Over 60 adaptable lesson scenarios and practical activities for 21st century learners

MASTERING EDUCATION THROUGH AWARENESS

A Teacher's Guide for Cultivating Metacognition, Critical Thinking, and Reflective Learning

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The Why and How of Critical Thinking, Reflective Learning, and Metacognition

Did you know that teachers and educators are facing challenges due to the demands of our rapidly changing world? Of course! It's true!

We all know that the pandemic has brought to light and partially redefined the roles of teachers and students. The shifting of the paradigm of education from knowledge transmission to students' active engagement is already in progress. It also entails a lot of other changes, such as relying more on intrinsic motivation, working with students strengths, developing supportive relations, making students more responsible for their learning process, which directly impacts the way we conduct our classes and the way we assess our students' work.

However, as the process of changes is happening at an unprecedented scale and pace, even the most dedicated, experienced teachers are struggling with uncertainty of how to adapt or extend their teaching repertoire. That's you, isn't it?

Perhaps it makes sense then to refer to knowledge, research, and experience of others, for example international and public school educators. For example, us!

Who Are We?

Together we represent over 50 years of practical experience teaching English at middle school and high school levels. We absolutely love interacting with tweens and teens and even though we are from different schools in different countries, we love working together (mostly remotely). In fact,

we discovered that we've been working almost the same way with our students for at least a decade. *Which way,* you might ask? The M.E.T.A. way.

The M.E.T.A. Way

What's M.E.T.A.? In our guide book *Mastering Education Through Awareness,* besides being the acronym of the title, M.E.T.A. stands for **metacognition**, a fancy word that means thinking about thinking.

More precisely, it refers to the processes used to plan, monitor, and assess one's understanding and performance. Metacognition includes a critical awareness of a) one's thinking and learning and b) oneself as a thinker and learner. Read more below!

Spending some class time throughout the year to set up critical thinking and reflective learning is crucial. This isn't just about teaching your subject but about teaching students how to think about the learning of the subject.

When you dedicate time early on, you'll establish a foundation that will support all future learning. When you keep nurturing the skills, you'll imbue your students with foundations for lifelong learning. In this "Mastering Education Through Awareness" guide book, you'll receive The HOW and The WHY to help you support your students on their learning journey.

Today's world and the intensity of change in it affects so many areas of our lives. Education isn't immune to those changes; however, we still seem to be struggling with implementing the needed alterations and keeping up with the times. And even though we know the newest trends, we read various specialist books, we listen to TED talks and podcasts, we know that we need to implement innovative methodologies into our classrooms, in many cases – we actually DON'T.

WHY? Because it's too hard! Because it's not clear to us HOW TO DO IT!

The WHY

This is why we, Kasia and Beata, decided to share a decade of our practical knowledge and strategies that we have successfully implemented in two very different educational institutions with very different types of students. We want to share our knowledge and experiences because we're from different types of schools and from different countries, too. We know that teachers worldwide struggle with similar student issues.

And this is exactly what we bring to you in this publication: takeaways for your classroom from highflying educators. As dedicated, innovative practitioners, we believe in addressing your immediate classroom challenges. Who hasn't asked these questions, let them first cast a stone...

- *Why aren't my students learning?*
- *Do they find my subject boring?*
- *Why are there such problems communicating with them?*
- *What are they so anxious about?*
- *Why don't they take ownership of their learning?*
- *Do they know why they learn?*
- *Do they know how to learn?*

The answer to all these questions is **metacognition**.

The WHAT

So what is it?

Briefly, **metacognition** in the educational context is one's awareness and control over one's thinking of learning.

This can be further divided into **metacognitive knowledge** and **metacognitive regulation**.

"metacognition lies at the root of all learning"

"... self knowledge, awareness of how and why we think as we do, and the ability to adapt and learn, are critical to our survival as individuals..."

~ James Zull, (2011) From Brain to Mind: Using Neuroscience to Guide Change in Education

Metacognitive knowledge comprises:

1. **Declarative knowledge:** knowledge about how the brain and memory work, knowledge of different learning methods and strategies.
2. **Procedural knowledge:** Knowledge about how to implement different learning strategies.
3. **Conditional knowledge:** Knowing when and why we need to use different strategies.

Metacognitive regulation, in short, is the ability to plan, monitor, and evaluate one's own learning process (Guidelines for Teachers: Blended and Online learning Innovation Station).

Sounds awesome, you say, *and wouldn't it be grand if our students could actually do it!*

Yes, they can! And yes, we - their teachers, coaches, mentors, facilitators of learning - we can help them achieve it!

The Education Endowment Foundation, a pioneer institution researching metacognition, points out that students who practice metacognition exceed their peers by 7 months on average on their education journey. The Foundation also mentions the element of self-knowledge as a part and parcel of metacognitive skills, which is a very crucial component. When students find out where they are in the learning process and what to do to improve it, they also build their adaptability and resilience.

If your students are disinterested in learning in general, if they feel they're worth little or they're having difficulty identifying their goals or life passions, or struggle with even basic daily tasks, metacognition and reflective learning can provide a much needed positive boost in altering the learning mindset.
Teaching students to think metacognitively can also support young people worldwide in the current mental health crisis. That's great support!

Combined with **reflective learning, metacognition** is a very useful tool for developing the competence of **self-management,** as it refers to a set of skills and abilities that enable an individual to effectively regulate and control their own behavior, emotions, and thoughts in a way that fosters personal and professional growth. It involves several key components:

1. **Self-Awareness**: Understanding one's own emotions, strengths, weaknesses, values, and motivators. This includes being mindful of how these factors influence one's behavior and decisions.

2. **Emotional Regulation**: The ability to manage and respond to one's emotions in a healthy and productive manner. This includes staying calm under pressure, handling stress, and avoiding impulsive actions.

3. **Self-Motivation**: The ability to set personal goals, stay committed to achieving them, and maintain a positive attitude despite obstacles and setbacks. This includes using intrinsic motivation and maintaining drive plus energy to pursue long-term objectives.

4. **Time Management**: Effectively organizing and planning how to divide time between various activities. This includes prioritizing tasks, setting deadlines, and avoiding procrastination.

5. **Adaptability**: The ability to adjust one's approach or behavior in response to changing circumstances and new information. This includes being open to new ideas, learning from experiences, and being flexible in the face of change.

