Co-funded by
the European Union

unBLOCKed

Using VR Technology in the Design of Teaching Practices for Students with Disabilities in Special Education

2025-1-ES01-KA220-SCH-000352919

PRACTICAL TEACHERS TRAINING GUIDE

aspaym castilla y león

Brainstorming

MERSİN - BOZYAZI İLÇE MİLLÎ EĞİTİM MÜDÜRLÜĞÜ

MAKER MINDS CONSULTANCY AND TRAINING.

Učenje, … iz šole v življenje
Center Janeza Levca Ljubljana

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1. Purpose of the Training

Generally, teachers working with students with special educational needs face the challenge of responding to highly diverse learner profiles with limited resources, tight schedules and often insufficient specific support to innovate. The fact that their classrooms include different levels of autonomy, learning pace, and cognitive, sensory or behavioural difficulties means that traditional teaching approaches are often not enough to maintain attention, foster active participation and ensure that all students understand the content. At the same time, teachers are expected to integrate digital tools and innovative approaches without always having received the practical training needed to do so in a safe and inclusive way, which can generate resistance to change.

In this context, there is a growing need to integrate Virtual Reality and digital game-based learning into special education settings, as these technologies offer more visual, interactive and adaptive ways of teaching than traditional methods. For many students with special educational needs, abstract concepts, social norms or daily-life routines are easier to understand when they can be experienced in a safe, simulated environment where information is presented step by step and at their own pace. VR and educational games can transform repetitive practice into engaging activities, increase motivation and attention, and provide teachers with flexible tools to adapt tasks, levels of difficulty and feedback to different abilities within the same classroom.

This training is directly aligned with the objectives of the unBLOCKed project, which seeks to promote inclusion, innovation and the development of teachers' digital competences in special education. By focusing on the use of VR and digital game-based learning with students with special educational needs, the training supports more inclusive classroom practices and offers accessible experiences that can be adapted to different abilities and learning profiles. At the same time, it introduces innovative methodologies that move beyond traditional approaches and help schools advance in their own digital transformation. For teachers, this training can be conceived as a concrete opportunity to strengthen their digital competences in a practical way, so that they can confidently integrate VR tools and

educational games into their everyday teaching and become active drivers of change within their schools.

1.1 General Objective

Therefore, this training aims to equip teachers with concrete skills, digital tools and pedagogical strategies to confidently integrate Virtual Reality (VR) and digital game-based learning into their practice, so that teaching for students with special educational needs becomes more inclusive, engaging and effective.

By strengthening teachers' capacity to use VR and digital game-based learning, the training contributes directly to improving both educational quality and inclusion. It supports more personalised, multisensory and engaging learning experiences that can be adapted to different abilities, helping students with special educational needs participate more actively. At the same time, it encourages teachers to move beyond purely traditional methods, fostering classroom practices where diversity is supported and valued as an integral part of high-quality education for all.

Moreover, the training is closely connected to the key learning areas addressed in the project, such as daily life skills, social adaptation and social life. It is designed to help teachers support routines like personal care and household tasks, to rehearse everyday situations in the community and to practise social norms and interaction rules in a safe, controlled environment. The training ensures that teachers can translate technological innovation into progress in students' autonomy, social participation and quality of life.

1.2 Specific Objectives

Integrating VR technology in classroom planning

The training will support teachers in embedding VR activities within their regular teaching sequences rather than using them as isolated sessions. Teachers will learn how to identify where VR can add value to specific learning objectives, choose or adapt appropriate VR scenarios, and plan clear phases before, during and after the VR experience. They will also be

guided to define expected learning outcomes and assessment criteria, and accessibility considerations so that VR becomes a coherent part of everyday lesson design.

Applying learning methods based on digital games

Teachers will learn to select or design digital games that match the skills and content they want to teach and define what students should learn through the game. They will also explore how to use core game elements such as feedback, levels, challenges and collaboration to support motivation and persistence, while keeping a strong pedagogical focus so that play remains inclusive and aligned with the needs of students with special educational needs.

Designing inclusive learning experiences

Finally, teachers will learn to provide multiple ways of engaging with the content (e.g. visual, auditory elements), offer different levels of support and difficulty within the same activity, and create clear, predictable structures so that all students can participate safely and confidently. They will also be encouraged to incorporate opportunities for cooperation, ensuring that VR and digital games not only teach specific skills, but also promote a classroom climate where every learner feels recognised, included and able to contribute.

1.3 Impact on Students

One important impact of the training on students with special educational needs is the improvement of their motivation and participation in the classroom. By learning how to use VR and digital game-based activities, teachers can offer more interactive experiences than traditional lectures, which helps capture and sustain students' attention. When students can explore familiar situations, make choices and receive immediate feedback in a virtual environment, they are more likely to feel engaged, to take an active role in the activity and to persist with tasks that would otherwise seem repetitive. In this way, the competences acquired by teachers translate into day-to-day classroom practices where students with special educational needs are more involved and participate more frequently.

Another key impact of the training is stronger support for the development of daily life and social skills. When teachers know how to use VR and digital games they can create repeatable situations where students practise routines without the pressure or risks of real-life contexts. In parallel, VR scenarios and game-based activities give students opportunities to rehearse appropriate behaviours and receive immediate feedback. In this way, the competences acquired by teachers help turn technology into a concrete tool for building autonomy and social participation, not just for delivering academic content.

A further expected impact on students with special educational needs is the reduction of barriers to learning through the use of visual and interactive resources. When teachers are able to design and implement VR and game-based activities effectively, information is no longer presented only through text or oral explanations, but also through images, movement, sound and simulated action, which can be easier to process for many learners. This way, the training enables teachers to turn VR and digital games into accessible pathways to the curriculum, making it more likely that students who usually struggle with conventional materials can access, engage with and retain what they are expected to learn.

1.4 Contribution to Inclusive Education

This training helps schools move towards a more inclusive and digital culture by showing teachers how VR and digital game-based learning can be used as regular tools to support diverse learners. When teachers are able to execute accessible, interactive activities that respond to different needs, the message for the whole school community is that technology exists to remove barriers and give every student a meaningful way to participate. Over time, this shifts expectations about ¡ good teaching practices and encourages other colleagues to explore similar approaches in their own classrooms.

The use of VR and games also has strong potential to inspire wider changes in teaching practice across the centre. Visible examples of students with special educational needs engaging successfully in VR scenarios or game-based tasks can estimulate professional dialogue and motivate teams to rethink how they plan, differentiate and assess learning. Teachers who complete the training are expected to act as agents of change within their schools: sharing experiences with peers, supporting colleagues in the first steps with VR or

games, and contributing to school-level decisions on how digital tools are integrated into plans, projects and support measures. In this way, the impact of the training goes beyond individual classrooms and contributes to building a more inclusive, innovative and digitally confident school environment.

2. Target Group

The training programme is designed for a diverse group of education professionals who play a key role in integrating Virtual Reality (VR) technologies into everyday teaching and learning. Together, they represent the pedagogical, technical, and strategic capacity of a school to adopt innovative digital tools in an inclusive and sustainable way.

The training is designed for:

- Special education teachers
- Mainstream teachers working with inclusive classrooms
- ICT coordinators
- Teacher trainers
- School administrators interested in digital inclusion

Special Education Teachers

This group includes professionals working with students with Mild Intellectual Disability (MID), Learning Disabilities (LD), ADHD, ASD, and other special educational needs. They are directly involved in designing adapted learning pathways, implementing individualized support strategies, and ensuring accessibility in all learning environments. Through the training, they will acquire practical skills to use VR as a tool for functional learning, social-emotional development, and independent living skills. Their expertise is essential for evaluating how VR scenarios can reduce cognitive load, support visual learning, and create safe spaces for practicing real-life situations.

DigCompEdu Competences They Will Develop

- **Area 2: Digital Resources** – Selecting and adapting VR content to meet SEN learners' cognitive, sensory, and behavioural needs.
- **Area 3: Teaching & Learning** – Designing structured, step-by-step VR learning sequences that reduce cognitive load.
- **Area 5: Empowering Learners** – Using VR to personalise learning pathways and support autonomy, communication, and social skills.
- **Area 6: Facilitating Learners' Digital Competence** – Guiding SEN students in safely navigating immersive environments.

Contribution to the Institution

- Ensuring accessibility and inclusion in all VR scenarios.
- Providing expertise on individualised support and IEP alignment.
- Modelling inclusive digital pedagogy for colleagues.

Mainstream Teachers Working in Inclusive Classrooms

These teachers work with heterogeneous groups of learners and are responsible for creating learning environments where all students can participate meaningfully. They will learn how to integrate VR activities into the curriculum, differentiate instruction using immersive tools, and facilitate collaborative learning experiences. Their participation ensures that VR is not limited to special education settings but becomes a resource for universal design for learning (UDL), benefiting the entire classroom.

DigCompEdu Competences They Will Develop

- **Area 2: Digital Resources** – Integrating VR into curriculum subjects and adapting materials for diverse learners.
- **Area 3: Teaching & Learning** – Facilitating collaborative VR activities and managing classroom workflows.

- **Area 4: Assessment** – Using VR-based observation and performance tasks to assess understanding.
- **Area 5: Empowering Learners** – Applying UDL principles through immersive learning experiences.

Contribution to the Institution

- Demonstrating how VR enhances learning for mixed-ability groups.
- Sharing curriculum-based VR lesson models.
- Supporting the mainstreaming of inclusive digital practices.

ICT Coordinators and Digital Innovation Specialists

ICT coordinators provide the technical backbone for implementing VR in schools. They support teachers in setting up equipment, managing digital platforms, ensuring data security, and troubleshooting technical issues. Through the training, they will deepen their understanding of VR pedagogical applications, enabling them to guide colleagues, maintain the technological infrastructure, and contribute to long-term digital transformation strategies within the school.

DigCompEdu Competences They Will Develop

- **Area 1: Professional Engagement** – Supporting teachers in adopting VR and participating in digital innovation processes.
- **Area 2: Digital Resources** – Managing VR devices, platforms, and digital safety protocols.
- **Area 3: Teaching & Learning** – Understanding pedagogical uses of VR to better support teachers.
- **Area 6: Facilitating Learners' Digital Competence** – Ensuring safe, ethical, and responsible use of immersive technologies.

Contribution to the Institution

- Providing technical infrastructure and troubleshooting.
- Ensuring data protection and safe digital practices.
- Advising on sustainable digital transformation strategies.

Teacher Trainers and Professional Development Facilitators

This group includes educators responsible for mentoring colleagues, organizing workshops, and supporting continuous professional development. They will learn how to design training modules, model effective VR-based teaching practices, and coach teachers in reflective use of immersive technologies. Their involvement ensures that the knowledge gained during the project is multiplied and sustained across the institution.

DigCompEdu Competences They Will Develop

- **Area 1: Professional Engagement** – Leading professional learning communities and mentoring colleagues.
- **Area 3: Teaching & Learning** – Modelling effective VR-enhanced teaching practices.
- **Area 4: Assessment** – Supporting teachers in evaluating VR-based learning outcomes.
- **Area 5: Empowering Learners** – Promoting inclusive, learner-centred digital pedagogy.

Contribution to the Institution

- Multiplying the impact of the training through workshops and coaching.
- Ensuring continuity and long-term professional development.
- Building a reflective, innovation-oriented school culture.

School Administrators and Decision-Makers Interested in Digital Inclusion

School leaders, principals, and administrative staff play a crucial role in creating the conditions for successful VR integration. They will explore how immersive technologies can support inclusive education policies, improve student engagement, and align with

institutional development plans. Their participation ensures strategic alignment, resource allocation, and long-term sustainability of VR-based initiatives.

DigCompEdu Competences They Will Develop

- **Area 1: Professional Engagement** – Understanding the strategic value of VR for school development.
- **Area 2: Digital Resources** – Planning investments and ensuring sustainable access to VR tools.
- **Area 3: Teaching & Learning** – Supporting pedagogical innovation and teacher collaboration.
- **Area 5: Empowering Learners** – Ensuring equity, inclusion, and accessibility in digital initiatives.

Contribution to the Institution

- Providing leadership and strategic direction for VR integration.
- Aligning VR initiatives with school policies and Erasmus+ priorities.
- Ensuring sustainability through resource allocation and long-term planning.

3. Training Structure

The training programme is designed as a **20–25-hours experience**, structured into six progressive modules that guide participants from foundational concepts of inclusive digital pedagogy to the practical design, implementation, and evaluation of VR-based learning activities. The structure ensures a balance between theory, hands-on exploration, collaborative design, and reflective practice, enabling teachers to confidently integrate VR and game-based learning into their classrooms.

Module 1 – Inclusive Education & Digital Pedagogy

Duration: 3 hours

The training begins with a shared understanding of inclusive education principles and the challenges faced by students with disabilities. Through discussions, case studies, and reflective exercises, participants explore how digital tools - particularly VR—can reduce barriers to learning. This module sets the pedagogical foundation for the entire programme, ensuring that all subsequent activities are grounded in accessibility, equity, and student-centred teaching.

Module 1 opens the training with a deep, reflective exploration of what inclusive education truly means in today's digital world. Rather than beginning with technology, the module begins with people - with the lived experiences of teachers and the diverse realities of the students they support. It creates a shared foundation of understanding, empathy, and purpose before moving into the more technical aspects of VR and game-based learning.

The session starts with an open icebreaker conversation, where teachers are invited to speak honestly about the challenges they encounter when working with students with disabilities. This moment is more than a warm-up; it becomes a space where participants recognise common struggles, validate each other's experiences, and begin forming a supportive learning community. As teachers share stories from their classrooms, patterns emerge: difficulties with attention, barriers to participation, struggles with abstract concepts, or the need for alternative ways to experience the world. These insights set the emotional and pedagogical tone for the entire training.

The module then transitions into a set of carefully chosen case studies that bring these challenges to life. Participants examine scenarios such as a student with autism who becomes overwhelmed by abstract explanations, or a student with a mobility impairment who cannot join outdoor activities. Through guided discussion, teachers analyse the barriers these students face and begin imagining how digital environments - especially immersive ones - could offer new pathways to understanding, participation, and engagement. VR becomes not just a tool, but a bridge: a way to make the invisible visible, the inaccessible accessible, and the abstract concrete.

To close the module, teachers engage in a personal reflection exercise. Each participant identifies one specific challenge from their own classroom and considers one way technology might help address it. This final step transforms the module from a theoretical exploration into a practical commitment. Teachers leave with a clearer vision of how digital pedagogy can support their students and with a renewed sense of agency in shaping inclusive learning environments.

Module 1 is not simply an introduction - it is a mindset shift. It invites teachers to see technology not as an add-on, but as a meaningful ally in creating classrooms where every learner can participate, grow, and succeed.

Module 2 – Introduction to VR in Education

Duration: 4 hours

Module 2 invites teachers to step into the world of Virtual Reality and experience firsthand the potential it holds for learners with special educational needs. Participants explore what VR is, how it works, and why immersive learning can be transformative. The session is highly experiential: teachers test VR headsets, navigate 360° environments, and interact with simple simulations. As they explore, they reflect on how VR changes engagement, motivation, and understanding. Discussions focus on which students might benefit most - those who need concrete representations, safe simulations, or alternative ways to access experiences they cannot have in real life. By the end of the module, VR is no longer an abstract concept but a tangible tool that teachers can envision using with purpose and confidence.

Module 3 – Game-Based Learning for Special Education

Duration: 4 hours

Module 3 shifts the focus to the principles of game-based learning and how they can support cognitive and emotional development in students with disabilities. Teachers explore the mechanics that make games powerful learning tools: points, levels, challenges, feedback, and

rewards. They analyse how these elements can strengthen attention, memory, problem solving, and motivation—especially for learners who struggle with traditional instruction. The module encourages teachers to think creatively about how digital games can be adapted to different learning profiles, ensuring that every student can participate meaningfully. Through examples and guided discussions, participants begin to see game-based learning not as entertainment, but as a structured, intentional pedagogical strategy.

Module 4 – Designing VR Learning Activities

Duration: 6 hours

This is the core creative module of the training. Here, teachers move from exploration to design, learning how to create VR enhanced lesson plans that align with curriculum objectives and respond to students' needs. Using a clear framework - learning objective, VR activity, student interaction, assessment - participants design their own immersive learning experiences. They work individually or in teams, test scenarios, and refine their ideas through peer feedback. The module emphasises accessibility: how to adapt VR content for students with sensory sensitivities, cognitive challenges, or mobility limitations. By the end, teachers have developed concrete lesson prototypes and gained the confidence to integrate VR meaningfully into their teaching practice.

