. Challenge them to improve their thesis statement to be more nuanced and to integrate a counter-argument. Be direct and analytical.”
4. Discussion: In pairs, compare the AI's feedback for the two scenarios. Was it effectively differentiated? How could you, as the teacher, use this AI-generated text as a draft for your own final feedback?

Learning outcome: Critically use generative AI to create differentiated written feedback. This outcome targets both practical AI literacy (prompting, editing, ethical use) and assessment competence (designing constructive, differentiated feedback).

Socratic reflection

Hands-On

Tool: ChatGPT, Google Gemini or similar

Exercise (20 min):

1. Scenario: A student has just solved a math problem (provide a simple algebra problem and solution).
2. Task 1 (Bad Prompt): Ask the AI: “Did the student solve this problem correctly?” (It will just say "Yes").
3. Task 2 (Good Prompt): Participants must craft a prompt that makes the AI facilitate reflection. Example: “Your role is to help students reflect on their problem-solving process. Do not give answers. Here is a math problem and a student's solution. Generate 3 questions you could ask this student to help them explain their reasoning and think about whether their method would work for all similar problems.”
4. Discussion: Share the best prompts. How does this change the student's cognitive load? Why is asking questions more powerful for learning than just verifying an answer?

Learning outcome: Crafting prompts that force AI to ask questions instead of giving answers.

Rubric generator

Tool: ChatGPT (or similar LLM)

Exercise (10 min):

1. Scenario: You are teaching a 10th-grade history class and assigning a Document-Based Question (DBQ).
2. 2. Task 1 (the rubric): Prompt: “Generate a detailed, 4-point rubric for a high school history DBQ essay. Criteria should include: Thesis Statement, Document Analysis, Argument Development, and Outside Contextualization.”
3. 3. Task 2 (the exemplar): Prompt: “Using the rubric you just created, write a short introductory paragraph for a DBQ on the Civil War that would score a ‘4’ on the Thesis Statement and Document Analysis criteria.”
4. 4. Discussion: How useful is this AI-generated rubric as a starting point? What would you need to modify? How could showing students the AI-generated exemplar and then co-creating a rubric with them be a powerful activity?

Learning outcome: Use AI to create clear success criteria, a key part of the feedback cycle

Group discussion: Pedagogy and Ethics

Use these questions to guide a full-group discussion:

1. Bias and accuracy: We know AI can hallucinate and contain bias. How do we teach students to be critical consumers of AI feedback?
2. Privacy: What student data are we comfortable putting into a third-party AI tool? Why must we read the Terms of Service?
3. Equity: How do we ensure the use of AI feedback tools doesn't widen the digital divide? What alternatives exist for students without access?
4. The Human element: Where do you, the teacher, draw the line? What feedback must always come from a human? (e.g., feedback on creativity, empathy, personal encouragement).

Output: Co-create a classroom poster titled "Our guidelines for using AI feedback”.

Feedback and reflection on AI F&R

"3-2-1 Reflection"

Write:

- 3 things you have learned,
- 2 questions you still have,
- 1 thing you found interesting or surprising.



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