6. **Stress Management**: Recognizing the sources of stress in one's life and using strategies to manage it effectively. This can involve relaxation techniques, exercise, time off, and maintaining a healthy work-life balance.

7. **Self-Control**: The capacity to control one's impulses, emotions, and behaviors to achieve long-term goals. This involves resisting short-term temptations and delaying gratification for future benefits.

8. **Personal Accountability**: Taking responsibility for one's actions and decisions. This includes acknowledging mistakes, learning from them, and making amends when necessary.

9. **Goal Setting and Achievement**: The ability to set realistic, achievable goals and then systematically work towards accomplishing them. This includes planning, monitoring progress, and adjusting strategies as needed.

10. **Decision Making**: The ability to make informed and effective decisions. This involves evaluating options, considering potential outcomes, and taking action based on reasoned judgment.

Developing the self-management competence is essential for personal development, effective leadership, and professional success. It enables individuals to function autonomously, maintain productivity, and contribute positively to their personal and professional environments.

Advantages of Metacognition

In How People Learn, the National Academy of Sciences' synthesis of decades of research on the science of learning, one of the three key findings of this work is the effectiveness of a "'metacognitive' approach to instruction" (Bransford, Brown, & Cocking, 2000, p. 18). Some advantages of enhancing awareness of metacognition are:

✅ **Improved Learning Outcomes:** When students understand their learning processes, they can adjust their strategies to be more effective. For instance, if a student knows they learn better through visual aids, they can seek out diagrams or charts to help them grasp complex concepts.

✅ **Increased Independence:** Metacognition encourages students to take charge of their learning. Instead of relying solely on you, they start to identify and use resources and strategies that work for them. This independence is crucial for success both in and out of the classroom.

✅ **Better Problem-Solving Skills:** Reflective learners are better problem solvers. They approach problems methodically, breaking them down into manageable parts and evaluating possible solutions. This skill is invaluable not just in academics but in everyday life.

✅ **Enhanced Critical Thinking:** Critical thinking and metacognition go hand in hand. By reflecting on their thought processes, students develop a deeper understanding and are more likely to question assumptions and consider multiple perspectives.

Both teachers and students gain from implementing critical thinking, reflective learning and metacognition.

Our **M.E.T.A.: Mastering Education Through Awareness - A Teacher's Guide for Cultivating Metacognition, Critical Thinking, and Reflective Learning** guidebook will show you how and why implementing these transversal skills empowers us all.

All of our lesson scenarios, suggested for implementation into your lessons at various times of the school year, support the development of these competences: self management, resilience and adaptability, as well as teamwork and emotional intelligence.

In the title of our publication we also refer to **critical thinking**. We do that meaning two things: critical thinking as conscious examination of what the obvious may seem to be, with a view to improving the learning process. This refers to students' asking themselves **metacognitive questions**, asked at three different **stages of the learning process** to improve its effectiveness. We also make reference to **critical thinking** as an example of important **transversal competences**.

Metacognition and **reflective learning** turn students into aware, responsible and knowledgeable learners, which has the potential of turning them into successful life-long learners. The stakes are really high!!

You might think "easier said than done" and of course it will take time. But… if you know **The WHY** and **The HOW**, you can embark on this exciting journey together with your students.

Come join us in learning **The WHYs and The HOWs.** Especially **The HOWs!**

The HOW

Each chapter of the guide contains a brief introduction to the main topic, with a focus on **WHY** it makes sense to us to introduce to our students and then nurture this skill or competence. This introductory part is followed by **The HOW** section, in which we present to you a number of **scenarios** to include in your lesson planning.

The 14 Chapters will take you on a metacognitive journey in a logical order:

1. Why Introduce Critical Thinking, Reflective Learning, and Metacognition?
2. The roles of teachers and students.
3. Motivation and inspiration.
4. Shift focus to students' strengths.
5. The art of questioning.
6. The learning process: the brain.
7. Metacognitive strategies: goal setting.
8. Metacognitive strategies: monitoring.
9. The role of mistakes and growth mindset.
10. Metacognitive strategies: evaluating.
11. Metacognitive feedback.
12. Employability.
13. Adaptability for life-long learning.
14. The whole-school approach.

The lesson scenarios proposed by us DO NOT replace or interfere with any curriculum of any subject matter! They are meant to provide you with **support** and **guidance** to implement Critical Thinking, Reflective Learning, and Metacognition.

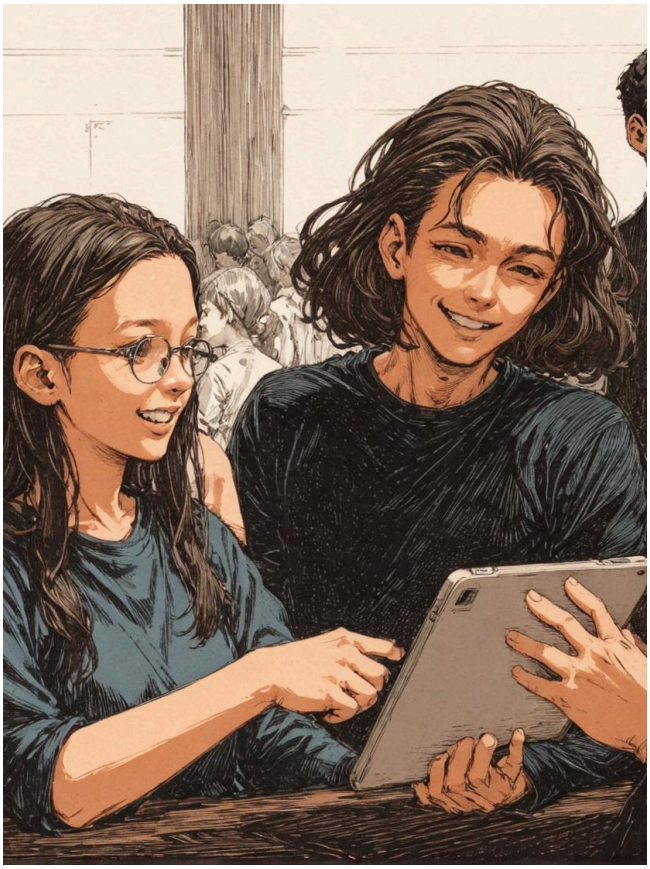
TIME FRAMES: Some lesson scenarios are as short as 5 minutes, easily inserted into any lesson, and others may constitute a whole 45-minute lesson plan or even spread over two class periods. Most scenarios are between 15 to 35 minutes long, with options to shorten or extend them as the need arises or the tasks unfold. It all depends on the students you encounter in your class each year: some work faster than others and some take their time. We know how it is - that's why our scenarios are flexible!