Module 5 – Classroom Implementation & Safety

Duration: 4 hours

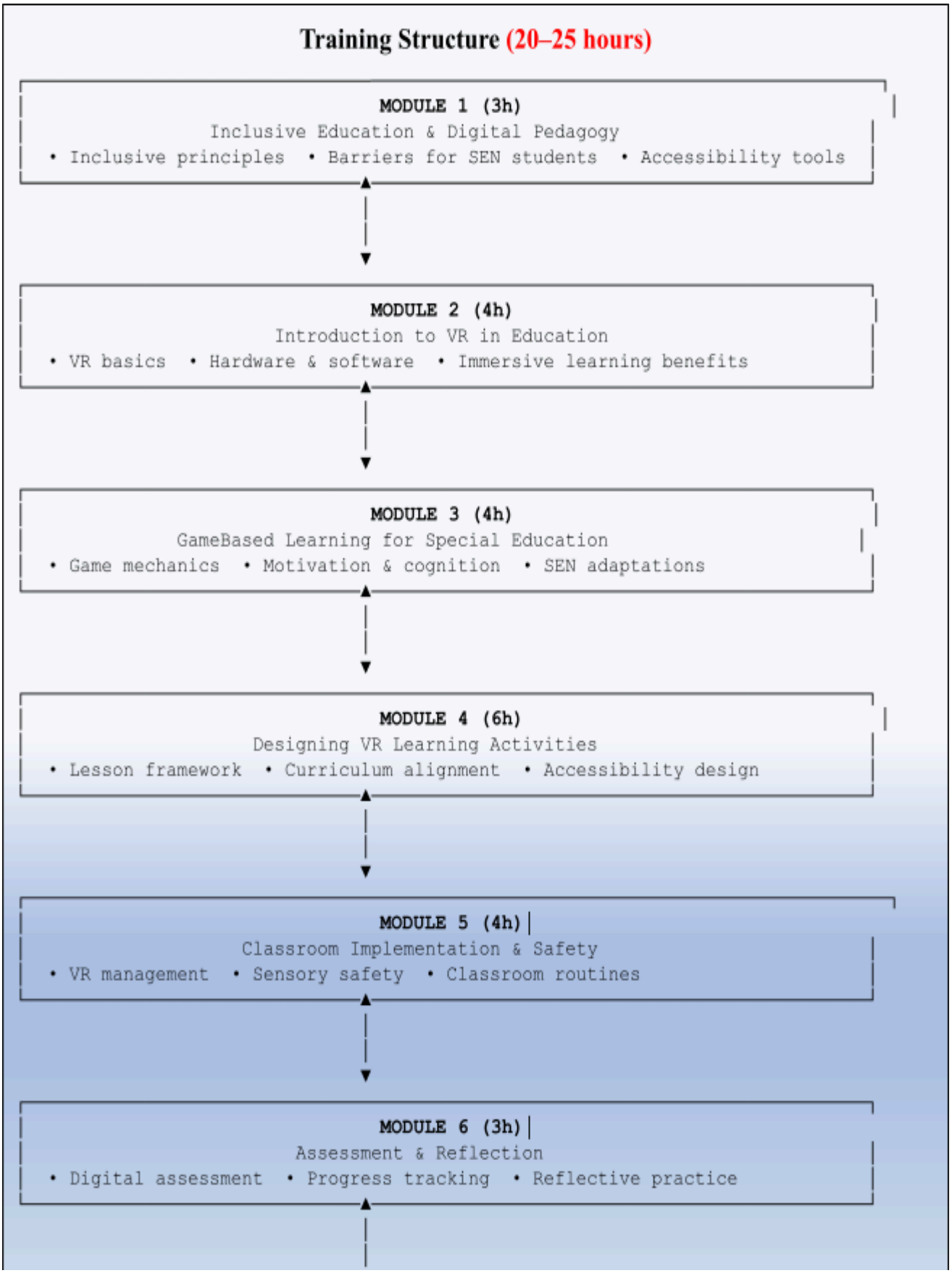
Module 5 focuses on the practical realities of using VR in real classrooms. Teachers learn how to manage VR sessions safely, ensuring that all students - especially those with sensory or physical challenges - can participate comfortably. The module covers essential guidelines: limiting VR sessions to 10–15 minutes, monitoring students closely, offering seated use when needed, and providing breaks for sensory regulation. Participants discuss classroom routines, supervision strategies, and ways to prepare students for immersive experiences. This module

ensures that teachers not only design effective VR lessons but also implement them responsibly and inclusively.

Module 6 – Assessment and Reflection

Duration: 3 hours

The final module brings the training full circle by focusing on assessment and reflective practice. Teachers explore how to evaluate student learning in VR based activities using tools such as observation checklists, student portfolios, digital progress tracking, and reflective journals. They discuss what meaningful assessment looks like in immersive environments and how to document learning beyond traditional tests. The module ends with a collective reflection session, where participants share what worked well, what challenges they encountered, and how they plan to refine their VR activities moving forward. This closing conversation reinforces the idea that digital pedagogy is an ongoing journey of experimentation, adaptation, and growth.


Training Structure (20–25 hours)
MODULE 1 (3h)
Inclusive Education & Digital Pedagogy
• Inclusive principles • Barriers for SEN students • Accessibility tools
MODULE 2 (4h)
Introduction to VR in Education
• VR basics • Hardware & software • Immersive learning benefits
MODULE 3 (4h)
GameBased Learning for Special Education
• Game mechanics • Motivation & cognition • SEN adaptations
MODULE 4 (6h)
Designing VR Learning Activities
• Lesson framework • Curriculum alignment • Accessibility design
MODULE 5 (4h)
Classroom Implementation & Safety
• VR management • Sensory safety • Classroom routines
MODULE 6 (3h)
Assessment & Reflection
• Digital assessment • Progress tracking • Reflective practice

4. Module Descriptions

TEACHER-TRAINING PROGRAMME

Inclusive Education and Digital Pedagogy

Introduction to the Training Programme

"Nothing about us without us."

A programme that begins with a question, not a device

This programme is about digital technology in the education of children and young people with special educational needs – virtual reality, game-based learning, assistive tools, learning analytics. Yet it does not begin with any of them. It begins with a prior question, because everything we later do with technology depends on the answer: *how do we actually understand a child's disability and special needs?* A headset, a game or a dashboard is never neutral. It arrives already shaped by an assumption about where the problem lies – in the child, or in the world built around the child – and it will quietly reproduce that assumption in every lesson unless we make it explicit and choose otherwise. The order of this programme reflects that conviction: we settle the stance first, and only then pick up the tools.

The stance: from deficit to participation

The stance we adopt is emancipatory rather than adaptive. The **medical model** locates disability inside the person: the child cannot do something, so we treat, correct or "fix" them. The **social model** shows that the barrier usually lies not in the person but in an environment that was never designed for them. The **rights-based model**, grounded in the Convention on the Rights of Persons with Disabilities, goes further still: participation is not a favour granted to the child but a right that belongs to them, and no decision about a child may be taken without them.

Take the learner who does not speak. In medical language we say they "cannot communicate"; give them augmentative and alternative communication and it turns out they can. What was missing was the means, not the ability; the barrier was in the environment,

not in the child. That reversal – from deficit in the person to barrier in the world – is the single move the whole programme is built to protect, through every technology it introduces.

The question every module carries

Because a technology can lower a barrier or raise a new one with equal ease, each module returns to the same test, phrased in its own terms. In virtual reality it becomes: does this create genuine *presence*, or merely *novelty*? In game-based learning: does the design nourish the learner's own motivation, or bribe it away? In implementation: is this fidelity or thoughtful adaptation, and have we secured consent – or at least assent – and the right to withdraw? In assessment: are we measuring what matters, holding to the principle that the measurable is not the meaningful? Beneath all of these lies one question, and it is the thread to follow from the first page to the last: **does what we do serve the learner's participation and dignity, or only their attention?**

The arc of the six modules

The six modules are not six topics side by side; they are one argument that builds. **Module 1, Inclusive Education and Digital Pedagogy,** sets the stance – the models of disability, the neurodiversity paradigm(Walker (2021), the difference between inclusion and integration, and the three principles of Universal Design for Learning as the design grammar we carry throughout. **Module 2** introduces the medium: virtual and immersive reality, and the crucial distinction between immersion and presence – between what surrounds the senses and what a learner actually inhabits. **Module 3** supplies the motivational structure – game-based learning read through self-determination theory and flow, and read critically against the reduction of learning to points and rewards.

Module 4 turns stance, medium and motivation into a method: designing backwards from the outcomes that matter, through the affordances a technology genuinely offers, to activities that are accessible by design rather than adapted after the fact. **Module 5** asks how to carry all of this into a real classroom safely – fidelity and adaptation, safeguarding and duty of care, health and data protection, and the psychological safety without which none of it is ethical. **Module 6** closes the circle with the hardest question: did it help, and how would

we know in a way that respects the learner rather than reducing them – assessment *for* learning rather than *of* it, the growth of the child measured against themselves rather than against a norm, and reflective practice that keeps the teacher learning too.

How each module is structured

Every module spans three school lessons. The first is an introductory **lecture** that develops the module's ideas in continuous prose, organised into short thematic sections and punctuated by four kinds of callout – a key concept, a caution, a practical checklist, and a note tying the theme back to inclusive practice. The second and third lessons are two hands-on **workshops** followed by a structured **reflection**. The workshops are deliberately practical: participants sort real examples, redesign a flawed activity, or audit a draft lesson against the frameworks just introduced. The reflection closes each module in the same form – a short "My stance" statement and a recurring question about the critical use of digital pedagogy – so that across the programme you build not a checklist of techniques but a considered position of your own.

How to read this handbook

The modules are written to be read in order, because each leans on the vocabulary and the test established by those before it. Terms are used precisely and consistently, and a bilingual glossary accompanies the handbook for reference. The evidence is treated honestly: where research supports a practice we say so, and where the evidence is thin, heterogeneous or inflated by novelty we say that too – because *techno-solutionism*, the belief that a device will resolve a difficulty that is really pedagogical, relational or structural, is itself one of the barriers this programme exists to remove. Language throughout respects the person before the diagnosis, and the learner's own voice is treated as a source of evidence, not merely an object of it.

A closing note

The tools in this programme are powerful and worth learning well. But they are means, and the end is not the technology. The end is a child who is able to take part – to be present, to

be understood, to be counted among the others – and who is met, throughout, with **dignity before quantification**. If a device serves that, use it. If it does not, the most inclusive decision may be to set it aside. That judgement, exercised again and again in the ordinary situations of teaching, is what this programme is finally trying to cultivate.

Introductory Lectures and Workshops for the Modules

Each module is designed to last three lessons: the first lesson is an introductory lecture, the other two are workshops and reflection. For each module there is a written lecture text with notes and an example, together with workshops and reflection that meaningfully complement the lecture (approximately two lessons in total). Where the guide envisages more hours for an individual module (four or more), the set of workshops is expanded accordingly (additional exercises, longer design work, more time for reflection).

Overview of Modules

Module	Structure	Key contemporary theoretical content
1 – Inclusive Education and Digital Pedagogy	3 lessons (1 + 2)	Social and rights-based model of disability (CRPD); neurodiversity; inclusion vs. integration; UDL 3.0; critical digital pedagogy; epistemic justice
2 – Introduction to Virtual Reality (VR)	4 lessons (1 + 3)	Immersion vs. presence (Slater); reality–virtuality continuum; embodied cognition and the Proteus effect; experiential and situated learning; cognitive load; cybersickness
3 – Game-Based Learning	4 lessons (1 + 3)	Gamification vs. serious games; self-determination theory; flow; productive failure; the MDA framework; game

Module	Structure	Key contemporary theoretical content
		accessibility; critique of "pointsification" (**Margaret Robertson (2010)**
4 – Designing Learning Activities with VR	6 lessons (2 + 4)	Backward design and constructive alignment; the CAMIL model (2021); UDL in design; embodied design; task analysis and transfer; co-design; ethics in design
5 – Classroom Implementation and Safety	4 lessons (1 + 3)	Implementation science; TPACK and SAMR; children's rights in the digital environment (General Comment No. 25); health and safety; GDPR and biometric data; psychological safety
6 – Assessment/Monitoring and Reflection	3 lessons (1 + 2)	Assessment for learning; ipsative assessment; goal attainment scaling; learning analytics and its ethics; reflective practice (Schön, Gibbs); communities of practice; learner's voice

Structure of each module (3 lessons): Lesson 1 – introductory lecture; Lessons 2–3 – workshops and reflection.

Module 1: Inclusive Education and Digital Pedagogy

Structure (3 lessons): Lesson 1 – introductory lecture; Lessons 2–3 – workshops and reflection.

Module Objectives

By the end of the module, participants:

- understand the medical, social, rights-based and biopsychosocial views of disability, as well as the neurodiversity paradigm;

- distinguish inclusion from integration and know the three principles of Universal Design for Learning (UDL 3.0);
- understand the core principles, possibilities and limits of digital pedagogy;
- know the main categories of assistive digital tools;
- can prepare an adapted learning activity and assess its risks;
- evaluate their own stance along the continuum from the medical to the emancipatory approach.

Introductory Lecture (Lesson 1)

Inclusive education

Before we touch any modern digital device, we must ask a fundamental question: how do we actually understand children's disability and special needs? Everything we then do with technology depends on it.

The medical model locates the problem or disability within the person – the child cannot do something, so we "treat or even fix" them. The social model shows that barriers usually lie not in the person but in an environment that was not designed for them.

The rights-based model, as grounded in the Convention on the Rights of Persons with Disabilities, goes a step further: *participation is not a favour but a right, and no decision about a child may be made without them – "nothing about us without us."*

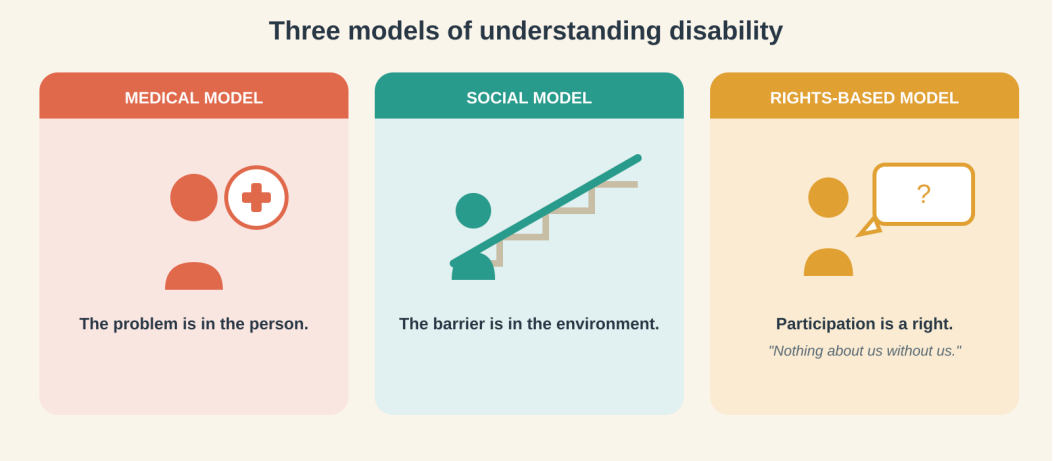


Figure 1: Three models of understanding disability: from "the problem is in the person" to "the barrier is in the environment" and "participation as a right"

Take the example of a learner who does not speak. In medical language we would say they "cannot communicate." Yet if augmentative and alternative communication is available, it turns out they can – what was missing was the means, not the ability. The barrier was in the environment, not in the child. This is a reversal we must hold onto throughout all the modules.

Important addition: the body that also hurts

The social model is a necessary correction to the medical one, but we do not read it absolutely. Some disabilities – especially progressive and chronic illnesses – bring pain, fatigue and loss that no change in the environment can remove. The contemporary biopsychosocial approach (embodied in the World Health Organization's ICF classification) therefore combines both: we remove environmental barriers without reservation, while also acknowledging the bodily reality of impairment, without aestheticizing or denying it.

For learners with progressive illnesses this means that the principle "the barrier must be removed from the environment" is complemented by "and where something cannot be removed, we remain present." Inclusion is not a denial of the body; it is respect for the child as a whole - for their abilities and their vulnerability at once.

This is closely connected with the contemporary paradigm of neurodiversity: *we understand the diversity of human minds as variation, not as a deviation to be straightened out.* Our aim is not to make a child "typical," but to remove barriers to their participation.

Inclusion is therefore not integration. The latter places the child into an unchanged system or framework and expects them to adapt to it. Inclusion, by contrast, reshapes the system itself.

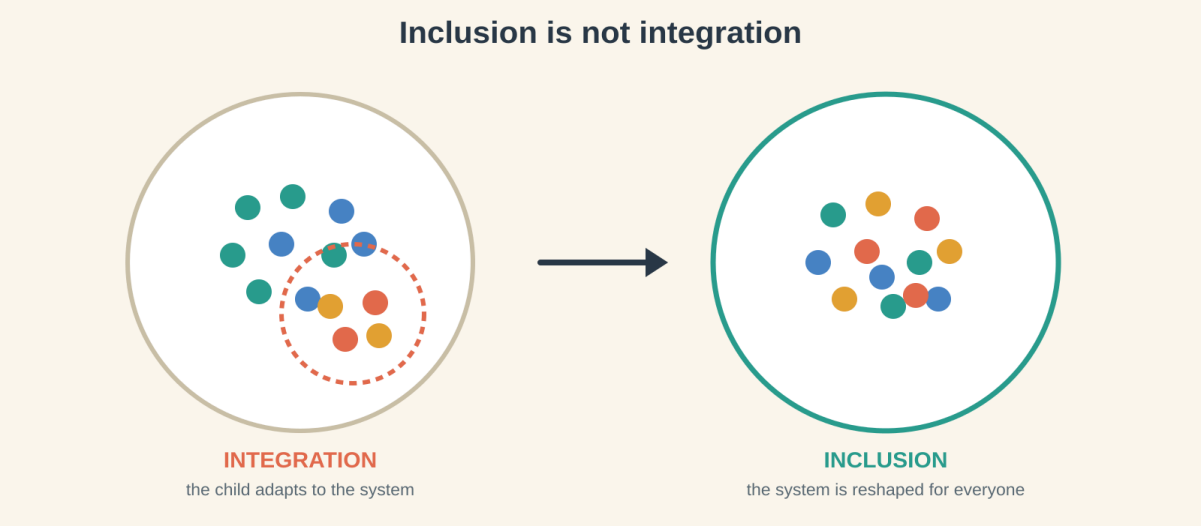


Figure 2: Integration inserts the child into an unchanged system (and often gathers them into a separate group); inclusion reshapes the system so that there is room for everyone

The design grammar of this transformation is Universal Design for Learning (UDL). Its core principles state that we should offer multiple means of engagement, of representation, and of action and expression. The contemporary 2024 version (UDL 3.0) adds something important: *identity as part of learner variability, the explicit addressing of bias and exclusionary systems, and the role of play, joy and interdependence in learning, which contribute to learner wellbeing.*

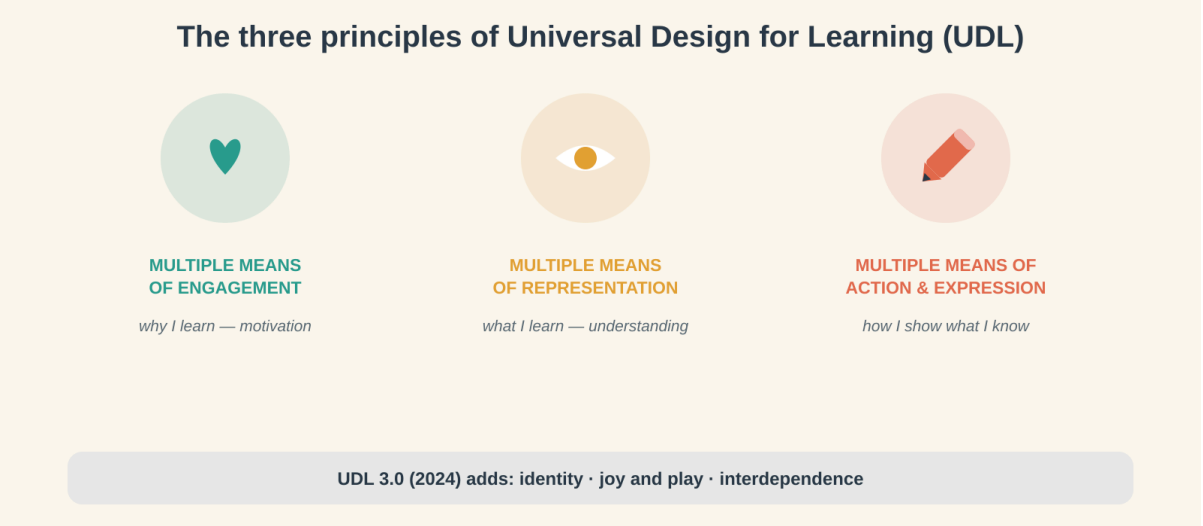


Figure 3: The three principles of UDL and the additions of the UDL 3.0 version (2024)

Digital pedagogy

Digital pedagogy transforms education by focusing on the meaningful integration of technology into teaching. Its core features include:

- **adapting to the needs of contemporary generations;**
- **individualizing learning**; and
- **a shift to interactive, virtual or hybrid learning environments.**

At present we recognize three models of hybrid learning:

- **Flipped Classroom:** at home, via video, learners work through the theory. In class they then solve tasks and discuss.
- **Station Rotation:** learners move between stations in the classroom. One station is for computer work, another for group work, and a third for the teacher's explanation.
- **Day-based hybrid model:** certain days of the week are devoted to remote lectures, the rest to practical work at school.

Categories of assistive digital tools (vendor-neutral)

Because specific products change quickly, it is worth remembering the categories, not the names:

- augmentative and alternative communication (AAC) – symbol and picture boards, speech-generating apps;
- text-to-speech (TTS) and speech-to-text (STT);
- screen readers and magnifiers for low vision;
- alternative input – switches, eye-tracking, adapted keyboards;
- tools for structure and attention – reading overlays, timers, organizers;
- artificial-intelligence tools – text simplification, real-time translation, image descriptions.

For every tool, consider three things in advance: accessibility, cost and data protection.

When technology enters, the caution of critical digital pedagogy is essential: *technology is not neutral*. The same application can include or exclude – depending on accessibility, cost, data risks. This means we must attend to so-called techno-solutionism, the belief that a tool will by itself solve a pedagogical problem, and to the datafication logic that turns children into a collection of measurements.

Digital pedagogy for learners with special cognitive needs is not primarily about learning technology, but about learning how to use technology to create conditions for better learning, greater independence and greater inclusion. Artificial intelligence is not an end in itself, but a tool for removing barriers to learning.

Finally, epistemic justice *(a concept developed by the philosopher Miranda Fricker as testimonial and hermeneutical injustice)* reminds us that learners with special needs are subjects who know a great deal, persons whose perspective counts – too often they are overlooked as sources of knowledge about their own lives. Everything we do with technology should therefore be in the service of participation and dignity. This is the emancipatory paradigm from which the guide proceeds, and the foundation of everything that follows.

And one small matter of consistency: training about inclusion should itself model UDL – we offer materials in multiple forms (text, image, recording), and participants multiple ways to engage and express. Whoever teaches inclusion in an exclusionary way contradicts themselves.

Important note (for the facilitator)

Lecture duration: 20–25 minutes; devote the remainder of the first lesson to questions and discussion. Begin with a question to the group: when you describe a learner, do you describe them by deficit or by what creates barriers for them? Emphasize that UDL 3.0 is the latest version (2024). The AAC example may be replaced with one from your own practice. Conclude: technology is a tool of this stance, not its replacement.

Workshops and Reflection (Lessons 2 and 3)

Workshop 1: Barrier or deficit? (30 min)

Aim: to move from describing a child in the language of deficit to the language of environmental barriers, and to link this with a technological response.

Procedure:

- In pairs, participants receive three short descriptions of learners, written in the language of deficit (e.g. "cannot …", "is not equipped …").
- They reframe each description in the language of the social model: which environmental barrier is actually at work?
- For each case they add one way technology could lower or remove the barrier – and one risk it could introduce or increase.
- In the plenary, pairs share one example; the facilitator notes patterns on the board as they go.

Format: pair work, then plenary exchange.

Output: a table "deficit → barrier → technological response (and risk)."

Workshop 2: UDL review of an activity (35 min)

Aim: to assess an existing (digital) activity against the three principles of UDL and to improve it concretely.

Procedure:

- Groups choose a familiar learning or digital activity from their own practice.
- They assess it against the three UDL principles: engagement, representation, action and expression.
- They add one lens from UDL 3.0 (identity, joy and play, or interdependence).
- They propose two concrete adaptations and sketch a redesigned version of the activity.

Format: work in groups of 3–4.

Output: a redesigned mini-activity with two concrete adaptations.

Reflection: My stance (25 min)

Each participant writes an answer to:

- Where on the continuum between the medical and the emancipatory approach does my practice currently stand?
- What concrete shift will I make?

Additional question (critical digital pedagogy): in what way might a particular digital tool exclude one of my learners? Optional exchange in pairs.

Special emphasis: from compensation to empowerment

Considering contemporary approaches to inclusive pedagogy, the workshop should not present digital technology or AI as a mere compensatory technology (that compensates for deficits), but as a tool to enhance student autonomy, creativity and collaboration.This means using both to reduce unnecessary cognitive barriers, while enabling students to develop their own learning strategies, critical thinking and a sense of competence. Such a design is consistent with the principles of Universal Design for Learning (UDL), contemporary inclusive pedagogy and the ethical use of technology and AI in education.The result is not only greater digital literacy among teachers, but also a change in their view of technology – from a “tool to make work faster” to a pedagogical partner in creating a more accessible, inclusive and personalized learning environment.

Bridge to Module 2

Once the stance is set – technology in the service of participation and dignity – we can turn to the first concrete technology. Module 2 introduces virtual reality, but with the same question we carry through all the modules: does the tool lower barriers and strengthen presence, or does it add new ones?

Module 2: Introduction to Virtual Reality in Education

Structure (3 lessons): Lesson 1 – introductory lecture; Lessons 2–3 – workshops and reflection.

Module Objectives

By the end of the module, participants:

- distinguish immersion (a technical property of the system) from presence, and name its two components – the place illusion and the plausibility illusion;
- locate VR, augmented reality (AR) and mixed/extended reality (MR/XR) on the reality–virtuality continuum, and choose the right point for a given goal;
- explain embodied cognition and the Proteus effect, and their implications for learning, behavior and identity;
- ground immersive learning in experiential and situated learning, with attention to ecological validity and transfer;
- apply cognitive-load and multimedia-learning principles to design immersive activities that do not overload;
- appraise the evidence base for VR with learners with special needs critically, including the novelty effect;
- address cybersickness and follow XR accessibility guidance (W3C XAUR).

Introductory Lecture (Lesson 1)

Module 1 set the stance: technology in the service of participation and dignity. Module 2 takes up the first concrete technology – virtual reality – and holds it to exactly that test. Throughout, we carry one question: *does this tool lower barriers and strengthen presence, or does it add new ones?*

Immersion vs. presence

When we put on a headset, it is tempting to think the technology alone does the work. It does not. Following Slater, we distinguish immersion – an objective property of the system (how wide the field of view, how accurate the tracking, how low the latency) – from presence, the learner's subjective sense of being there. A powerful headset delivers

immersion; it does not guarantee presence. Slater analyses presence into two illusions: the place illusion (the sense of being in the virtual place) and the plausibility illusion (the sense that what is happening is really happening). Both can break in an instant – a lag, a glitch, an event the world should respond to but does not. The lesson is simple and important: *we do not design immersion, we design for presence, andpresence is fragile.* The most expensive headset can leave a learner cold; a modest set-up, well designed, can make them forget the room.

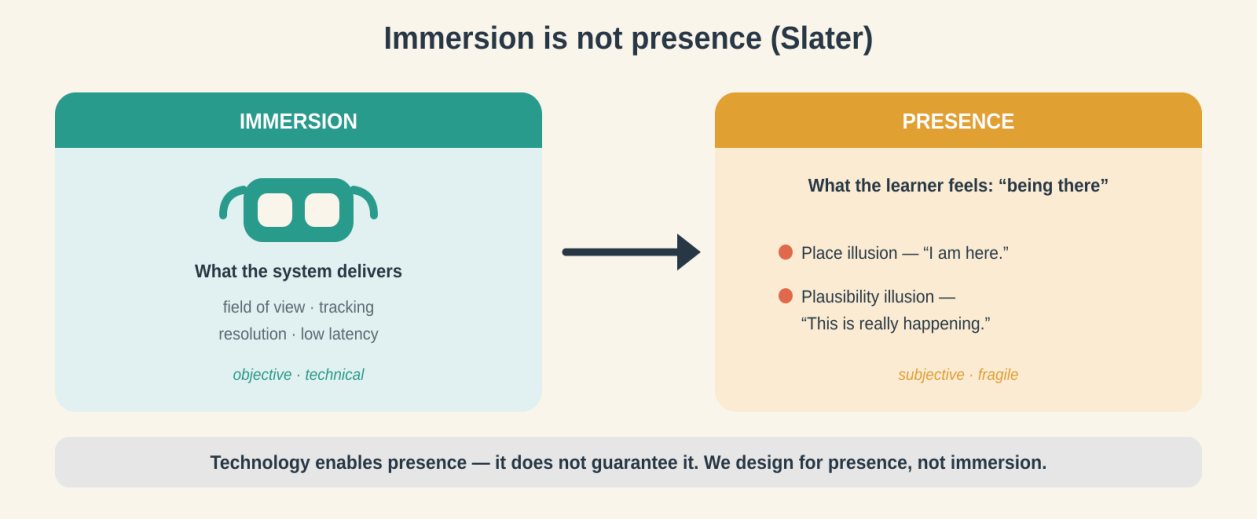


Figure 4: Immersion is what the system delivers; presence is what the learner feels. Technology enables presence but does not guarantee it

The reality–virtuality continuum

Virtual reality is not one thing, and it is rarely the only option. Milgram and Kishino place technologies on a single reality–virtuality continuum: at one end the wholly real environment, at the other the wholly virtual, and between them the broad territory of mixed reality – augmented reality (AR), which adds virtual elements to the real world, and augmented virtuality, which brings real elements into the virtual. Extended reality (XR) is the umbrella term for all of it. Why does this matter pedagogically?

Because it turns "should we use VR?" into a better question: "where on the continuum does this learning goal actually sit?" Sometimes full immersion is exactly right; often a lighter point – AR overlaid on a real task, or a simple two-dimensional simulation – lowers the

barrier just as well, at a fraction of the cost, discomfort and risk. Choosing the right point on the continuum is itself an act of inclusive design.

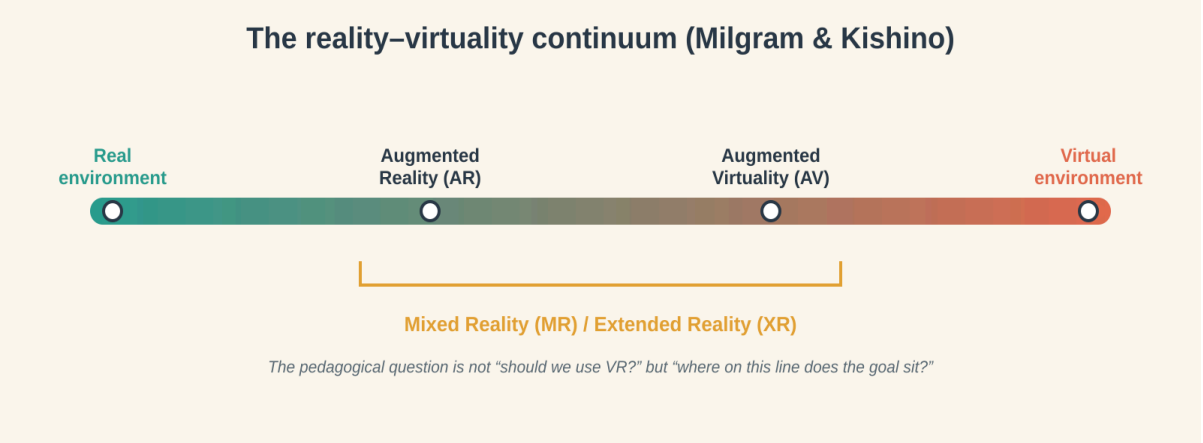


Figure 5: The reality–virtuality continuum. "VR" is one region on a line, not the only option

Embodied cognition and the proteus effect

Immersive learning is bodily, not merely mental. The theory of embodied cognition holds that thinking is shaped by the body and its action in the world – and VR is, above all, a medium of the body: *we turn our head, reach, step back, flinch*. Yee and Bailenson's Proteus effect adds a striking finding: *the avatar we inhabit changes how we behave – a taller avatar can make a person negotiate more assertively, and the change can persist after the headset comes off*. For inclusive education this cuts two ways. It is an opportunity: an avatar can let a learner rehearse a stance, a role or a confidence that is hard to reach in the ordinary classroom. And it is a responsibility: *if body and avatar shape behavior, then who the learner gets to be is a pedagogical and ethical choice, not a cosmetic one*. This is UDL's lens of identity (UDL 3.0), arriving in three dimensions.

Experiential and situated learning

Why might VR teach well? Two older theories explain its promise. Kolb's experiential learning describes a cycle – concrete experience, reflective observation, abstract conceptualization, active experimentation – and VR is a machine for generating concrete experience that would otherwise be impossible, dangerous or inaccessible. Lave and Wenger's situated learning adds that knowledge is bound to the context in which it is used; we learn a practice by taking

part in it, not by hearing about it. VR can situate a learner inside a shop, a street, a job interview, a social encounter. But both theories also name the catch: *ecological validity and transfer*. An experience that feels real is not automatically one that transfers to real life. The design question is therefore not "is it immersive?" but "does what is learned here travel back to the life it is meant to serve?" Without deliberate bridging – reflection, then practice in the real setting – an immersive experience can remain sealed inside the headset.

Cognitive load and multimedia learning

Immersion has a cost, and it is paid in attention. Sweller's cognitive load theory distinguishes the load intrinsic to the material from the extraneous load added by how it is presented, and warns that working memory is easily overwhelmed. A rich, moving, three-dimensional world is a generous source of extraneous load: *everything glitters, everything moves, and the learner must spend attention simply managing the environment before any learning begins*. Mayer's principles of multimedia learning give practical correctives – reduce the irrelevant (coherence), guide attention to what matters (signaling), avoid narrating and captioning identically (redundancy), balance the channels (modality). For learners with special cognitive needs this is not a fine detail but the whole game: *the very immersion that can motivate can also overload, and the same feature is a bridge for one learner and a barrier for another*. We design, therefore, for the minimum immersion that achieves the goal – not the maximum the hardware allows.

The evidence base for VR with special needs

What does the research actually show? The honest answer is: *promise, unevenly*. There are encouraging findings – for practicing social skills with autistic learners, for graded exposure in anxiety, for rehearsing everyday life skills in a safe, repeatable setting. But the evidence is heterogeneous: *studies are often small, short and varied in quality, and effects do not always transfer or last*. Two cautions matter especially. The first is the novelty effect: a new, exciting medium can lift engagement and scores simply because it is new – an advantage that fades. The second is our old acquaintance techno-solutionism: *the belief that the technology itself will do the pedagogical work*. VR is a tool of a stance, not a substitute for one.

Important caution: promise, heterogeneity and the novelty effect

For the learners at the center of this training, the appeal of VR is real: *a safe, repeatable, controllable setting in which to practice a social encounter, face a feared situation in graded steps, or rehearse an everyday life skill*. Early findings in these areas are encouraging.

But we hold the promise lightly. The evidence is heterogeneous and often preliminary; gains do not always transfer to real life or outlast the study, and the novelty effect can flatter early results. Adopt VR where there is a reason specific to this learner and this goal, build in transfer to the real setting, and check whether it actually helps. The question is never "is it immersive?" but "does it lower a barrier that a simpler means would not?"

Cybersickness and XR accessibility

Finally, the body can refuse. Cybersickness – nausea, disorientation, eye strain – is best explained by sensory-conflict (sensory-mismatch) theory: *the eyes report motion that the inner ear does not feel, and the mismatch makes some people unwell*. It is not rare, it is not the learner's fault, and it affects some individuals far more than others. Alongside it sit the wider requirements of accessibility: *immersive environments can exclude by design – through motion, small text, required gestures, sound-only cues, or the simple assumption of two hands, two eyes, two ears and a steady stomach.* The W3C's XR Accessibility User Requirements (XAUR) set out what an inclusive immersive experience must offer: *alternatives to motion, adjustable comfort settings, multiple input and output modalities, captions and descriptions, and control over one's own experience*. Designing for the body that might refuse is not an add-on to immersive learning; in inclusive education it is where the design begins.