PRACTICAL TIPS: Each scenario comes with **practical tips** from our experience, as well as **high-tech / low-tech / no-tech options** whenever possible. We're aware

that some schools in some countries still struggle with access to reliable wifi or the number of available devices. Many scenarios take this into account.

ADAPTATION: While our example scenarios cover a range of school subjects, they are adaptable to any subject or topic at the middle or high school level. If you teach at an 8-class elementary school, these scenarios can also be useful for grades 6-7-8. Adapting them for the lower elementary grades might require more tweaking, but many of the scenarios can still serve as valuable inspiration for elementary school teachers.

The chapters are arranged in a particular sequence and to fully benefit from the guide, we encourage you to stay with us throughout the sequence. Afterward, feel free to use your favorite lesson scenarios in any sequence you prefer. You can implement or adapt them as needed to achieve the best results in your learning environment, with your students, and within the framework of your curriculum.



Our goal is to provide you with a flexible toolkit that can be tailored to meet your unique needs. We believe that with a little creativity and customization, these scenarios will enhance your teaching practice and support your students' success.

Ready to begin this exciting educational adventure with us?

Great! Let's get started right away, the M.E.T.A. way!

Chapter 1

Why Introduce Critical Thinking, Reflective Learning, and Metacognition?

crit·i·cal think·ing

noun

the objective analysis and evaluation of an issue in order to form a judgment.

(long version by www.criticalthinking.org : **Critical thinking** is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness.)

re·flec·tive learn·ing

Reflective learning is a form of education in which the student reflects upon their learning experiences. (wikipedia.org)

met·a·cog ni·tion

noun

awareness and understanding of one's own thought processes.

Let's examine the WHY

I'm busy covering my curriculum! Why invest time?

In recent years, we can observe a multi-generational decline in learning capabilities and reading comprehension. Overall, we read less, retain less of what we read, and generally avoid critical analysis because it's too hard to engage in it.

Why has this been happening? In the age of bite-sized content and viral media, many are losing focus and patience for lengthy, complex texts. We skim and scan instead of closely reading. And some don't even do that! The attention spans have shrunk to mere seconds. While technology has enabled wide access and distribution of information, it has also led to fragmentation of our thinking.

Has this affected our students? Definitely! Regardless of grade level, class size, or core curriculum, private school or public, educators worldwide are dealing with young people who are growing up in this bite-sized TikTok and Instagram/Facebook culture, and no matter how many bans on phones we apply at school, they will find a way to access and enjoy that content. Often learning on these platforms, too!

But what today's students need most (and will not receive from most online content they interact with, that's including educational content!) is the ability:

- 👉 to keep learning and keep adapting to stay ahead of the career or workforce game;
- 👉 to discern which information is correct and which isn't, whether it's biased and if so, how and why;
- 👉 to judge which information will be valuable in their lives, therefore requiring more learning.

In other words, to become self-directed, adaptable lifelong learners, tweens and teens need to learn how to think critically and learn reflectively, constantly assessing their progress and adjusting their learning strategies.

Yes, we as educators know this, we read the papers and watch the news. We're aware of the Future Jobs Report and the new OECD list of essential skills for 2030 adjusted to the current needs of the job market. We sense that education, stagnant for decades, needs a revolutionary change.

What could this change look like?

Two necessary steps are:

A/ shifting focus towards developing students' thinking skills through critical appraisal of problems or tasks at hand

B/ introducing reflection upon the learning process: before, during and after the task.

Why are these steps super important? Because this paradigm shift will help develop the ability to discern the *yin* and *yang* of life: views and perspectives, similarities and differences, connections and disconnections. This paradigm shift will help nurture **critical thinking skills** essential for success in learning. In addition, **reflective learning** will support the development of **metacognition**.

A Teacher's Dilemma

Your Question: "My students don't seem to know why they are learning in the first place. They seem completely disinterested in learning anything. What can I do?"

Our Answer: "Encourage metacognition by helping students understand their learning processes. There are many strategies you can incorporate, and you'll learn them in the next chapters. These strategies will guide you towards helping your students embrace learning as a life skill. By understanding the "why" and "how" of their learning, students will be more likely to stay engaged and motivated."

Let's sum it up!

✅ Establishing critical thinking and reflective learning from the start in your classroom creates a foundation for a more engaging, effective, and self-sufficient learning environment.

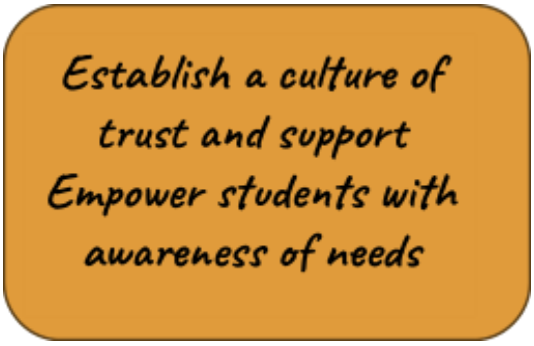
✅ Metacognition enables students to take charge of their learning, resulting in improved outcomes and a deeper grasp of the material. Let's keep in mind that not only WHAT students learn is important, but HOW!

So… let's check out the HOW behind the WHY…

Let’s examine the HOW

Empowering students with awareness of needs.

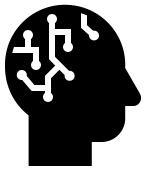
Regardless of the subject or grade level you teach, each year on Day 1 you face a new group of students, who either know each other or don’t, who have already fostered friendships or not, who are eager to learn together or not. It makes sense to provide yourself and the students some time to get to know each other and most of all, to establish a culture of trust and support for each other’s learning. Students also need to know the WHY - why are we changing things up? Why are WE now in the center of attention? Why are WE the STUDENTS now - “all of a sudden” for many of them - “burdened” with the learning?



Let’s first empower the students with AWARENESS of the skills they need to develop during the time they’re at school.

Remember what we said earlier? When we talk about metacognition, we're focusing on how students can become aware of their own learning processes. Through this awareness, they will start to ask themselves questions like, "How do I learn best?" and "What strategies help me understand this topic?"

Here is a scenario to incorporate into your classroom practice – in fact, it can be adapted and implemented to any subject or grade level you teach. It’s best introduced at the beginning of the school year, so you lay the foundations for the whole year’s learning processes. Gradually, your students will learn to ask themselves these important questions on their own. But first… well, we’ve got to start somewhere, right?



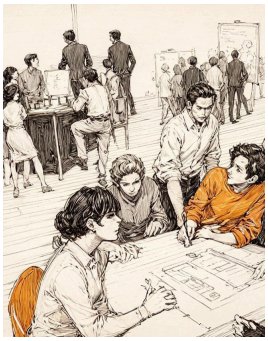
THE HOW #1 - building knowledge and raising awareness of the needed skills (20 or 35 minute versions)

1/ Divide students into groups of 4-5 and provide them with a printed copy of the skills for 2030.

Use **this page** or download **this chart** (or use your own list/diagram)

2/ **TASK #1:** Ask groups to pick one skill (or 2-3 skills, depending on your class size) so all skills from the page/chart are distributed for group discussion (if you wish you may leave one for general discussion at the end)

3/ **TASK #2:** Give students 5-10 minutes to brainstorm **WHY** they think they should learn these skills and make a list. If any concepts need explaining, ask students to figure it out - use a dictionary app, Google or ChatGPT.



3/ PRACTICAL TIP: If phones/laptops are unavailable, use paper dictionaries/ encyclopedias for basic definitions, or prepare them on flash cards ahead of time.

4/ Jigsaw the groups. **TASK #3**: In 5-10 minutes compare the lists and generate a combined list of reasons to develop them

4/ PRACTICAL TIP: to **JIGSAW**, label the students with 1234 & ABCD numbers, then regroup so each new group has 1 rep from each original group. Double up students if needed, but ensure each group covers every skill.

5/ **TASK #4:** Open a 5-10 minute general discussion on the reasons to provide students with a voice. Guide them towards thinking WHO is responsible for the development of these skills and HOW they can begin and continue the process.

5/ PRACTICAL TIP: Discussion will help you identify students with great communication skills and already established confidence. These students will need an occasional boost. Your focus will primarily be on those who do not participate in this discussion (but may speak in smaller groups; therefore, circulate among them to take notes while they collaborate on tasks #2, 3, 4.)

That's 20 minutes (if you choose the 5 minute options for each task).

If you wish and have additional 15 minutes (or do it on another day), continue with tasks #5, 6 and 6:

6/ Give students 5-10 minutes to complete **TASK #4:** Brainstorm HOW can they learn these skills in THIS classroom, THIS subject, THIS grade level.

7/ Jigsaw the groups. **TASK #5**: In 5 minutes compare the lists and generate a combined list of ways to develop the skills and practice them.

6/ PRACTICAL TIP: Start with the regrouped teams and jigsaw them differently for the next step. This allows students to collaborate with a larger number of students and get to know them while preparing a task. Circulate among the groups and take notes of students' engagement, teamwork and leadership skills, etc. Begin building a portfolio of the student, which will come in handy during parent-teacher-student conferences.)

8/ **TASK #6:** Open a 5-10 minute general discussion on the reasons to provide students with a voice. Guide them towards thinking WHO is responsible for the development of these skills and WHEN they can begin the process.

That's 35 minutes (if you choose the 5 minute options).

REFLECTION ON LEARNING:

Ask students to ponder this statement: *"In the next 20 years, we will be required to handle new and unusual duties as computers and AI will be able to handle the routine tasks. We must constantly learn new skills and stay current with our changing environment to do this*." and answer the questions on a sticky note (or piece of paper) which they hand over to the teacher as an EXIT TICKET.

Q1: How do you feel about the statement in regards to this class/subject matter?

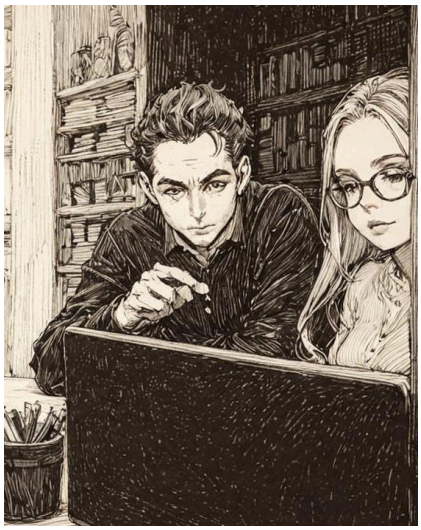
Q2: How do you feel about today's tasks and activities?

REFLECTION PRACTICAL TIP: Collect the **EXIT TICKETS** and make use of the information. Prepare a Google spreadsheet on which you'll be gathering essential information on each student (engagement, confidence, etc). Alternatively, set up a paper folder or designate a plastic sleeve in a large plastic file to gather this information. It is invaluable during parent or student-parent-teacher conferences as evidence of attitude and progress made along the year.

Next, let's help the students understand the shift of focus from "mere delivery of knowledge" by the teacher, a common misconception slowly undergoing change in some schools and countries. Students need to understand that "self-driven learning" or "take ownership of my learning" does not mean "we can do what we want as we're in charge." The tasks of monitoring learning or assessment of what has been learned are not going away!

However, involving students in these tasks will constitute an important change in the learning process. We will discuss the HOWs in further chapters; here in this brief introduction, we want to focus on the shift towards developing students' thinking skills and reflection upon the learning process: before, during and after the task.

THE HOW #2 - introduction to developing thinking skills and reflective learning (15 - 25 minute versions)



Teaching Mathematics, for example, can be a challenge to educators, mainly because they must deal with learners' varying levels of readiness, regardless of the grade level. Some of the factors attributing to this challenge are: learners' perceptions of mathematics, their previous learning experiences, and their fear of failure. You can incorporate this scenario in one of your first lessons, adapting it to the subject you teach. It aims to facilitate student ownership of learning through active peer involvement and flexibility with assessments.

1/ Divide students into pairs. Depending on the grade level of your class or course, choose a mathematical concept that is at least 1-2 levels lower than the current (assumed) knowledge of math concepts.

2/ **TASK #1 (5-10 minutes)** In pairs, students think of a creative explanation of the concept to someone younger than they are. Encourage them to write it, draw it, film it, or use manipulatives of any kind. The point is to end up with explanations in different media forms.

2/ PRACTICAL TIP: You can prepare this scenario earlier by collecting the needed materials and manipulatives for your chosen concept. High-tech option could include Google tools, while low- or no-tech options need markers and A4 or poster paper.