Safety and accessibility essentials (plan before use)

- Cybersickness: keep sessions short; prefer seated use and teleport (non-continuous) movement; provide an immediate exit; watch for discomfort and stop early.
- Comfort and control: *adjustable movement, sound and brightness*; the learner controls their own experience and can pause or leave at any time.
- Multiple modalities (W3C XAUR): *alternatives to motion and gesture*; captions and audio descriptions; never rely on a single sense; assume varied bodies and inputs.
- Age, time and hygiene: *follow device age guidance, limit duration, and clean shared headsets*.
- Data protection: headsets can capture biometric data (gaze, movement); treat it as a special category, minimize collection, and confirm GDPR compliance before use.

Important note (for the facilitator)

Lecture duration: 20–25 minutes; devote the remainder of the first lesson to questions and discussion. Open with a question or a short demonstration: has anyone ever felt "really there" in a virtual place – and did the most powerful hardware cause it? Emphasize the single most useful distinction of the module: immersion is not presence. Replace the example scenarios with cases from your own setting. Close by returning to the Module 1 test: *does the tool lower barriers and strengthen presence, or add new ones?* A short, well-supervised headset try-out (with the safety essentials above) is valuable but not required.

Workshops and Reflection (Lessons 2 and 3)

Workshop 1: Does VR earn its place? (45 min)

Aim: to decide, for a given learning goal and learner, whether immersive VR lowers barriers and strengthens presence or merely adds novelty – and, if warranted, to choose the right point on the reality–virtuality continuum.

Procedure:

- In pairs, participants receive three short scenarios (a learning goal plus a learner profile).

- For each, they ask: what barrier would VR remove that a simpler means would not? Is the value presence, or only novelty?
- They place the proposed activity on the reality–virtuality continuum and justify the point chosen (full VR, AR, or a two-dimensional simulation).
- They name one transfer strategy – how the learning will be bridged back to the real setting.
- In the plenary, pairs share one scenario in which they decided against VR, and why.

Format: pair work, then plenary exchange.

Output: for each scenario, a reasoned decision – "VR / lighter option / no" – with a transfer strategy.

Workshop 2: Accessibility and cognitive-load review (45 min)

Aim: to audit an immersive activity against cognitive-load and multimedia-learning principles and against XR accessibility, and to improve it concretely.

Procedure:

- Groups choose (or are given) a short immersive or VR activity.
- They audit it for extraneous load using Mayer's principles (coherence, signalling, redundancy, modality): where does the environment overload rather than teach?
- They review it against XR accessibility (W3C XAUR) – motion alternatives, comfort settings, multiple input and output, captions and descriptions, learner control – and against cybersickness mitigations.
- They propose two concrete adaptations and note who each adaptation includes.

Format: work in groups of 3–4.

Output: a redesigned activity with two adaptations and a short accessibility and comfort checklist.

Reflection: My stance (45 min)

Each participant writes an answer to:

- Where in my practice do I confuse immersion with presence – reaching for the most powerful tool rather than the one that helps the learner be there?
- For one learner I know, would VR lower a barrier or add one (cost, cybersickness, sensory sensitivity, data)? What is my honest answer?

Additional question (critical digital pedagogy): which learner might a given immersive tool exclude by design, and what would I need to change before using it?

Bridge to Module 3

Once we can make an immersive experience meaningful, safe and accessible, the next question is what keeps a learner engaged in it – and how challenge, structure and reward shape learning without collapsing into empty points. Module 3 takes up game-based learning, with the same test we carry throughout: does the design serve the learner's participation and dignity, or only their attention?

Module 3: Game-Based Learning in Special Education

Structure (3 lessons): Lesson 1 – introductory lecture; Lessons 2–3 – workshops and reflection.

Module Objectives

By the end of the module, participants:

- distinguish gamification, game-based learning and serious games, and recognize playful learning;
- use self-determination theory (autonomy, competence, relatedness) as design goals, and recognize the overjustification effect of extrinsic rewards;
- apply flow theory (the challenge–skill balance) and the idea of dynamic difficulty;
- use game-design frameworks (MDA, feedback loops, the magic circle) and design for productive failure;
- apply learning-science principles – immediate feedback, spaced repetition, scaffolding within the zone of proximal development, and mastery learning;
- appraise serious games for executive functions, social-emotional learning and gamified AAC critically, and apply the Game Accessibility Guidelines;

- recognize and avoid pointsification, exploitative design and commercial dark patterns.

Introductory Lecture (Lesson 1)

Modules 1 and 2 set the stance and the first technology. Module 3 turns to a different kind of power – motivation and structure – and asks how games teach, and where the line runs between engaging a learner and merely capturing their attention. Throughout, we keep the question we have carried from the start: *does the design serve the learner's participation and dignity, or only their engagement?*

Distinguishing the concepts

Three terms are constantly confused, and the confusion matters. Gamification adds game elements – points, badges, levels, leaderboards – to an activity that is not itself a game (a spelling worksheet with stars). Game-based learning teaches through playing an actual game, where the learning is woven into the play. Serious games are games designed from the start for a purpose beyond entertainment – to teach, train or rehabilitate. Around all three sits the broader spirit of playful learning: *the disposition of exploration, safe risk and delight, which can live in a lesson with no "game" at all.* Why insist on the distinction? Because they fail differently. Weak gamification bolts rewards onto dull work and calls it fun; a well-made game-based activity or serious game builds the learning into mechanics the learner actually wants to do. For our learners the question is never "is it gamified?" but "is the thing worth doing built into the play, or merely decorated by it?"

Figure 6: Gamification, game-based learning and serious games are not the same thing – and they fail in different ways

Self-determination theory

Why do games motivate? Deci and Ryan's self-determination theory gives the clearest answer: people are drawn to activities that satisfy three basic psychological needs – autonomy (I have meaningful choices), competence (I can grow, and see that I am growing) and relatedness (I am connected to others). Good games are, in effect, machines for meeting these three needs – and these three, not the points, are our design goals. But the theory also carries a warning that runs through the whole module: *the overjustification effect*. When we pay a learner – with stars, tokens, prizes – for something they already found interesting, the external reward can crowd out the internal one, and interest falls when the reward stops. Extrinsic rewards are not forbidden, but they are a strong medicine with side effects. We reach first for autonomy, competence and relatedness – for making the activity itself worth doing – and only cautiously, and temporarily, for rewards on top.

Flow

Flow (Mihaly Csikszentmihalyi) describes the state of absorbed engagement in which we lose track of time – and it has a precise condition: *the balance of challenge and skill*. Too much challenge for the learner's skill breeds anxiety; too little breeds boredom; in the narrow channel between them lies flow. This is perhaps the single most useful design idea in the module, because it explains both disengagement and distress in one picture, and points to the remedy: *dynamic difficulty – a task that adjusts as the learner grows, staying just ahead of their skill without outrunning it*. For learners with special needs, whose skills and states can vary widely from day to day and even hour to hour, the flow channel is not a fixed setting but a moving target: the art is to keep the challenge riding alongside the learner, not to fix it once.

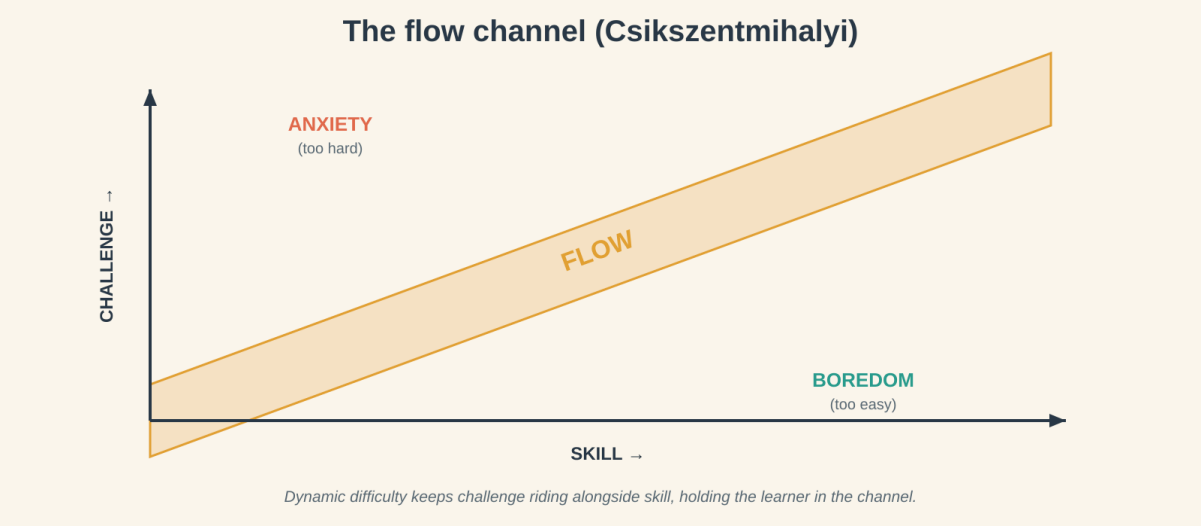


Figure 7: The flow channel: between anxiety (too hard) and boredom (too easy). Dynamic difficulty keeps the learner inside it

Game-design frameworks and productive failure

How is a game actually built to do this? The MDA framework names three layers: *mechanics (the rules and actions), dynamics (the behavior that emerges when players use the mechanics) and aesthetics (the feelings that result)*. Designers set mechanics; players live aesthetics; and the two are joined by dynamics, often through feedback loops that reward and correct in real time. Games also draw a magic circle – a bounded space where ordinary stakes are suspended and it is safe to try, fail and try again. That safety enables one of the most powerful ideas in learning science: the concept of productive failure (Manu Kapur) – the finding that struggling with a problem, and failing in a supported way, before being taught can lead to deeper learning than being shown the answer first. A well-designed game is a place to fail productively: *cheap to fail, easy to retry, honest in its feedback*. For learners who meet failure as threat in the ordinary classroom, a game's magic circle can turn failure from a verdict into a move.

Learning science

Beneath the play, good educational games quietly apply the best of learning science. They give immediate feedback, so error is corrected while it still means something. They can build in spaced repetition, returning to a skill at widening intervals so that it lasts. They scaffold within the learner's zone of proximal development (Vygotsky) – offering just enough support

to do now, with help, what will soon be possible alone, and removing it as the learner grows. And they can pursue mastery learning: *the learner moves on when they have genuinely mastered a step, not when the clock says so*. None of this requires a screen; but games are unusually good at delivering all four at once, for each learner, at their own pace – which is exactly what a class of very different learners needs and a single teacher cannot provide alone.

Contemporary evidence for special needs

What does this look like in special education today? Serious games are used to practice executive functions – planning, inhibition, working memory – and for social-emotional learning, rehearsing the recognition and regulation of emotion in a safe setting. Gamified augmentative and alternative communication (AAC) can make communication practice motivating rather than a chore. As with VR in Module 2, the findings are promising but uneven, and the same cautions apply – the novelty effect and techno-solutionism. And there is a specific, non-negotiable design duty: *the accessibility of the mechanics themselves*. A game can exclude through the very things that make it a game – reaction speed, fine motor precision, color-only cues, complex controls, time pressure. The Game Accessibility Guidelines set out how to widen access: remappable controls, adjustable speed and difficulty, no reliance on a single sense, clear language. A game a learner cannot physically or cognitively play is not motivating; it is one more locked door.

Important caution: rewards, and the point of points

Points, badges and leaderboards are the easiest part of a game to add and the least important. Used carelessly they trigger the overjustification effect – paying a learner for what they already enjoyed, so that interest collapses when the reward stops – and they slide into what Ian Bogost calls pointsification: *compliance dressed up as play*.

Use extrinsic rewards sparingly and temporarily, in the service of the three needs – to help a learner get started or over a hump – and then fade them. Design first for autonomy, competence and relatedness, and for an activity worth doing without the points. If the activity collapses when you remove the rewards, it was decoration, not design.

Critique: pointsification and dark patterns

Finally, the critique – because game-based learning has a shadow, and naming it is part of using it well. Ian Bogost's charge of pointsification (he also called it "exploitationware") is that much so-called gamification is the laziest, most cynical layer of games – points and badges stripped of everything that makes games meaningful – bolted onto work to manufacture compliance. Such designs lean on extrinsic rewards and can erode the very intrinsic motivation the theory tells us to protect. Worse, the commercial games our learners play at home are full of dark patterns: *mechanics engineered not to teach but to maximise time and spending – variable rewards, manufactured urgency, loss aversion, pay-to-progress*. To bring games into inclusive education responsibly is therefore to be able to tell the difference: *between a design that serves the learner's autonomy, competence and relatedness, and one that harvests their attention*. The test is the one we have carried since Module 1: *does the design serve the learner's participation and dignity – or only their engagement?*

Accessibility of game mechanics (plan before use)

- Controls: remappable inputs; alternatives to speed, precision and rapid repetition; support for switches and assistive devices.
- Difficulty: adjustable levels and dynamic difficulty; the option to slow down, pause or retry without penalty.
- Perception: never rely on a single sense; avoid color-only cues; offer captions, clear icons and readable text.
- Cognition: plain language; clear goals; reduced time pressure; the option to turn off distracting effects.
- Data and commerce: no manipulative monetization or dark patterns in tools used with children; confirm GDPR compliance.

Important note (for the facilitator)

Lecture duration: 20–25 minutes; devote the remainder of the first lesson to questions and discussion. Open with the three-way distinction – ask the group for an example of each

(gamification, game-based learning, serious game) from their own practice, and one that is really just pointsification. Emphasize the core idea: *design for autonomy, competence and relatedness, not for points*. Replace the example scenarios with cases from your own setting. Close with the Module 1 test – does the design serve participation and dignity, or only engagement?

Workshops and Reflection (Lessons 2 and 3)

Workshop 1: Gamification or game-based learning? (45 min)

Aim: to tell the three concepts apart and to move a weak, points-only design towards one that serves autonomy, competence and relatedness.

Procedure:

- In pairs, participants receive three short examples of "gamified" classroom activities (mostly points and badges bolted on).
- For each, they classify it (gamification / game-based learning / serious game) and judge honestly: *is it really pointsification?*
- They redesign one example so that the learning is built into the play and the three needs are met – and name which extrinsic rewards they would remove, and why.
- In the plenary, pairs share one redesign and the reward they cut.

Format: pair work, then plenary exchange.

Output: for each example, a classification and honesty check; one worked redesign with rewards removed.

Workshop 2: Flow and accessibility review (45 min)

Aim: to review a game-based activity for the challenge–skill balance and for the accessibility of its mechanics, and to improve it.

Procedure:

- Groups choose (or are given) a short game-based or serious-game activity.

- They map it onto the flow channel for a specific learner: where would this learner sit – flow, anxiety or boredom – and how could difficulty adjust to keep them in the channel?
- They review the mechanics against the Game Accessibility Guidelines (controls, difficulty, perception, cognition): which learners does the game lock out?
- They propose two concrete adaptations and note who each adaptation includes.

Format: work in groups of 3–4.

Output: a redesigned activity with a difficulty-adjustment plan and two accessibility adaptations.

Reflection: My stance (45 min)

Each participant writes an answer to:

- In my practice, do I motivate myself with rewards (points, prizes) or with the activity itself – and what would change if I removed the rewards tomorrow?
- For one learner I know, where does a game I use sit on the flow channel – and does its design serve their participation, or only their engagement?

Additional question (critical digital pedagogy): where have I seen a dark pattern or pointsification in a tool used with learners, and what would I change before using it?

Bridge to Module 4

We now have three lenses: the inclusive stance, the immersive medium and the motivating structure of play. The next question is how to design a learning activity that draws on all of them deliberately, rather than by luck. Module 4 turns to designing learning activities with VR, with the same test throughout: does the design serve the learner's participation and dignity – or only their attention?

Module 4: Designing Learning Activities with VR

Structure (3 lessons): Lesson 1 – introductory lecture; Lessons 2–3 – workshops and reflection.

Module Objectives

By the end of the module, participants:

- apply backward design (Wiggins and McTighe) and constructive alignment (Biggs) – goal first, technology last;
- use the Cognitive-Affective Model of Immersive Learning (CAMIL) to design for the processes through which immersion teaches;
- write UDL into the design from the start, rather than retrofitting accessibility;
- apply principles of embodied design (Johnson-Glenberg), using gesture and movement as carriers of meaning, for the range of bodies present;
- use task analysis and chaining for life skills, and design deliberately for near and far transfer;
- co-design activities with learners, not only for them ("nothing about us without us");
- build ethics and privacy by design into the lesson plan from the start.

Introductory Lecture (Lesson 1)

Modules 1 to 3 gave us a stance, a medium and a motivational structure. Module 4 is where they become a plan: *how to design a learning activity with VR deliberately, so that the technology serves a goal rather than dictating one.* Throughout, we keep the question we have carried from the start: does the design serve the learner's participation and dignity, or only their attention?

Start with the goal, not the headset

The most common mistake in educational technology is to start from the tool – "we have VR headsets, what can we do with them?" – and work backwards to a justification. Backward design (Wiggins and McTighe) insists on the opposite order. First, identify the desired result: *what should this learner be able to do, understand or feel?* Second, determine acceptable evidence: *how will we know they can?* Only third do we plan the learning experiences – and

only here does technology enter, chosen because it serves the goal, not because it is available. Biggs's constructive alignment adds the discipline that holds this together: objectives, assessment and activities must form one aligned whole, each pointing at the same target. For our learners this order is not pedantry; it is protection. It stops the dazzle of immersion from setting the goal and keeps VR a means, never the end. The question that opens every design is not "what can the headset do?" but "what does this learner need to be able to do – and is VR the means that lowers the barrier, or merely the one that impresses?"