3/ **TASK #2 (5-10 minutes):** Arrange students into groups of 4, ensuring that each person in the group comes from a different pair. Taking turns, students present their explanations to each other.

4/ **TASK #3 (5-10 minutes):** Ask students to reflect on their learning by asking the following questions:

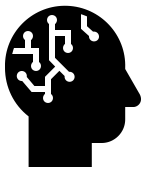
- *Which explanations were the most effective? Why?*
- *Which of the presented explanations worked best for you personally? Why?*
- *What criteria would you use to assess the presentation that worked for you? Why?*
- *How would you arrange the assessment criteria to score all of the presentations, given that they differ so much?*
- *How easy/difficult was it to explain the concept for you? Why?*

4/ PRACTICAL TIP: Guide the students towards conclusions that what works best for them/is easy/difficult for them doesn't necessarily work best/ is easy/difficult for others. We're all different. Help them focus on their perception of mathematics (or the subject you teach) and that when broken down into steps or explained in an effective way, the math becomes clearer, more accessible.

To become better learners, students need a change of perception. Help them change their thoughts about learning your subject by using affirmations. For example, 'Math is easy' - and they repeat it every day like a dose of medicine (5 tablets = say it 5 times), morning, afternoon, and evening. Why? Because affirmations are medicine to bring a change or at least support the process of change.

Teaching students how to use critical thinking skills and reflective learning skills on a daily basis leads to a deeper understanding of lifelong learning, crucial in today's digital world that keeps evolving and innovating on a daily basis.

The HOW #3 scenario can be implemented at any time during the school year when you feel your students, overwhelmed or dejected, are losing touch with their learning.



THE HOW #3 - introduction to connecting thinking skills and reflective learning with lifelong learning (10-20 minutes)

1/ **TASK #1 (2-3 minutes):** Ask students to think:

a/ why are transversal skills called transversal?

b/ why are they so important these days?

1/ PRACTICAL TIP: Lead the students towards root words in the word *transversal* - "trans" and "vers" as in "versatility." Another word that is often used is "transferable" or "universal" skills. Guide students towards the unpredictability of future job markets beyond 2030 (dozens of today's professions and jobs did not exist even 5 years ago)

2/ **TASK #2 (5-10 minutes):** Put students into 4 groups and ask them to make a list of ways that transversal skills such as critical thinking, stress management, self-motivation and adaptability are important in one of these professions:

Business: Financial Managers
Technology: Software Engineers
Medicine: Surgeons
Arts: Creative Directors

2/ PRACTICAL TIP: Depending on the time you wish to spend on this task, you can ask students to make a short bullet point list or an elaborate, detailed presentation. Circulate and observe the cooperation and collaboration in the groups, taking notes for future reference and reflection on pre-set group composition.

3/ **TASK #3:** Open a 3-5 minute discussion and ask students to reflect on the universality and importance of these skills. Guide them towards thinking how they could obtain and hone these skills in your class and/or your subject area.

3/ PRACTICAL TIP: Guide the reflective discussion towards connecting the critical thinking skills and reflective learning with lifelong learning skills, upscaling credentials to change jobs or pursue a career.

These scenarios truly empower the students with AWARENESS of the skills they need to develop, often convincing them to roll up their sleeves and put in a genuine effort.

What's in it for me?

Teacher's reflection and notes for future use.

I applied The HOW # __ in my _____ class.

What went well 😃	What could have worked better 🙂
Questions for me/myself: Questions for/from students:	
The moment to cherish:	

Chapter 6

The Learning Process: The Brain

learn·ing

noun

1. the acquisition of knowledge or skills through experience, study, or by being taught. "these children experienced difficulties in learning"
2. knowledge acquired through experience, study, or being taught.
3. a thing learned by experience; a lesson. (languages.oup.com)

proc·ess

noun

a series of actions or steps taken in order to achieve a particular end. (languages.oup.com)

brain

noun

1. an organ of soft nervous tissue contained in the skull of vertebrates, functioning as the coordinating center of sensation and intellectual and nervous activity.
2. intellectual capacity. (languages.oup.com)

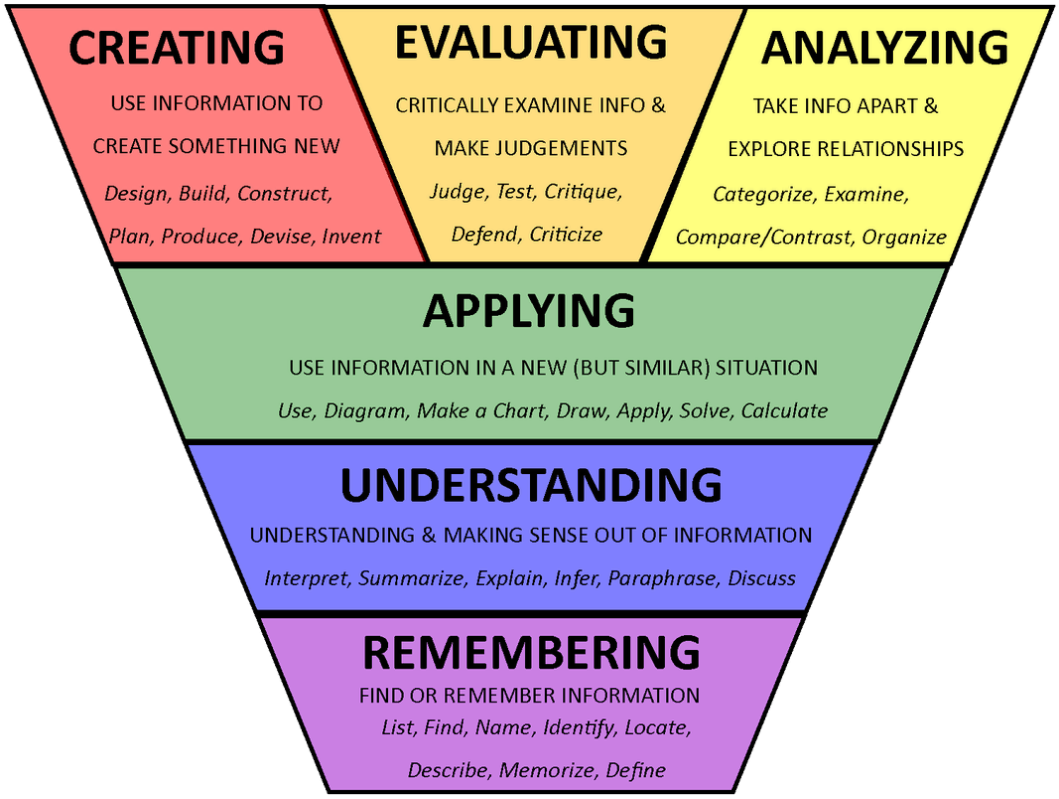
Let's examine the WHY

How does our brain work and why do we need to know it?

In order to teach metacognitive skills and enable students to check where they are in their learning process, they need to understand the basics of how the brain learns and remembers. That's why we need to explain it to them, probably just plainly…

There are two types of memory: working and long-term. Working memory can hold only 4-7 items, so in reality learning too much at one go is impossible due to "cognitive overload."

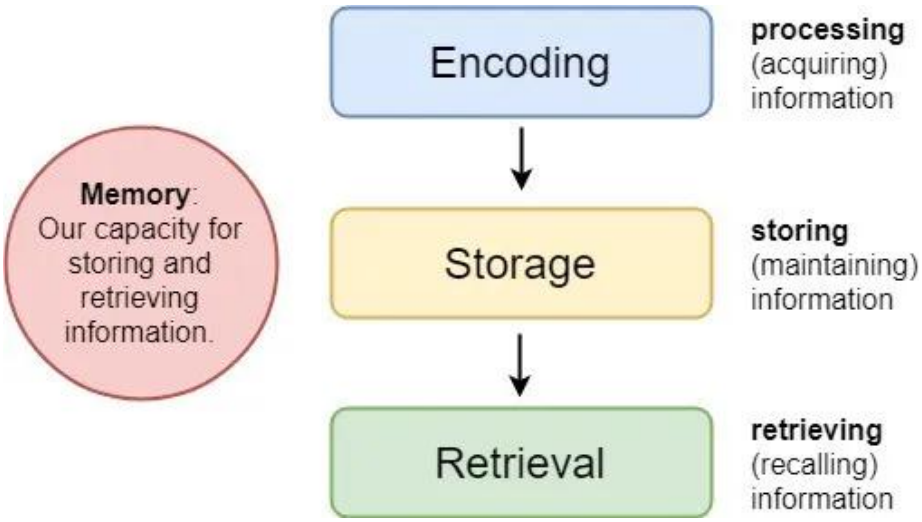
To learn something means to be able to retrieve knowledge and skills from long-term memory (books closed!) in order to see different options and solve problems. A proficient learner has a pretty long way to go while moving along Bloom's taxonomy from remembering, through understanding, applying, analyzing to evaluation and creation. So an effective learning process has to be divided into stages of learning with an information load of appropriate difficulty and size.



What is the learning process?

The learning process consists of three stages - **encoding → storage → retrieval.** Moving the information from working memory to long-term memory takes time and requires appropriate teaching and learning strategies such as **interleaving** (mixing different types of problems/ information) and **spaced repetition** (performing repetition at intervals). Time is also needed for consolidation of memory; here, sleep and physical activity play an important role. So an effective learning process has to be divided into stages of learning with an information load of appropriate number and good quality of retrieval sessions.

👉**Encoding** is the input of information into the memory system.
👉**Storage** is the retention of the encoded information.
👉**Retrieval** is getting the information out of the memory and into awareness.



SOURCE: https://senecalearning.com/en-GB/blog/introduction-to-the-neuroscience-of-learning/

What are the most common learning strategies?

Research shows that the most common learning strategies are **rereading** the notes or chapters from books (achieving familiarity of a given text with understanding and knowing what is written) and **doing only one type of these exercises**. Both strategies are in fact the most **ineffective** types of learning strategies, sometimes called **illusions of learning.** (Make It Stick.)

So HOW can we help students broaden their scope of learning strategies?

Let's examine the HOW

Basics of how the brain works.

In order to help students become aware of their learning process and be able to monitor it, they need to understand the basics of how the brain learns and remembers.

Here's a short lesson scenario to help empower your students.

THE HOW #1 - building knowledge of how the brain learns and remembers (20 or 35 minute versions)

1/ **TASK #1 (5 - 10 minutes):** Divide students into groups of 3-5 and ask them to discuss the following questions:

a. *How often do you study hard and don't get a satisfactory mark?*
b. *How do you study? What exactly do you do?*
c. *How long before a test do you begin studying?*
d. *How do you actually know that you have learnt something?*

2/ Each group writes down their information in a chart of their choice to share as group rep.

2/ PRACTICAL TIP: For a low-tech/no-tech option, use A4 paper or larger. Tech option can use a shared Google doc on laptops or shared note on phones.

3/ **TASK #2 (5-10 minutes):** Re-mix the groups to exchange information (jigsaw groups A,B,C,D have a rep from the initial group 1,2,3,4 etc) and briefly discuss their findings.

Chapter 8

Metacognitive strategies: monitoring

mo·ni·tor·ing

verb - gerund or present participle

observe and check the progress or quality of (something) over a period of time; keep under systematic review (languages.oup.com)

Let’s examine the WHY

Monitoring: metacognitive questions

Monitoring one’s progress during the learning process is the second metacognitive stage. It involves regularly evaluating one’s understanding and performance to identify areas that need improvement. Which means, of course, asking questions, which is an extremely important stage of the learning process! The specificity of metacognitive questions for monitoring may be dependent on the subject and instruction, but it’s also possible to **ask broader, metacognitive questions** that we can treat as universal.

These questions include:

1. Am I doing well?
2. Am I satisfied with the result?
3. Should I approach the task differently?
4. Who can I ask for help?
5. Should I change my strategies?
6. How or what might help me?

What does this mean?

Monitoring progress during learning is a crucial metacognitive stage. Broader, universal questions help in this process, regardless of the subject. These questions may aid students with assessing their performance or satisfaction with results. They may also lead to considering different approaches or strategies, and identifying potential improvements. This **reflective practice** enables learners to stay alert and make necessary adjustments, enhancing their effectiveness and success.

Why should students monitor their goals?

Students should regularly assess their learning process to stay aligned with their goals, pinpoint areas needing improvement, and adjust their strategies for better results. This constant self-evaluation improves comprehension, increases motivation, and promotes self-regulation, leading to **more effective** and **efficient learning**. Tracking progress helps students remain engaged and take ownership of their educational journey.