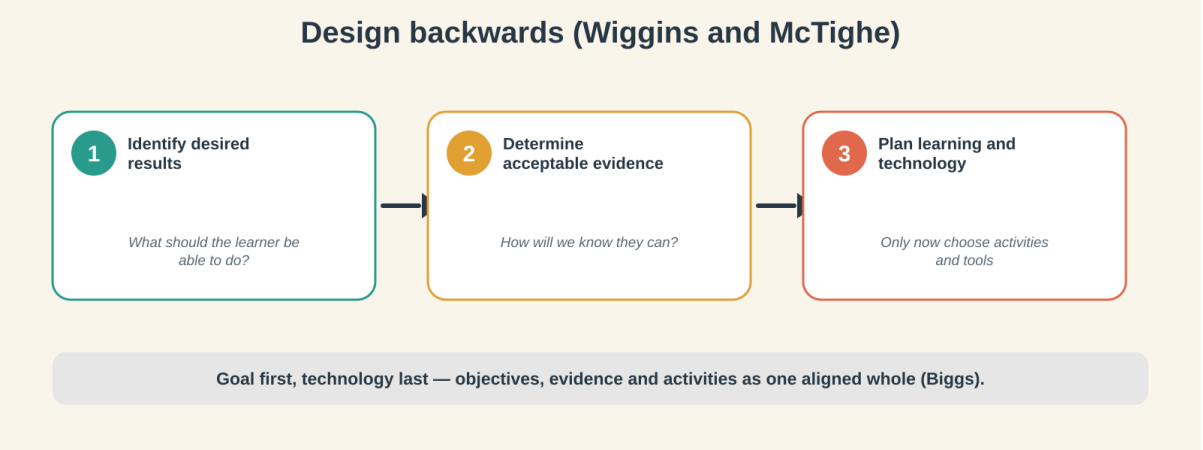


Figure 8: Backward design: results, then evidence, then – last of all – activities and technology

How immersion actually teaches

Why would an immersive activity teach better than a video or a worksheet? For years the answer was hand-waving – "it is more engaging." Makransky and Petersen's Cognitive-Affective Model of Immersive Learning (CAMIL, 2021) replaced the hand-waving with a mechanism. It says immersion does not teach directly. It offers two affordances – presence (the sense of being there, from Module 2) and agency (the sense of acting, of the world responding to me). These two affordances set in motion a set of cognitive and affective processes – interest, intrinsic motivation, self-efficacy, embodiment, cognitive load and self-regulation – and it is these processes, not the immersion itself, that produce learning. The design lesson is precise and freeing: we do not design "immersion"; we design for the processes that immersion can switch on, and we watch the one it can switch off – cognitive load. CAMIL is, in effect, the engineering diagram beneath everything in Module 2, and it tells us where to aim.

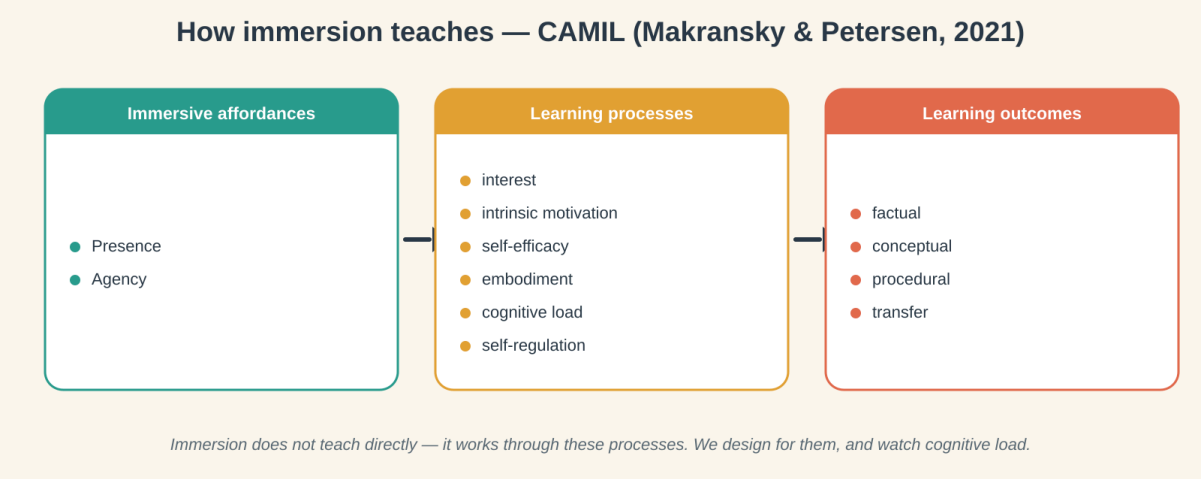


Figure 9: CAMIL: immersion's affordances (presence, agency) drive learning processes, which drive outcomes

UDL as design grammar

Universal Design for Learning returns here not as a topic but as a grammar – the language in which the whole activity is written. The temptation in immersive design is to build one polished experience and then, at the end, "make it accessible." UDL insists on the reverse: multiple means of engagement, of representation, and of action and expression are built into the design from the first sketch, not retrofitted. In a VR activity this means more than one way to be motivated (choice, relevance, adjustable challenge), more than one way to perceive the content (visual, audio, caption, haptic), and more than one way to act and to show learning (gesture, controller, switch, voice, spoken or drawn response). Retrofitted access is always thinner than designed-in access; the ramp added after the stairs is never as good as the level entrance planned from the start. In inclusive design, UDL is not a checklist at the end – it is the syntax of the whole.

Embodied design

If VR is above all a medium of the body (Module 2), then good VR design is embodied design. Johnson-Glenberg's principles hold that in immersive learning, movement and gesture are not decoration around the content – they can be carriers of the content itself. A learner who traces the shape of a molecule with their hands, who steps physically through a sequence, who mimes an action, may encode it more deeply than one who only watches, because the body is part of the thinking. The design implication is to ask, for each idea: is there a gesture

that means this? – and to make that gesture the mechanic. But embodiment also carries a duty we already know: *bodies differ*. A design that requires standing, two hands, a wide reach or fine motor precision has built a barrier into its very mechanic. Embodied design is powerful precisely because the body is involved – which is exactly why it must be designed for the range of bodies in the room.

Task analysis, chaining and transfer

For many of our learners the goal is a concrete life skill – crossing a road, using public transport, handling money, a job routine – and here immersive design meets an older, rigorous craft. Task analysis breaks a complex skill into its ordered, teachable steps; chaining teaches those steps in sequence, forwards or backwards, each success cueing the next. VR is an unusually good place to do this: *the steps can be rehearsed safely, repeatedly and with immediate feedback, in a setting that looks like the real one*. But the whole point of a life skill is that it must leave the headset – and so this section names the module's hardest question: transfer. Near transfer, to a very similar situation, is easier; far transfer, to the messy, variable real world, is the real aim and the harder one. Designing for transfer is deliberate: *varying the practice so it is not tied to one virtual street, and – without exception – bridging to practice in the real setting*. A skill mastered only in VR is not yet a skill; it is a rehearsal awaiting its performance.

Co-design: nothing about us without us, in design too

Module 1's principle – nothing about us without us – was about decisions. Here it becomes a method. Participatory or co-design means designing the activity with learners, not only for them: *involving them, and those who know them well, as partners in shaping the experience from the early sketches, not only as testers at the end*. This is not a courtesy; it is how the design gets better. The learner knows things the designer cannot – what overwhelms, what motivates, what a gesture feels like from the inside, where the barrier really is. To design an inclusive experience without the people it is for is to reproduce, in the design process itself, the very exclusion the experience is meant to undo. Co-design is the emancipatory stance of Module 1, arriving at the drawing board.

Important caution: the skill must leave the headset (transfer)

The most seductive failure in immersive design is the activity that works beautifully inside VR and nowhere else. A learner who can cross the virtual road flawlessly has, so far, learned to cross the virtual road.

Design for transfer from the start: vary the practice (many streets, not one), reduce the supports gradually, and – without exception – bridge to guided practice in the real setting. Treat the VR experience as a rehearsal, and plan the performance. If there is no plan to move the skill out of the headset, the design is not yet finished.

Ethics and privacy by design

Finally, the safeguards. As in Module 2, immersive tools can capture intimate data – where a learner looks, how they move, how they respond – and they act on children, often vulnerable ones. The principle here is ethics and privacy by design: *protections are built into the lesson plan from the start, not bolted on at the end*. That means deciding, before the activity is built, what data is truly needed (and collecting no more), who can see it, how long it is kept, and how the learner and their family consent and can say no. It means designing for psychological safety as deliberately as for learning – an easy exit, learner control, no coercion, no manufactured distress. Privacy and ethics added at the end are always weaker than those designed in – the same truth as accessibility, the same truth as UDL. In inclusive design, the safeguard is part of the architecture, not the paint.

Ethics and privacy by design (decide before building)

- Purpose: name the learning goal the data serves, and collect nothing beyond it (data minimisation).
- Consent: how the learner and family are informed, consent, and can decline or stop at any time.
- Access and retention: who sees the data, how it is protected, how long it is kept; GDPR compliance for any biometric data (gaze, movement).
- Psychological safety: an easy exit, learner control, no coercion or manufactured distress.

- Co-design: the learner (and those who know them) shaped the design, not only tested it at the end.

Important note (for the facilitator)

Lecture duration: 45 minutes; devote the remainder of the first lesson to questions and discussion. Open by resisting the tool: ask the group to name a learning goal first, before anyone mentions a headset. Emphasise the module's spine – backward design (goal, then evidence, then technology) and CAMIL (immersion works through processes, not by itself). Replace the example scenarios with cases from your own setting. Close with the Module 1 test – does the design serve participation and dignity, or only attention?

Workshops and Reflection (Lessons 2 and 3)

Workshop 1: Design backwards (45 min)

Aim: to plan a small immersive activity in the correct order – goal, then evidence, then technology – and to check that the three are aligned.

Procedure:

- In pairs, participants take a real learning goal for a specific learner (or use a supplied one).
- Step 1 – state the desired result: what the learner should be able to do.
- Step 2 – state the evidence: how they will know it is achieved.
- Step 3 – only now choose the activity and technology, deciding whether VR is the means that lowers the barrier or a lighter point on the reality–virtuality continuum (Module 2) would serve.
- They check constructive alignment: do goal, evidence and activity point at the same target?
- In the plenary, pairs share one case where designing backwards changed – or removed – the technology they first imagined.

Format: pair work, then plenary exchange.

Output: a one-page backward-design outline (result → evidence → activity/technology) with an alignment check.

Workshop 2: CAMIL and UDL design review (90 min)

Aim: to review a draft immersive activity through CAMIL and UDL, and to improve it – including embodiment, transfer and one safeguard.

Procedure:

- Groups take a draft VR activity (their own or supplied).
- Through CAMIL: which processes does it use (interest, motivation, self-efficacy, embodiment, self-regulation) – and where does it risk overloading (cognitive load)?
- Through UDL: is there more than one way to engage, to perceive, and to act and express – built in, not added?
- Embodiment: is there a gesture that carries the meaning, and can the range of bodies in the room perform it?
- Transfer and ethics: how will the skill leave the headset, and which one privacy or ethics safeguard is built in?
- They propose two concrete design changes and note who each change includes.

Format: work in groups of 3–4.

Output: a revised design brief with two changes, a transfer plan and one built-in safeguard.

Reflection: My stance (45 min)

Each participant writes an answer to:

- When I design, do I start from the goal or from the tool – and what would change if the technology had to earn its place every time?
- For one activity I use, would co-designing it with a learner change it – and what have I assumed on their behalf?

Additional question (critical digital pedagogy): what data does a tool I use collect, and would ethics-and-privacy-by-design change whether, or how, I use it?

Bridge to Module 5

A well-designed activity still has to survive contact with a real classroom – its constraints, its safeguards, its unpredictable days. Module 5 turns to implementation and safety: how to bring the design into the room responsibly, from teacher knowledge (TPACK, SAMR) to children's rights, health and data protection – with the same test we have carried throughout: does it serve the learner's participation and dignity, or only their attention?

Module 5: Classroom Implementation and Safety

Structure (3 lessons): Lesson 1 – introductory lecture; Lessons 2–3 – workshops and reflection.

Module Objectives

By the end of the module, participants:

- distinguish fidelity from adaptation and practise meaningful adaptation; understand technology adoption as change management;
- use TPACK (Mishra and Koehler) to locate the goal in the overlap of technology, pedagogy and content, and use SAMR critically – as vocabulary, not a ladder;
- apply children's rights in the digital environment (General Comment No. 25) and hold protection and participation together;
- carry out the health-and-safety checks specific to immersive and screen-based tools (photosensitive epilepsy, cybersickness, age recommendations, sensory processing, hygiene);
- apply data protection in law and ethics – GDPR special categories and biometric data, data minimisation, and the critique of surveillance;
- manage a classroom with technology (station rotation, blended models) and secure equity of access at the point of use;
- protect psychological safety and autonomy – consent and assent, and the right to withdraw at any time.

Introductory Lecture (Lesson 1)

Modules 1 to 4 gave us a stance, a medium, a motivational structure and a design method. Module 5 is where the design meets the classroom – its constraints, its safeguards and its unpredictable days. A good activity that is implemented carelessly, or unsafely, is not a good activity. Throughout, we keep the question we have carried from the start: does it serve the learner's participation and dignity, or only their attention?

Fidelity and adaptation

A well-designed activity does not implement itself. Implementation science studies why good ideas so often fail in real settings – and its central tension is one every teacher knows: *fidelity versus adaptation*. Fidelity means delivering an approach as designed, so that what made it work is preserved; adaptation means adjusting it to the real learners, room and day in front of you. Too much fidelity and the activity becomes rigid, deaf to the learner; too much adaptation and it quietly loses the ingredients that made it effective. The skill is meaningful adaptation: *changing the surface while protecting the core.* Bringing technology into a school is also change management – it touches routines, roles, fears and workloads, and it succeeds or fails less on the quality of the tool than on how the change is led: *with the people, not at them*. The best headset in the store will gather dust if the staff who must use it were never part of the decision.

Tpack and the critical use of SAMR

What does a teacher actually need to know to use technology well? Mishra and Koehler's TPACK framework answers: *not technology on its own, but the meeting of three knowledges – technological, pedagogical and content – and especially their overlap*. Knowing the tool is not enough; knowing the subject is not enough; the art is technological pedagogical content knowledge, the judgement to choose the right tool for this content, taught this way, to these learners. TPACK is a map of the teacher's expertise, and it locates the goal at the centre, in the overlap, not in any single circle.

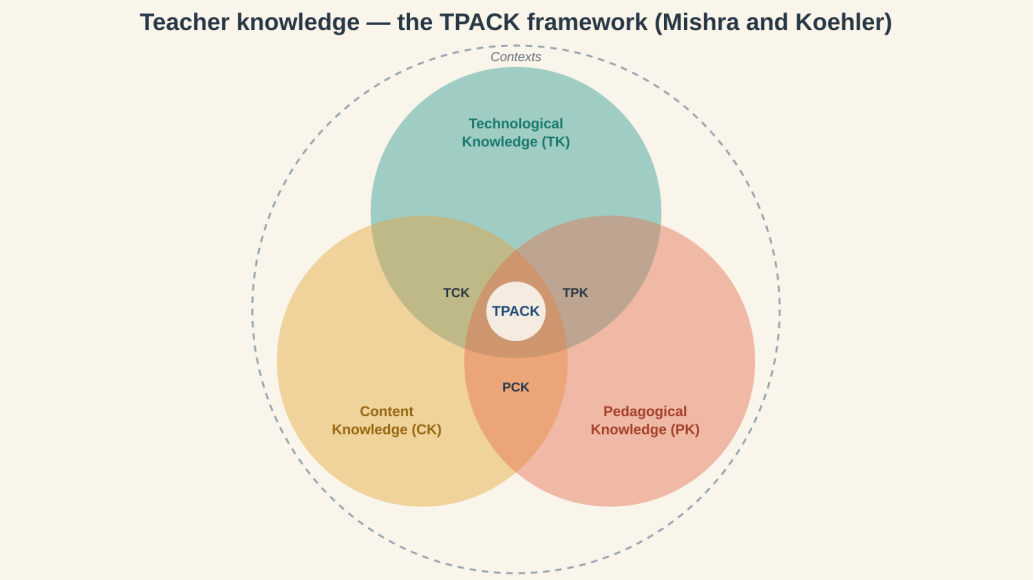


Figure 10: TPACK: the goal lives in the overlap of technological, pedagogical and content knowledge – within its contexts

SAMR (Puentedura) offers a second, popular vocabulary – substitution, augmentation, modification, redefinition – for how deeply a technology reshapes a task. It is useful for naming what a tool actually changes. But we use it critically: SAMR is often read as a ladder to climb, as if "redefinition" were always better than "substitution" – and that is a trap. Higher is not automatically better. Sometimes the humble, "mere" substitution is exactly what a learner needs, and reaching for transformation adds barriers, not learning. The measure is never the rung; it is the learner.