Metacognitive strategies: monitoring - teacher's self talk

Teacher's modeling is one of the most effective methods for teaching metacognitive monitoring, especially at the start of the learning process. By verbalizing their thought processes, teachers can demonstrate how to plan, monitor, and evaluate one's own learning. This practice helps students understand how to apply these strategies to their own work. Over time, students learn to internalize these metacognitive skills, becoming more self-aware, independent learners capable of effectively managing their own learning processes.

Metacognitive strategies: monitoring - retrieval practice

So the most essential question is *how do I know that I am progressing?* As it has already been mentioned (in Chapter 6 on how the brain learns and remembers): when you can retrieve information from memory and can apply it in different contexts, you're making good progress. Students need to be aware of this and periodically check whether they are able to not just recall information but effectively apply it as well.

Let's sum it up!

✅ Teaching students how to monitor their progress is a vital aspect of metacognition. Universal questions, such as evaluating performance, gaining satisfaction, adapting methods, and refining strategies, support this reflective process.

✅ This process enables learners to make effective adjustments and leads to better learning outcomes. An example of successful progress in learning and memory retention is retrieval practice, where information is recalled and applied across various contexts. The strategies can be customized by subject and individual teaching methods.

So… let's check out HOW we can empower our students in this stage of learning…

Let’s examine the HOW

Let’s empower the students with AWARENESS that others do it, too!

By understanding that their peers and teachers also ask metacognitive questions, students can feel more confident and motivated to do the same. This shared practice fosters a supportive learning environment in which everyone actively reflects on their thinking and learning processes, enhancing overall educational outcomes.

THE HOW #1 - building knowledge and raising awareness of the needed skill through modeling (5-10 minutes)

You can adapt this scenario to any subject taught at your school.

1/ Present a sample task, for example in chemistry “Balancing chemical equations," or any other task depending on the subject you teach.

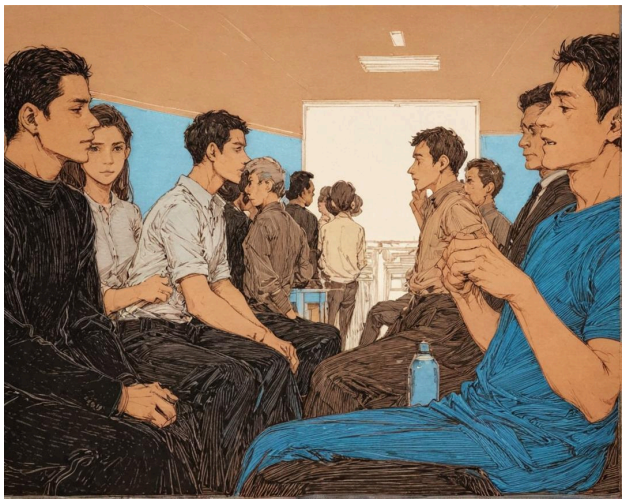
2/ **TASK #1 (3-5 minutes)** Apply **Teacher's Self-Talk** by demonstrating using metacognitive questions by thinking aloud **during** the completion of the task: for example:

- **During the Task:**
  - *Am I following the steps correctly to balance these equations?*
  - *Am I getting stuck on any particular part?*
  - *Do I need to try a different strategy if I keep making the same mistake?*
  - *How can I check my work to ensure accuracy?*

3/ **TASK #2 (2 minutes):** Ask students to formulate ONE other metacognitive question that will help monitor the goals that they have set for themselves (or ones that have been set by the teacher.).

3 & 4/ PRACTICAL TIP: Provide students with a sticky note or scraps of paper to write down their formulated questions.

Sharing their questions may be done in a number of ways, depending on class size and the teacher’s preference for pairs or groups.



In the "divide & slide" exercise, students can be sitting or standing in 2 rows.

For example, employ the **DIVIDE & SLIDE** technique to share the questions: arrange students in 2 rows facing each other, use a gong, whistle or visible timer to measure out 30-second intervals, and ask students to share the questions, commenting on them as well within the given 30-second frame. Students move 1 person up/down one row and present their questions again to each other. Repeat as many times as you have students in the row.

ALTERNATIVELY: use the **INSIDE-OUTSIDE CIRCLES** technique. Arrange students in two circles sitting down or standing facing each other. Students exchange questions and/or comments and then students in the outer or inner circle move 1 spot left or right. Repeat as many times as needed.

4/ **TASK #3 (3-5 minutes):** Share the formulated questions and briefly discuss the effect of asking such questions.

Let's empower the students with MONITORING skills!

Retrieval practice is about recalling information from memory (books closed!) to strengthen memory traces and move information from working to long-term memory. There are several effective retrieval tools that your students can use to monitor their learning process (and then adapt these learning strategies effectively in the third stage of the metacognitive process; see Chapter 9).

If we mix types of information from different subject areas and perform retrieval over periods of time, we use **spaced repetition** which is helpful in solidifying knowledge and skills at higher stages of the learning process.

Retrieval Practice tools include:

- mini-quizzes
- power tickets: *What have I learnt today?*
- brain dumps: writing down what students remember about a problem, after reading a text, etc.

Chapter 12

Real-World Relevance - Employability

real·world re·le·vance

Real-world relevance as a principle of learning can be defined as the application of knowledge and skills in **real-life situations**, beyond the confines of controlled environments such as classrooms or laboratories. (educationadvanced.com)

em·ploy·a·bi·li·ty

noun

the skills and abilities that allow you to be employed (dictionary.cambridge.org)

trans·ver·sal skills

transversal skills are typically considered as not specifically related to a particular job, task, academic discipline or area of knowledge and that can be used in a wide variety of situations and work settings (for example, organizational skills). (https://unevoc.unesco.org)

Let’s examine the WHY

Focus on developing Critical Thinking skills

When students are encouraged to think through problems on their own or guided by their curiosity, they develop stronger **critical thinking** and **problem-solving skills**. In genuine learning environments, students help steer the direction of classroom activities, which boosts their **motivation** to explore, research, and find answers independently.

This approach, known as **inquiry-based learning**, allows students to naturally acquire knowledge both in and out of the classroom. It creates an authentic learning experience that makes learning more enjoyable and exciting, helping them understand and apply information in the real world.