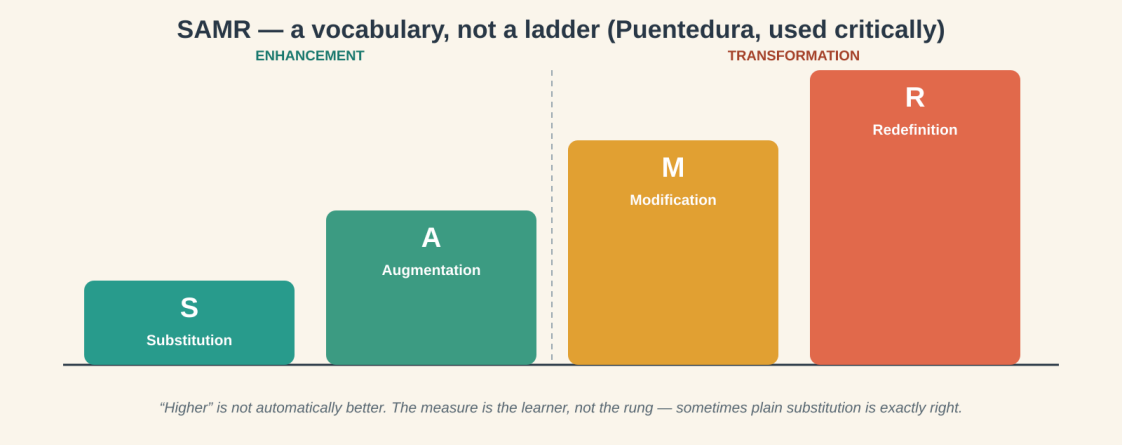


Figure 11: SAMR read critically: a vocabulary for what a tool changes, not a hierarchy in which higher is better

Safeguarding and duty of care

Every technology we bring to a child arrives inside a duty of care. The clearest guide is the UN Committee on the Rights of the Child's General Comment No. 25 (2021), which sets out that children's rights apply fully in the digital environment – the same protection, provision and participation they are owed offline, they are owed online. Crucially, it holds together two things that are easy to split: children have a right to be protected from harm in digital spaces, and a right to access and participate in them – so safeguarding must not become a blanket exclusion that shuts vulnerable children out of the digital world. For us this means the duty of care is not only to shield, but to include safely: to ask, for every tool, both "is this safe?" and "does refusing it exclude this child from something they have a right to?" The answer is rarely "ban" or "allow"; it is "make safe and include."

Health and safety

Immersive and screen-based tools carry specific, physical risks that must be checked before use, not discovered during it. Flashing light and certain patterns can trigger photosensitive epilepsy in susceptible learners. Head-mounted VR can cause cybersickness – the sensory mismatch of Module 2 – and manufacturers set minimum age recommendations for good developmental reasons that are not optional. Many autistic learners have particular sensory-processing profiles, so an experience that is neutral for one child can be overwhelming for another – the sound, the light, the closeness, the weight of a headset on the face. And shared devices raise plain hygiene. None of this is a reason to refuse the technology; all of it is a reason to plan. The health-and-safety base is a pre-flight check: know each learner's medical and sensory profile, screen the content, set time limits, keep an easy exit, and clean the equipment. Safety here is not caution added to the lesson; it is a precondition of it.

Data protection in law and ethics

The law and the ethics point the same way. Under the GDPR, some data belongs to special categories that demand extra protection – including health data and biometric data used to identify a person. Immersive tools make this acute: a headset can capture how a learner

looks, moves and reacts, even physiological signals – data that is intimate, revealing and hard to anonymise. The legal principle of data minimisation is also the ethical one: collect only what the learning actually requires, and no more. And beyond the law sits the wider critique we met in Module 1 – the datafication of the child, the drift towards surveillance in which every action becomes a measurement. To use these tools responsibly is to resist that drift: to ask not "what could we collect?" but "what is the least we need?", to know where the data goes, and to be willing to choose a tool that sees less. The most protective data policy is the data never gathered.

Managing a classroom with technology

How does this work with a whole class and one teacher? Rarely as "everyone in a headset at once." The models from Module 1 return as management tools: *station rotation, where a small group uses the immersive station while others work differently, and blended arrangements that mix the digital with the human.* This is not only practical but pedagogical – it keeps the technology one station among several, not the centre of gravity. And it raises a quiet question of justice at the point of use: within the room, who actually gets the time, the working device, the support to use it well? Equity is not only about which school can afford headsets; it is about whether, in this classroom, the learner who would benefit most is the one who gets the turn – or the one who is easiest to leave on the tablet in the corner. Managing technology well is, in part, managing this fairness minute by minute.

Important caution: safeguarding must not become exclusion

Faced with real risks, it is tempting to keep the most vulnerable learners away from technology altogether. General Comment No. 25 warns against exactly this: children have a right to protection in digital spaces and a right to access and participate in them. Blanket exclusion "to be safe" can itself be a harm – one more locked door for the child already facing the most.

The responsible question is not "ban or allow?" but "how do we make this safe enough to include this child?" Duty of care means both shielding from harm and safeguarding the right to take part. When we exclude, we should be as able to justify it as when we include.

Psychological safety and autonomy

Finally, the learner's own authority over the experience. Two ideas govern it. Consent is the formal, legal permission – usually from parents or carers, informed and specific. Assent is the child's own agreement – their willingness, in their own terms, which we seek even when they cannot give legal consent, and which we honour. A learner who has consent on file but does not want the headset on their face is telling us something we must respect. And overriding all of it is the right to withdraw at any time, without penalty and without needing a reason: the exit is always open, and using it is never failure. This is not a bureaucratic add-on; it is the deepest form of the stance we have carried since Module 1 – that the learner is a subject, not an object of our intervention. A technology used on a child who cannot say no is not inclusive, however sophisticated. The first safeguard is the word "stop", honoured the instant it is spoken.

Before you press play: a safety and rights check

- Health: check each learner's medical and sensory profile (photosensitive epilepsy, cybersickness history, sensory processing); observe age recommendations; screen the content.
- Comfort and exit: set time limits; keep an easy, immediate exit; no coercion; clean shared equipment.
- Data: collect only what the learning needs (data minimisation); know where any biometric or health data goes; confirm GDPR compliance; prefer tools that see less.
- Consent and assent: informed consent from parents or carers, and the child's own assent; honour a "no" even where consent exists.
- Equity at the point of use: make sure the learner who would benefit most actually gets the turn, the working device and the support.

Important note (for the facilitator)

Lecture duration: 20–25 minutes; devote the remainder of the first lesson to questions and discussion. Open with a real implementation that failed – a tool that arrived and was never used – and ask why: almost always the answer is people and process, not the tool. Emphasise the two anchors: TPACK (the goal is the overlap, not the technology) and the right to withdraw (the first

safeguard). Use SAMR as vocabulary, not a ladder. Replace the examples with cases from your own setting. Close with the Module 1 test – does it serve participation and dignity, or only attention?

Workshops and Reflection (Lessons 2 and 3)

Workshop 1: Fidelity or adaptation? (45 min)

Aim: to distinguish changes that protect an approach's core from changes that quietly hollow it out, and to plan a safe, fair rollout.

Procedure:

- In pairs, participants take a designed activity (from Module 4 or supplied) and a real classroom constraint (limited time, one headset, a learner who cannot stand, a nervous colleague).
- They list the adaptations they would make – and mark each as protecting the core or risking it (meaningful adaptation vs drift).
- They add a change-management note: who needs to be involved, informed or reassured for this to actually happen?
- In the plenary, pairs share one adaptation they would refuse to make, and why.

Format: pair work, then plenary exchange.

Output: an adaptation plan marked core-protecting / core-risking, with a short change-management note.

Workshop 2: Before you press play – a safety and rights review (45 min)

Aim: to run a real activity through the health, data, rights and consent checks before it is used, and to fix what fails.

Procedure:

- Groups take an immersive or digital activity they might actually use.
- They work through the safety-and-rights check (health, comfort and exit, data, consent and assent, equity), flagging every point that is unmet.

- Using General Comment No. 25, they decide whether any learner is being excluded "for safety" – and how to include them safely instead.
- They propose the two changes that most reduce risk while keeping the learner included.

Format: work in groups of 3–4.

Output: a completed safety-and-rights check with the two highest-priority fixes and an inclusion decision.

Reflection: My stance (45 min)

Each participant writes an answer to:

- When technology enters my room, do I lead the change with my colleagues and learners, or impose it – and what is one thing I would do differently?
- For one learner, have I ever kept them from a tool "to be safe" in a way that also excluded them – and could I have included them safely instead?

Additional question (critical digital pedagogy): what data does a tool I use gather about my learners, and what is the least I actually need?

Bridge to Module 6

An activity that is well designed and safely implemented still leaves the last question: did it help – and how would we know, in a way that respects the learner? Module 6 turns to assessment, monitoring and reflection: assessment for learning, ipsative and goal-based approaches, the ethics of learning analytics, and the reflective practice that lets us learn from our own teaching – with the same test we have carried from the start: does it serve the learner's participation and dignity, or only their attention?

Module 6: Assessment, Monitoring and Reflection

Structure (3 lessons): Lesson 1 – introductory lecture; Lessons 2–3 – workshops and reflection.

Module Objectives

By the end of the module, participants:

- distinguish assessment of learning from assessment for learning (Black and Wiliam), and normative from ipsative (self-referenced) assessment;
- use Goal Attainment Scaling and curriculum-based measurement to track individual goals;
- apply universal design for assessment and authentic assessment (portfolios; multiple means of showing knowledge);
- appraise learning and multimodal analytics critically – algorithmic bias, surveillance, the critique of emotion recognition – and hold to "the measurable is not the meaningful";
- practise reflective practice (Schön; Gibbs' cycle), reflecting in and on action;
- build and sustain professional learning through communities of practice (Wenger);
- centre learner voice and self-assessment (with AAC and participatory assessment), placing dignity before quantification.

Introductory Lecture (Lesson 1)

Modules 1 to 5 gave us a stance, a medium, a motivational structure, a design method and a way to implement it safely. Module 6 asks the last and most searching question: did it help – and how would we know, in a way that respects the learner rather than reducing them? This is the module where assessment meets ethics, and where the question we have carried from the start reaches its sharpest form: does what we do serve the learner's participation and dignity, or only their attention?

Assessment for learning and ipsative assessment

Assessment comes in two spirits. Assessment of learning judges and ranks – a verdict at the end. Assessment for learning (Black and Wiliam) does something different: it feeds back into

the teaching while there is still time to act, using evidence of where a learner is to decide what to do next. It is assessment as a servant of learning, not its judge. And for our learners a second distinction is decisive: *normative versus ipsative assessment*. Normative assessment measures a learner against a norm – against other children of their age – and for a child with special needs the verdict is often, unfairly and uselessly, "behind." Ipsative, or self-referenced, assessment measures the learner against themselves – against where they were last month. It asks not "how does this child compare to others?" but "how far has this child come?" For many of our learners this is not a technicality; it is the difference between an assessment that says "you fail" and one that says "you are growing." The first crushes; the second teaches. Ipsative assessment is the epistemic-justice stance of Module 1, arriving at the report.

Goal attainment scaling and curriculum-based measurement

How do we measure progress towards a goal that is this learner's own, not the curriculum's average? Two tools help. Goal Attainment Scaling sets, in advance and with the learner, a personalised ladder for a specific goal – from "much less than expected" through "the expected outcome" to "much more" – so that progress can be tracked against that individual target rather than a class norm. Curriculum-based measurement takes brief, frequent, direct samples of performance on the actual curriculum content, so that a learning trend becomes visible early and teaching can respond. Both share the logic of Module 4's backward design: *name the goal first, then measure against it*. And both are, at heart, ipsative – they honour the individual target. Used well, they make progress visible for a learner whose growth a norm-referenced test would render invisible; used carelessly, they become just another number. The tool is only as humane as the goal it serves.

Universal design for assessment and authentic assessment

If UDL is the grammar of the whole course, it does not stop at the lesson and resume at the test. Universal design for assessment insists that learners have more than one way to show what they know – because a single fixed format does not measure the knowledge, it measures the learner's fit to the format. A child who understands but cannot write, or cannot speak, or cannot sit a timed exam, is failed by the format, not by any lack of

knowledge. Authentic assessment goes further It asks the learner to demonstrate learning in a real, meaningful task rather than an artificial test – and portfolios gather that evidence over time, in many forms: *a made thing, a recorded performance, a photograph, a project*. For our learners this is not leniency; it is accuracy. An assessment that lets a learner show knowledge in the way they can is simply a truer measurement than one that does not. Access to the assessment is part of the validity of the assessment.

Learning analytics and the ethics of measurement

Immersive and AI tools promise a new kind of evidence. Learning analytics gathers the digital traces of learning; in immersive environments, multimodal analytics can capture far more – where a learner looks, how long they hesitate, how they move, how they interact. This is powerful, and it is dangerous, and the two cannot be separated. The dangers are concrete: algorithmic bias, where a model trained on some learners misjudges others; surveillance, where rich measurement slides into constant watching; and the particular case of emotion recognition – systems that claim to read a child's feelings from face or voice, a claim the science does not support and which is especially perilous with autistic learners whose expression may not match the model's assumptions. Beneath all of it sits one sentence that should govern the whole module: the measurable is not the same as the meaningful. It is easy to measure gaze and clicks and time; it is hard to measure understanding, wellbeing, dignity, the quality of a relationship – and the danger is that we come to value what we can measure and quietly stop valuing what we cannot. To use analytics responsibly is to keep the measurable in its place: a servant of the meaningful, never its replacement.

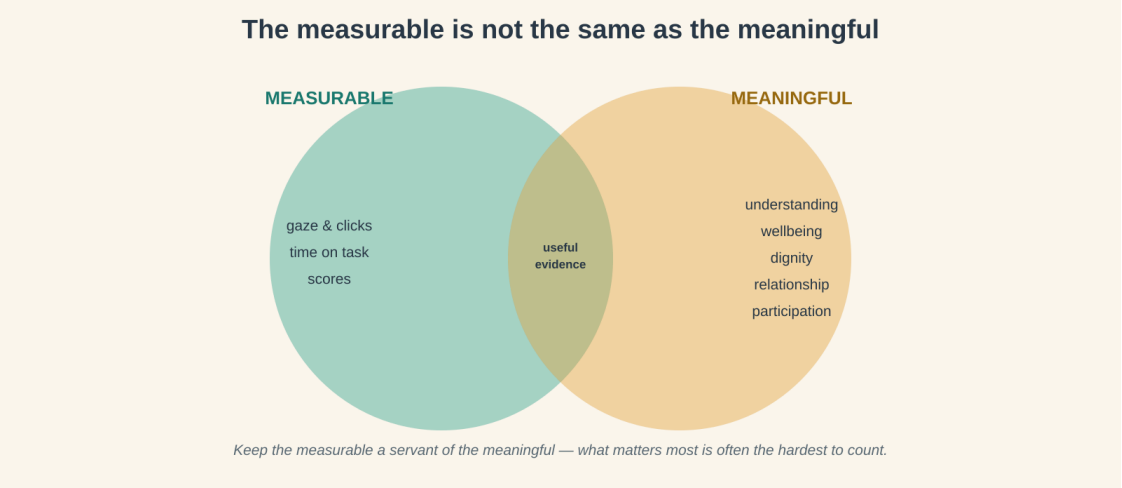


Figure 12. Much of what is easiest to measure is not what matters most; much of what matters most cannot be measured at all.

Important caution: measurable is not meaningful

Immersive and AI tools can measure a great deal – gaze, movement, hesitation, clicks, time. But the ease of measuring these should not fool us into valuing them. Claims to read a learner's emotions from face or voice are not supported by the science and are especially unreliable for autistic learners; and rich measurement can quietly become surveillance.

Keep the measurable in its place. Ask, of any metric: does this actually tell me something meaningful about this learner's understanding, wellbeing or growth – or is it merely easy to collect? What matters most about a learner is usually the hardest to measure. Value it anyway.

Reflective practice

So far, we have assessed the learner. Now we turn the assessment on ourselves – for the most important evaluation in the module is the teacher's evaluation of their own practice. Schön describes the reflective practitioner as one who thinks in two tenses: reflection-in-action, the thinking we do in the moment, adjusting as we go; and reflection-on-action, the thinking we do afterwards, learning from what happened. Gibbs' reflective cycle gives this a usable shape – description, feelings, evaluation, analysis, conclusion, action plan – a loop that turns an experience into a lesson and the lesson into a changed next time. This is not paperwork; it is how a teacher keeps growing rather than merely repeating. And it models, for the learner, exactly what we ask of them: to look honestly at what happened, without shame, and to decide what to do next.

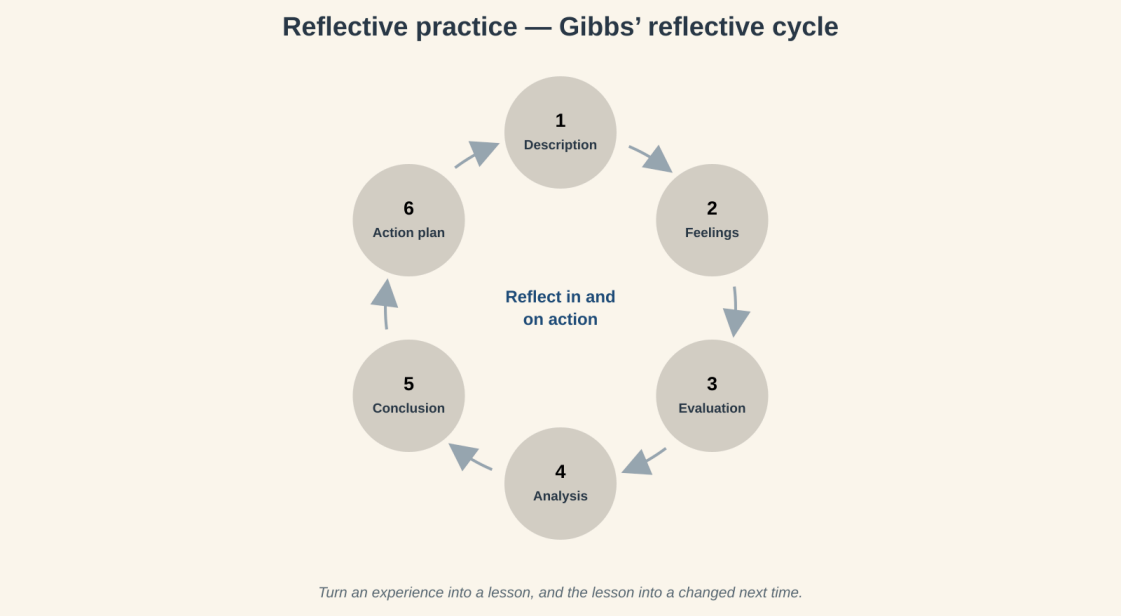


Figure 13. Gibbs' reflective cycle: a repeatable loop from experience to a changed next time.

Communities of practice

No teacher reflects best alone, and no training ends learning. Wenger's communities of practice describe how professionals learn continuously by belonging to a group that shares a craft – swapping cases, problems and solutions, holding a shared repertoire, learning from one another over time. This matters especially now, at the end of a training: *the deepest professional learning happens not in the course but in what follows it – in the staffroom conversation, the shared problem, the colleague who tried it first*. A community of practice is how the ideas of these six modules stay alive after the last session, adapting to real classrooms and real learners. The training plants; the community grows. If there is one structure worth building after this course, it is not a policy but a group – a place where practitioners keep thinking together.

Learner voice, self-assessment and dignity

Finally, and most importantly, the learner is not only the object of assessment but its subject. Learner voice means the child has a say in the evaluation of their own learning – and self-assessment means they take part in judging it, which is itself one of the most powerful drivers of learning. For learners who do not speak, this is made possible through augmentative and alternative communication and through participatory assessment

designed with them, so that their perspective counts even when it is not spoken in words. This is the whole course returning to where it began: nothing about us without us, arriving at the last and most sensitive place – the judgement of the child. And it carries a warning that should close the module and the handbook alike: dignity comes before quantification. A child is not a data point, a score, a set of gaze-tracks. Before we measure, we should ask whether measuring serves this child or only our records – and we should be willing, sometimes, not to measure at all. The final assessment of any assessment is whether it honours the learner as a person. That, and not the number, is the point.

Assessing with dignity: a check before you measure

- Ipsative first: measure the learner against their own progress, not only against a norm.
- Multiple means: let the learner show what they know in more than one way (universal design for assessment; portfolios).
- Individual goals: track named, personalised goals (Goal Attainment Scaling), not only averages.
- Data minimisation: collect the least that genuinely informs teaching; be wary of gaze and emotion data; confirm GDPR and consent.
- Learner voice: involve the learner (with AAC where needed) in assessing their own learning.
- The final question: does this assessment serve the learner, or only our records? If only the latter, reconsider.

Important note (for the facilitator)

Lecture duration: 20–25 minutes; devote the remainder of the first lesson to questions and discussion. Open with two reports on the same child – one norm-referenced ("below the expected level") and one ipsative ("has moved from X to Y") – and ask which one teaches. Emphasise the module's sentence: the measurable is not the same as the meaningful. Model reflective practice by reflecting aloud on your own teaching of these modules. Replace the examples with cases from your own setting. Close by returning, one last time, to the question that has run through all six modules – does it serve the learner's participation and dignity, or only their attention?

Workshops and Reflection (Lessons 2 and 3)

Workshop 1: Norm or self? Rewriting an assessment (30 min)

Aim: to turn a norm-referenced judgement into an ipsative, goal-based one that makes a learner's progress visible and teaches from it.

Procedure:

- In pairs, participants take an anonymised assessment statement written in norm-referenced terms ("below the expected level for their age").
- They rewrite it ipsatively: against the learner's own prior performance and a named individual goal, using a simple Goal Attainment Scale.
- They add one "assessment for learning" next step – what the evidence tells them to do next.
- They check: does the rewrite make the learner's growth visible, and does it protect their dignity?
- In the plenary, pairs share one rewrite and the difference it makes.

Format: pair work, then plenary exchange.

Output: an ipsative, goal-based reworking of an assessment statement with one next step.

Workshop 2: Measurable or meaningful? An analytics and dignity review (35 min)

Aim: to decide, for the data an immersive or AI tool could gather, what is worth collecting, what should be refused, and how to assess with dignity.

Procedure:

- Groups take an immersive or digital activity that could produce analytics (gaze, interaction, time, scores).
- They sort what it could measure into "measurable and meaningful", "measurable but not meaningful" (refuse or minimise), and "meaningful but not measurable" (value anyway, assess another way).

- They flag any emotion-recognition, surveillance or bias risk and decide how to handle it (data minimisation, consent).
- They add one way the learner's own voice enters the assessment (with AAC where needed).
- They propose the two changes that most protect the learner's dignity while keeping the assessment useful.

Format: work in groups of 3–4.

Output: a sorted data map with the two highest-priority dignity-protecting changes and one learner-voice route.

Reflection: My stance, and the whole course (25 min)

Each participant writes an answer to:

- Do my assessments tell my learners "you are behind" or "you are growing" – and what is one report or record I would rewrite?
- Across these six modules, what is the one change to my own practice I am most committed to making – and who is the community that will help me sustain it?

Additional question (critical digital pedagogy): what is one thing about my learners that matters deeply and cannot be measured – and how will I make sure I keep valuing it?

Closing the loop: the six modules, one question

Six modules have taken us from a stance to a medium, a motivation, a design, an implementation and an evaluation. One question has run through all of them, and it is the one to keep: does what we do serve the learner's participation and dignity – or only their attention? Every tool, every immersive world, every game, every metric answers it one way or the other.

The technology will keep changing; the question does not. If you carry one thing from this training, carry the question – and the habit of asking it out loud, with your colleagues and your learners, again and again.

5. Training Schedule

DAY 1: FOUNDATIONS	▯ Introduction ▯ Inclusive education ▯ VR basics
DAY 2: CREATION	▯ Game-based learning ▯ VR lesson design workshop
DAY 3: EXECUTION	▯ Classroom implementation ▯ Assessment methods ▯ Final presentations

DAY 1: FOUNDATIONS OF INCLUSIVE DIGITAL PEDAGOGY AND VIRTUAL REALITY

- Estimated duration: 8h
- Participants profile:

The first day of the training introduces the training programme and establishes the pedagogical basis for the use of Virutal Reality (VR) in special education. It includes a short introduction to the unBLOCKed project and training structure, followed by the first two modules of the training programme (Module 1: Inclusive Education and Digital Pedagogy and Module 2: Introduction to VR in Education).

The main purpose of the day is to help participants understand why VR and digital game-based learning can be useful in special education, while also reflecting on the needs, barriers and learning profiles of their students. By the end of the day, teachers should have a

first understanding of VR as an educational tool and should be able to connect one classroom challenge with a possible digital or VR-based learning activity.

Day 1 schedule

Time	Training block	Main purpose
8:30–9:00	Welcome and registration	Arrival, attendance registration and distribution of training materials
09:00–9:30	Introduction to the unBLOCKed training	Present the project, training objectives, three-day structure and expected participant outputs
9:30–11:00	Module 1: Inclusive Education and Digital Pedagogy — Part 1	Connect the training with participants' teaching contexts and introduce the inclusive approach
11:00–11:15	Coffee break	
11:15–12:45	Module 1: Inclusive Education and Digital Pedagogy — Part 2	Identify classroom barriers, learner needs and possible support measures
12:45–14:00	Lunch break	
14:00–15:30	Module 2: Introduction to VR in Education — Part 1	Present VR equipment, basic functions and educational possibilities
15:30-15:45	Coffee break	
15:45–17:00	Module 2: Introduction to VR in Education — Part 2	Explore VR or 360° environments and reflect on learner support, safety and supervision
17:00-17:30	Day 1 reflection and preparation for Day 2	Link the day's work with the game-based learning and lesson design activities planned for Day 2

Welcome and registration

Estimated duration: 15-30 minutes

Participants arrive, sign the attendance sheet and receive the training materials. Trainers use this time to check that all technical resources are prepared and that the room is ready for the first session.

Training arrangements:

- Attendance registration.
- Distribution of training agenda and materials.
- Informal welcome by trainers.
- Technical check of projector, internet connection and VR equipment.

Materials:

- Attendance sheet.
- Printed or digital agenda.
- Name tags, if needed.
- Training folder or shared digital folder.

Introduction to the Training

Estimated duration: 30–45 minutes

The day begins with a short introduction to the unBLOCKed project, the purpose of the Practical Teacher Training Guide and the structure of the three-day training programme.

Main points to cover:

- General introduction to the unBLOCKed project.
- Purpose of the teacher training.
- Overview of the three-day training structure.
- Expected practical outputs of the training.
- Participants' previous experience, expectations and concerns.

Suggested activities:

- Welcome and presentation of trainers and participants.
- Short presentation of the unBLOCKed project.
- Presentation of the training agenda.
- Quick round of expectations, doubts and previous experience.

Materials:

- Training agenda.
- Project presentation.
- Projector or screen.
- Sticky notes, flipchart or digital board.

Expected result:Participants understand the purpose of the training, the structure of the three days and the practical output they will develop during the programme.

Module 1: Inclusive Education and Digital Pedagogy

Estimated duration: 3 hours

This part of the day focuses on inclusive education and on the role of digital tools in supporting students with special educational needs.

The session should allow participants to connect the topic of inclusive digital pedagogy with their own professional context. Trainers guide participants to identify barriers that may affect students' participation and learning, and to consider what kind of support may be needed when digital tools are introduced in the classroom.

The session then introduces digital tools as possible supports for inclusion. VR and digital game-based learning are presented as tools that can provide visual support, repetition, structure, safe practice and active participation when they are used with clear educational objectives.

Materials:

- Module 1 Power Point presentation.
- Case study cards or examples.
- Reflection template.
- Whiteboard, flipchart or digital board.

Expected result:Each participant identifies one relevant barrier or learning need from their own classroom context.

Module 2: Introduction to VR in Education

Estimated duration: 4 hours

This part introduces the basic use of VR in education. The focus should remain practical and accessible, especially for teachers with little or no previous experience with VR.

Trainers present the basic equipment and functions, such as VR headsets, controllers, 360° environments and simple interactive scenarios. The session should focus on how VR can support learning in special education.

Participants explore examples of how VR can be used to practise daily routines, social situations, decision-making, public spaces or communication tasks in a safe and controlled environment. These examples should help participants understand the connection between VR, the unBLOCKed game and the project's learning areas.

If equipment is available, participants test a VR headset or explore a 360° learning environment in small groups. While one participant uses the equipment, the others observe the experience and discuss what kind of support a student might need before, during and after the activity.

Materials:

- VR headsets and controllers.
- Laptops or tablets.
- Internet connection, if required.

- Projector or screen.
- VR application or 360° learning environment.
- Cleaning materials for shared devices.

Expected result: Participants understand the basic use of VR equipment and identify one possible educational use of VR for students with special educational needs.

Closing Reflection

Estimated duration: 30 minutes

The day ends with a short reflection activity. Participants review the main points of the day and connect their identified student need or classroom barrier with the use of digital tools or VR in general terms.

This reflection will be used as the starting point for Day 2, where participants will work on game-based learning and VR lesson design.

Suggested reflection questions:

- What classroom barrier or student need did I identify today?
- How could a digital or VR-based activity help address it?
- What support would students need to participate safely?
- What would I like to develop further on Day 2?

Final output of Day 1:By the end of Day 1, each participant has completed a short reflection template including:

- one student need or classroom barrier
- one possible support or adaptation measure
- one initial idea or question to explore during Day 2.

This output will be used as the starting point for the game-based learning and VR lesson design workshop on Day 2.

DAY 2: CREATION

The second day of the training focuses on the practical use of digital game-based learning and the design of VR-supported learning activities. It builds on the reflections developed during Day 1 and helps participants move from identifying student needs and classroom barriers to planning concrete educational activities.

Day 2 includes Module 3 “Game-Based Learning for Special Education” and Module 4 “Designing VR Learning Activities”. The main purpose of the day is to help participants understand how game-based learning can support motivation, participation and repetition, and to guide them in the design of a simple classroom activity connected to the unBLOCKed learning areas and available project materials.

By the end of the day, participants should have a first draft of a VR-supported or digital game-based learning activity that can be further developed and reviewed during Day 3.

Day 2 schedule

Time	Training block	Main purpose
8:30–9:00	Recap of Day 1 and introduction to Day 2	Review the main conclusions from Day 1 and explain the objectives and practical work planned for Day 2
09:00–10:30	Module 3: Game-Based Learning for Special Education — Part 1	Introduce the basic principles of game-based learning and connect them with special education needs
10:30–10:45	Coffee break	
10:45–12:45	Module 3: Game-Based Learning for Special Education — Part 2	Analyse how game elements such as challenges, feedback, rewards and progression can support learning and participation
12:45–14:00	Lunch break	

14:00–15:30	Module 4: Designing VR Learning Activities — Part 1	Present the structure of a VR-supported learning activity and connect it with learning objectives, student needs and support measures
15:30–15:45	Coffee break	
15:45–17:00	Module 4: Designing VR Learning Activities — Part 2	Start the lesson design workshop and prepare a first draft of a VR-supported or digital game-based activity
17:00–17:30	Day 2 reflection and preparation for Day 3	Review the first draft of the activity and identify what needs to be improved before implementation and presentation

Recap of Day 1 and Introduction to Day 2

Estimated duration: 30 minutes

The day starts with a short recap of the main ideas from Day 1. Trainers invite participants to review the student need, classroom barrier or support measure they identified during the closing reflection of the previous day.

This first block also presents the objectives of Day 2. Trainers explain that the focus will move from understanding VR and inclusive digital pedagogy to planning how digital games and VR-supported activities can be used in a structured way in the classroom.

Main points to cover:

- Short review of Day 1.
- Connection between inclusive education, VR and game-based learning.
- Presentation of Day 2 objectives.
- Explanation of the activity design task.
- Clarification of the expected output of the day.

Suggested activities:

- Group recap of the main ideas from Day 1.
- Review of participants' reflection templates.
- Short discussion on how student needs can guide activity design.
- Presentation of the Day 2 agenda.

Materials:

- Day 1 reflection templates.
- Training agenda.
- Projector or screen.
- Flipchart, sticky notes or digital board.

Expected result: Participants understand how the work completed on Day 1 will be used as the starting point for the game-based learning and lesson design activities.

Module 3: Game-Based Learning for Special Education

Estimated duration: 4 hours

This part of the day focuses on digital game-based learning and its possible use in special education. Participants explore how game elements can support learning, motivation and participation when they are connected to clear pedagogical objectives.

The session introduces basic game elements such as challenges, rules, feedback, rewards, levels, repetition and progression. Trainers guide participants to reflect on how these elements can be useful for students with special educational needs, especially when learning requires practice, structure, motivation and immediate feedback.

The focus should remain practical. Participants should not only learn what game-based learning is, but also identify how game elements can be used to support specific learning objectives and students.

Materials:

- Module 3 PowerPoint presentation.
- Examples of digital or educational games.
- Game element cards or worksheet.
- Case study cards or learner profiles.
- Whiteboard, flipchart or digital board.

Expected result: Participants understand the basic principles of game-based learning and identify which game elements can support motivation, participation and learning in special education.

Module 4: Designing VR Learning Activities

Estimated duration: 3 hours

This part of the day introduces participants to the design of VR-supported or digital game-based learning activities. The aim is to help teachers organise an activity in a clear and realistic way, taking into account learning objectives, student needs, classroom conditions and the available project materials.

Participants are not expected to design new VR scenarios from scratch. Instead, they work on how to use or adapt the available unBLOCKed learning areas, scenarios, examples or digital resources in their own classroom context. The focus is on pedagogical planning: what the student will learn, how the activity will be introduced, what support will be provided, how the teacher will supervise the activity and how learning will be followed up afterwards.

Materials:

- Module 4 PowerPoint presentation.
- Lesson/activity planning template.
- unBLOCKed learning areas overview.
- Scenario overview, prototype or demo materials, if available.
- Day 1 reflection templates.
- Laptops or tablets, if needed.
- Whiteboard, flipchart or digital board.

Expected result: Participants prepare a first draft of a VR-supported or digital game-based learning activity connected to a student need, a learning objective and the available unBLOCKed project materials.

Day 2 Closing reflection

Estimated duration: 30 minutes

The day ends with a short reflection and review of the first activity drafts. Participants identify what is already clear in their activity plan and what still needs to be improved before the final presentation on Day 3.

Trainers explain that Day 3 will focus on classroom implementation, safety, assessment and final presentations. Participants are encouraged to keep their draft activity plan and use it as the basis for the work planned for the following day.

Suggested reflection questions:

- What learning objective does my activity address?
- Which student need or classroom barrier is connected to this activity?
- What support or adaptation measures have I included?
- What do I still need to clarify before implementing this activity?
- What feedback would be useful before the final presentation?

Final output of Day 2: By the end of Day 2, each participant has prepared a first draft of a VR-supported or digital game-based learning activity. This draft will be reviewed and completed during Day 3, when participants will focus on classroom implementation, safety, assessment and final presentations.

DAY 3: EXECUTION

The third day of the training focuses on how to implement VR and digital game-based learning activities in real classroom contexts. It builds on the activity draft prepared during Day 2 and helps participants complete it by adding classroom organisation, safety measures, student support, observation methods and assessment strategies.

Day 3 includes Module 5 “Classroom Implementation and Safety” and Module 6 “Assessment and Reflection”. The day also includes the final presentations, where participants share the activity plan they have developed during the training and receive feedback from trainers and peers.

The main purpose of the day is to ensure that participants are not only able to plan a VR-supported or digital game-based activity, but also to think about how it can be implemented safely, monitored effectively and evaluated in relation to student participation and learning.

By the end of the day, participants should have a completed classroom use plan for a VR-supported or digital game-based learning activity.

Day 3 schedule

Time	Training block	Main purpose
8:30–9:00	Recap of Day 2 and introduction to Day 3	Review the activity drafts prepared on Day 2 and explain the implementation, safety and assessment focus of Day 3
09:00–10:30	Module 5: Classroom Implementation and Safety — Part 1	Present basic classroom organisation strategies for using VR or digital game-based activities with students
10:30–10:45	Coffee break	
10:45–12:45	Module 5: Classroom Implementation and Safety — Part 2	Identify safety measures, supervision needs, accessibility adaptations and classroom management procedures
12:45–14:00	Lunch break	
14:00–15:15	Module 6: Assessment and Reflection — Part 1	Present simple methods for observing participation, task completion, student support needs and learning progress

15:15–15:30	Coffee break	
15:30–16:15	Module 6: Assessment and Reflection — Part 2	Complete the assessment and reflection section of the activity plan
16:15–17:15	Final presentations and peer feedback	Participants present their classroom use plans and receive feedback from trainers and peers
17:15–17:30	Closing and training evaluation	Complete the final reflection and collect participant feedback on the training

Recap of Day 2 and Introduction to Day 3

Estimated duration: 30 minutes

The day starts with a short recap of the work completed during Day 2. Participants review the first draft of the VR-supported or digital game-based activity they prepared during the lesson design workshop.