Connect lessons to real-world issues

Many students find it helpful to relate what they learn from teachers and peers to current events, whether it's the latest news, scientific discoveries, community activities and events, or other developments. If teachers notice that and **connect** their subject matter to these **real-world issues**, this may help students develop unique perspectives and even spark a greater interest in the content of the course.

Exploring these real-world problems through films, books, and realistic scenarios is a great way to engage students and make them more emotionally invested in both their education and the world around them; true that! But does this “automatically” happen when we show students a film or describe a realistic scenario?

Maybe not yet…

Include transversal skills in your lessons

Transversal skills are becoming more essential for learners to adapt successfully to changes and lead meaningful, productive lives. Although they are not specifically related to a particular job, task, academic discipline, or area of knowledge, nowadays they are

vital in a wide variety of life situations and work settings. Some examples of these transversal skills include:

👍 **Critical and innovative thinking**
👍 **Interpersonal skills** (such as presentation and communication skills, organizational skills, teamwork, etc.)
👍 **Intrapersonal skills** (for instance, self-discipline, enthusiasm, perseverance, self-motivation, etc.)
👍 **Global citizenship** (for example, tolerance, openness, respect for diversity, intercultural understanding, etc.)
👍 **Media and information literacy,** such as the ability to locate and access information, as well as to analyze and evaluate media content.

No matter what subject or grade level you teach, these five groups of transversal skills can be incorporated into your lessons, and probably already are.

However, are your students AWARE of them? Are your students aware of their importance for their future careers and employability? Maybe not yet…

Employability in the 2nd quarter of the 21st century

😳The first quarter of the century is almost over! 🤔Enter a new era of further development of technology, global issues galore, and an even larger population to compete with for jobs. So let's think, how are our current students equipped to navigate complex work environments, collaborate effectively, and continuously learn and innovate in their future workplaces?

Our high school students will join the job market in 2025-2028 if they don't pursue college degrees and 2028-2031 if they do. Add a master's degree and we're into 2030-2033. And what can change in those 8 years?

Do we remember when YouTube was launched in 2005, how it changed the world? What about Facebook and Twitter in 2006? WhatsApp in 2009? Messenger in 2011 and Telegram in 2013? And how is ChatGPT, launched only in 2022, changing our current state of affairs?

Between 2005 and 2024, in just 19 years, thousands of apps were developed; some thrived, some survived, some vanished after a while. And we adapted to them, embraced some of them, and even got addicted to a few. The rapid shrinking of the

half-life of knowledge (see links in bibliography for latest articles) since the middle of the last century, coupled with the exponentially doubling of knowledge nowadays (every 12 hours!) may cause an overload that makes people unable to process it anymore.

Famous Quotes

The 2023 scientific study by H.Tushar and N. Sooraksa indicates that "problem-solving, communication, teamwork, adaptability, and willingness to learn [are] among the most commonly reported skills over time. The study found a **mismatch between employers' expectations and graduates' possessed skills**. The study's findings can also help educators and employers to better align their efforts to prepare students for the modern workplace." (www.sciencedirect.com)

And this is why it's vital that our current students are equipped with skills that can help them forge ahead, continuously learn, and forever upskill or adapt in their future workplaces. Workplaces that don't even exist right now.
We know that students must acquire educational skills like proficiency in STEM subjects, digital literacy, and a strong foundation in languages and humanities.

We know that transversal skills, such as critical thinking, problem-solving, communication, and adaptability, are equally important. We know that cultural awareness and emotional intelligence also prepare students for globalized workplaces. We know that fostering these abilities we can equip students with the tools needed to thrive in today's ever-evolving job market. We know that. But HOW?

A Teacher's Dilemma

Your Question: "Some of my students are disengaged and disinterested in learning. How do I make them aware that they'll have a hard time getting jobs in the future?"

Our Answer: "Engaging students and making them aware of the importance of their education for future employability can be challenging, but it's crucial. Introducing metacognition may help encourage your students to think about how they are learning and why they need these transversal skills to enhance their chances for employability when they finish high school or college. Setting goals, mapping out a path to reach the goals, and taking baby steps to get started are some of the possible strategies."

Let's sum it up!

✅ Focusing on **developing critical thinking skills, connecting lessons to real-world issues,** and **including transversal skills** in your lessons will definitely help your students grasp the importance of preparing themselves for their future workplace, coping with a volatile employment market, or running their own business.

✅Set up cultivating critical thinking and reflective learning early, and you'll soon enjoy lessons with more engaged and more independent learners.

So now… let's check out the HOW behind the WHY…

Let's examine the HOW

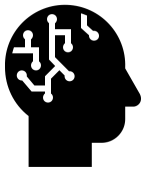
Develop critical thinking, connect to real-world issues, AND include transversal skills?

Isn't it too much? Isn't it too difficult?

As educators, we're often overwhelmed by the vastness of the job. What ELSE can we take on? But in reality, most of us are able to multitask pretty well. Especially when designing our lessons, we're experts.

So no need to stress out, you're ALREADY doing a lot of what's needed.

Don't believe us? Check this out!



THE HOW #1 - application of transversal skills (70 minute version)

Here's an example lesson plan for a chemistry class. Let's pick a current topic, **a real-life issue: The Chemistry of Climate Change.**

Objective: Students will understand the chemical principles behind climate change, develop critical thinking skills by analyzing data and evaluating sources, and connect their learning to real-world issues. They will also practice transversal skills such as **collaboration**, **communication**, and **problem-solving**.

Yes - all three can be incorporated into the lesson. **Let's see HOW**:

Over 60 adaptable lesson scenarios and practical activities for 21st century learners

MASTERING EDUCATION THROUGH AWARENESS

A Teacher's Guide for Cultivating Metacognition, Critical Thinking, and Reflective Learning

Beata Mirecka-Jakubowska

An experienced educator, long-time teacher, and examiner of IB English B. A passionate advocate for continuous skill development. A professional in Understanding by Design (UbD), and a course designer utilizing Blended Learning and Project/Inquiry-based Learning. A promoter of learning through social engagement (Service Learning) and the effective use of new technologies in the classroom. For many years, she has integrated lifelong learning skills training into curricula and practice. In the programs or courses she designs for educators, she promotes a growth mindset for both teachers and students, fostering the acquisition of a wide range of 21st-century skills while learning the language. Winner of the prestigious European Language Label 2024 for her project "Connected Learning - implementing international and intercultural online student collaboration, focused on 21st century skills." More information on Beata's activities on www.iecgroup.education.

Katarzyna Pelc

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