Trainers explain that Day 3 will focus on the practical conditions needed to implement the activity in the classroom. This includes classroom organisation, safety, accessibility, supervision, student support, assessment and reflection.

Main points to cover:

- Short review of Day 2.
- Review of the activity drafts prepared by participants.
- Presentation of Day 3 objectives.
- Explanation of the final participant output.
- Introduction to the final presentation format.

Suggested activities:

- Group recap of the main ideas from Day 2
- Review of participants' draft activity plans.
- Identification of what each activity still needs: safety measures, support measures, assessment or follow-up.

- Presentation of the Day 3 agenda.

Materials:

- Draft activity plans from Day 2.
- Training agenda.
- Projector or screen.
- Flipchart, sticky notes or digital board.

Expected result: Participants understand how the activity draft prepared on Day 2 will be completed during Day 3.

Module 5: Classroom Implementation and Safety

Estimated duration: 3.5-4 hours

This part of the day focuses on the practical implementation of VR and digital game-based activities in classroom settings. Participants reflect on what needs to be prepared before using VR with students, how the classroom should be organised and what safety measures should be considered.

The session should help teachers think about realistic classroom conditions. This includes the number of students, available devices, teacher supervision, time limits, seating arrangements, sensory comfort, breaks, cleaning of shared equipment and alternative activities for students who cannot or do not want to use VR.

Trainers should also guide participants to consider the teacher's role before, during and after the activity. Teachers need to prepare students, explain the task clearly, monitor the experience, support students during the activity and organise a follow-up activity afterwards.

Materials:

- Module 5 PowerPoint presentation
- Classroom implementation checklist.
- Safety and supervision checklist.
- Draft activity plans from Day 2.

- VR headsets and controllers, if available.
- Laptops or tablets
- Cleaning materials for shared devices.
- Flipchart or digital board.

Expected result: Participants complete the implementation and safety section of their classroom use plan, including classroom organisation, teacher role, student support and basic safety measures.

Module 6: Assessment and Reflection

Estimated duration: 2-2.5 hours

This part of the day focuses on how teachers can observe, assess and reflect on VR-supported or digital game-based activities. The aim is to provide simple and practical tools that can be used in classroom contexts without making the process too complex.

Participants explore how to observe student participation, task completion, attention, interaction, need for support, emotional response and progress during the activity. Trainers also explain that assessment should not only focus on whether the student completes the task, but also on how the student participates, communicates, follows instructions, responds to feedback and transfers learning to other contexts.

Materials:

- Module 6 PowerPoint presentation.
- Observation checklist.
- Reflection template.
- Draft activity plans from Day 2.
- Pens, paper or laptops/tablets.

Expected result: Participants complete the assessment and reflection section of their classroom use plan.

Final Presentations and Peer Feedback

Estimated duration: 1 hour

In this final practical block, participants present the classroom use plan they have developed during the training. The presentation should be short and focused on the main elements of the activity.

After each presentation, trainers and peers provide constructive feedback. The aim is not to evaluate participants formally, but to help them improve the activity and make it more realistic, inclusive and safe.

Materials:

- Completed activity plans.
- Projector or screen.
- Feedback template.
- Pens, paper or laptops/tablets.

Expected result: Participants present their completed classroom use plan and receive feedback for improvement.

Closing and Training Evaluation

Estimated duration: 15–30 minutes

The training ends with a short closing session. Participants complete a final reflection and provide feedback on the training. Trainers summarise the main outcomes of the three days and explain how participants can use the Practical Teacher Training Guide and the project materials after the training.

Materials:

- Training evaluation form.
- Final reflection template.
- Certificates of participation.

Final output of Day 3: By the end of Day 3, each participant has completed a classroom use plan for a VR-supported or digital game-based learning activity. This final output shows that participants can connect inclusive pedagogy, VR or digital game-based learning, classroom implementation and assessment in a practical and realistic way.

6. Materials Needed

The following materials are recommended for the implementation of the unBLOCKed teacher training.

The materials may be adapted depending on the training format, the number of participants, the availability of VR equipment and whether the unBLOCKed game, prototype or demo version is already available at the time of the training.

6.1. Technological Equipment

The training requires basic digital equipment to present the contents, demonstrate the use of VR and support the practical activities developed by participants.

Recommended equipment:

- **VR headsets and controllers**: These are the main devices used to access the virtual environment. The headset allows the user to see the VR activity, while the controllers allow them to interact with the elements of the game or simulation. They are necessary for the practical parts of the training, where participants explore how students will experience VR-based learning.
- **Laptops or tablets:**for trainers and participants to access presentations, digital materials, templates, online resources and training activities. They are also useful for group work, completing reflection tasks and preparing the classroom use plan during the training.
- **Projector or large screen, with HDMI cables, adapters and extension cords:**for trainers to present slides, examples, videos or digital resources to the whole group.

- **Internet connection:** A stable internet connection is needed to access online materials, shared folders, digital tools, VR applications or cloud-based resources. It also allows trainers to use collaborative tools or online forms during the training.

6.2. Digital Resources

Digital resources should be prepared and tested before the training starts. Trainers should check that all files, links and applications are accessible and that the equipment works properly.

Recommended digital resources:

- **unBLOCKed VR game:** This is the main digital resource of the training. Depending on its availability, trainers can use the full game, a prototype, a demo version or an overview of the scenarios to show how the project learning areas are translated into VR-based activities.
- **Overview of the unBLOCKed learning areas:** This document helps participants understand the main skills addressed by the project, such as personal autonomy, daily life skills, social adaptation and social participation. It is useful for connecting the training activities with the objectives of the project.
- **Presentation slides for each training module:** These slides support the trainer during the explanation of the main contents of each module and help participants follow the structure of the training.
- **Digital copies of templates and handouts:** These allow participants to complete activities, reflection tasks and planning exercises on their own devices or through a shared digital folder.
- **Shared digital folder for training materials:** This folder gives participants easy access to presentations, templates, guides and other training documents before, during or after the sessions.
- **Digital evaluation forms or questionnaires:** These are used to collect participants' feedback on the training and to support the evaluation process.

6.3. Training and Pedagogical Materials

These materials support the training sessions and help participants complete the practical tasks planned during the three days.

Recommended training materials:

- **Practical Teacher Training Guide:** This is the main reference document for the training. It includes the structure, modules, activities and guidance needed to support teachers in using VR and digital game-based learning.
- **Training agenda:** This document shows the timing, sessions and organisation of each training day. It helps both trainers and participants follow the programme.
- **Attendance sheets and participant list:** These are needed to register participation and keep a record of the teachers and professionals attending the training.
- **Name tags:** These are useful when participants do not know each other, especially during group work and peer feedback activities.
- **Module presentations:** These support the delivery of each module and help trainers explain the main ideas in a clear and structured way.
- **Templates and activity documents:**different templates and documents needed to carry out the different activities.
- **Training evaluation form:** This is used to collect participants' feedback at the end of the training.
- **Certificates of participation:** These can be given to participants after completing the training.

6.4. Assessment and Reflection Materials

Assessment and reflection materials are needed to help participants connect the training content with their own teaching practice and prepare their final classroom use plan.

Recommended assessment and reflection materials:

- **Day 1 reflection template**: This helps participants identify one student need or classroom barrier and connect it with the possible use of digital tools or VR.

- **Day 2 activity draft template**: This supports participants while they prepare the first version of their VR-supported or digital game-based learning activity.
- **Peer feedback template**: This helps participants give clear and constructive feedback to each other during the final presentations.
- **Teacher self-reflection template**: This allows teachers to reflect on what worked well, what was difficult and what should be improved after using the activity.
- **Training evaluation questionnaire**: This is used to collect participants' opinions about the training structure, contents, materials and usefulness.
- **Notes or feedback sheets for trainers**: These help trainers record observations, participant questions and possible improvements for future training sessions.

These materials help participants document their learning process and support the transition from training to classroom implementation.

6.5 Classroom Setup and Safety Materials

The physical space should be prepared before the training starts, especially for sessions involving VR equipment. The room should allow participants to move safely and observe VR demonstrations without obstacles.

Recommended setup and safety materials:

- **Clear space for VR demonstration:** This area is needed to use VR safely and avoid obstacles during demonstrations or hands-on practice.
- **Separate area for observers:** This allows other participants to watch the VR activity, take notes and reflect on the learner experience without interrupting the user.
- **Trainer monitoring area:** This helps trainers supervise the activity, guide the person using VR and respond quickly if support is needed.
- **Cleaning wipes or hygiene covers for shared VR headsets:** These are necessary to keep the equipment clean when several people use the same devices.
- **Storage boxes or bags for VR equipment:** These help keep headsets, controllers, cables and accessories organised and protected.

- **Cable management materials:** These help prevent accidents caused by loose cables during demonstrations or group work.
- **First aid kit, according to the hosting organisation's procedures:** This should be available as part of the general safety arrangements of the training venue.
- **Safety instructions for VR use:** These remind participants of basic rules before using VR, such as using the equipment seated when needed, taking breaks and informing the trainer if they feel discomfort.

The training room should be organised in a way that allows trainers to supervise participants easily during VR demonstrations and hands-on activities.

6.6 Accessibility and Inclusion Considerations

Accessibility should be considered in all training materials. Trainers should make sure that presentations, handouts, templates, digital resources and practical activities are clear, easy to follow and adaptable to different needs.

Materials should use simple and direct language, clear instructions and a readable layout. When possible, written information should be supported with visual elements such as icons, pictograms, examples or step-by-step guidance. This is especially useful when explaining classroom procedures, VR safety rules or activity instructions.

Trainers should also prepare alternative ways to participate in the activities. For example, if a participant or student cannot use VR, feels uncomfortable with the headset or needs additional support, the same learning objective can be addressed through observation, discussion, screenshots, videos, printed materials or a non-VR version of the task.

The physical space should also support inclusion. Chairs should be available for seated VR use, and a quiet or break area should be prepared for participants who may need a short pause. Group work should be organised in a way that encourages peer support and allows participants to contribute according to their experience and confidence with digital tools.

In general, all materials and activities should be prepared with flexibility in mind, so that trainers can adapt them to different cognitive, sensory, motor, communication or attention-related needs.

6.7. Trainer Preparation Checklist

Before the training begins, trainers should check that all materials and equipment are ready to use.This preparation helps the training run smoothly and allows participants to focus on how VR and digital game-based learning can be used in their teaching practice.

Preparation check list	Done
The agenda is finalised and has been shared with participants.	☐
All module presentations are prepared, reviewed and tested.	☐
Attendance sheets are printed or available digitally.	☐
Templates, handouts and activity documents are printed or uploaded to the shared digital folder.	☐
The shared digital folder is organised and accessible to participants.	☐
VR headsets and controllers are charged, working and ready to use.	☐
Laptops and tablets are charged and have access to the required materials.	☐
The internet connection has been tested and is stable.	☐
The projector, screen and display settings have been tested.	☐
HDMI cables, adapters, chargers and extensioncords are available.	☐
The unBLOCKed game has been tested.	☐
Online forms, questionnaires or collaborative tools are ready, if used.	☐
Basic safety instructions for VR use are prepared and available.	☐
Cleaning wipes or hygiene covers for shared VR headsets are available.	☐
The room is prepared for presentations, group work and VR demonstrations.	☐
A clear and safe space is available for VR practice and a separate space is prepared for participants observing the VR activity.	☐
Materials are clear, easy to follow and adaptable to different needs.	☐
Non-VR or observation-based alternatives are prepared, if needed.	☐
Training evaluation forms or questionnaires are ready.	☐
Certificates of participation are prepared	☐

7. Expected Outcomes

7.1 General Framework

By the end of this training, teachers are expected to be able to use virtual reality and digital game-based learning applications in special education settings in a safe, inclusive, and purposeful way. Upon completion of the training, the goal is not only for teachers to become familiar with digital tools, but also to use them effectively in lesson planning, classroom implementation, adaptation, and assessment.

Throughout this process, teachers are expected to develop an understanding of inclusive digital pedagogy, become familiar with VR-based learning experiences, grasp the principles of game-based learning, design learning activities, ensure safe implementation, and assess student learning. In this way, technology takes its place in the classroom not merely as an attention-grabbing tool, but as a functional support that strengthens teaching and learning.

7.2 Expected Outcomes

1. Ability to use VR tools and basic digital learning applications in a safe and purposeful way.

By the end of the training, teachers will be able to use VR hardware, the basic functions of VR software, and interactive learning environments for pedagogical purposes. During implementation, they will be able to make appropriate choices according to students' age, attention span, and learning needs, and use technology in a controlled way by linking it to lesson objectives.

2. Ability to integrate VR and digital game-based learning activities into lesson plans.

Teachers will be able to plan digital activities not as additional supportive elements added to the lesson, but as learning components directly connected to the teaching process. By establishing a coherent relationship between learning objectives, activity flow, student interaction, and assessment, they will be able to design more meaningful and structured learning experiences.

3.Ability to adapt digital activities to students' special educational needs.

Teachers will be able to modify the activities they design according to students' cognitive level, attention span, sensory sensitivities, motor skills, and functional learning profiles. When necessary, they will be able to simplify instructions, reduce options, increase the level of support, and make the activity more accessible.

4. Ability to implement VR activities in the classroom in a safe, structured, and well-monitored way.

Teachers will be able to plan session length, closely monitor students, provide seated use when necessary, and schedule sensory regulation breaks. By managing implementation elements such as screen mirroring, brief verbal guidance, and a controlled task flow, they will be able to support both student safety and participation.

5. Ability to observe and assess students' digital learning processes.

Teachers will be able to monitor students' level of participation, task completion, ability to recover after errors, and progress in learning outcomes through observation, digital tracking, and practice-based assessment tools. Based on these observations, they will be able to adjust the teaching process and plan future implementations more effectively.

6. Ability to reflect on and evaluate their own teaching practices.

After implementation, teachers will be able to identify what worked well, what challenges emerged, and what improvements are needed for future practice. In this way, they will adopt a reflective approach that improves not only student performance but also their own teaching practice.

7. Ability to transform the principles of inclusive digital pedagogy into classroom practice.

By considering accessibility, participation, adaptation, safety, assessment, and transfer to real life together, teachers will be able to create more supportive and functional learning environments. In this way, technology becomes a meaningful, sustainable, and practical teaching support for students in special education.

7.3 Practical Outcomes in Classroom Use

By the end of the training, teachers are expected to be able to prepare at least one VR-based lesson plan, adapt at least one digital game-based activity to students' needs, and monitor these practices through basic observation and assessment tools.

In this process, the aim is not only for teachers to implement digital activities, but also to become professionals who connect each activity to learning objectives, adapt it to students' individual characteristics, ensure safety and participation during implementation, and evaluate the outcomes achieved.

Accordingly, teachers are expected to be able to select appropriate objectives and content before implementation, monitor students' attention, participation, and task completion during implementation, and interpret students' progress after implementation through brief and functional assessment tools.

In this way, the training goes beyond raising awareness and becomes a field of professional competence that teachers can directly use, apply, and further develop in their classrooms.

7.4 Conclusion

The main purpose of this section is to clearly and comprehensively define what teachers will be able to do by the end of the training. The expected outcomes cover the dimensions of planning, implementation, adaptation, observation, assessment, and improvement together.

Through this approach, the teacher moves beyond simply being someone who is familiar with virtual reality and digital game-based learning; instead, they become someone who can select these tools according to their students' needs, use them safely, monitor learning, and continuously improve their own practice.

8. Evaluation of the Training

8.1 Introduction

Evaluation is an integral part of every successful teacher training programme. It is not merely the process of assigning scores or collecting feedback forms; rather, it is a continuous and

systematic process that examines whether the training has achieved its intended objectives and identifies opportunities for further improvement.

Within the **unBLOCKed** project, evaluation serves multiple purposes. Firstly, it ensures that participating teachers develop the competencies necessary to integrate Virtual Reality (VR) and digital game-based learning into special education. Secondly, it provides evidence that the training programme meets the quality standards expected within Erasmus+ cooperation projects. Finally, evaluation findings contribute directly to improving future versions of the curriculum, teacher guide, digital game, and VR learning activities through the project's pilot implementation and quality assurance processes.

Unlike traditional assessment, which often focuses only on testing knowledge, the evaluation framework in this programme adopts a holistic approach. It considers teachers' knowledge, practical skills, confidence, attitudes towards technology, classroom implementation, and professional reflection. This comprehensive approach recognises that successful integration of innovative technologies requires more than technical competence; it requires pedagogical understanding, adaptability, and reflective practice.

8.2 Objectives of the Evaluation

The evaluation process has several interconnected objectives:

- To determine whether the learning objectives of each training module have been achieved.
- To measure teachers' progress in developing digital and pedagogical competencies.
- To assess participants' confidence in using VR technologies and game-based learning.
- To evaluate the quality, relevance, and accessibility of the training materials.
- To identify strengths and weaknesses of the training programme.
- To gather recommendations for improving future training sessions.
- To monitor the practical application of acquired knowledge in real classroom environments.

- To generate evidence supporting the project's dissemination and sustainability activities.

Ultimately, evaluation should help ensure that teachers leave the programme not only with theoretical knowledge but also with practical skills that positively affect students with special educational needs.

8.3 Principles of Effective Evaluation

Evaluation throughout the unBLOCKed Teacher Training Programme should follow several fundamental principles.

Continuous

Evaluation should occur throughout the entire training rather than only at its conclusion. Continuous monitoring allows trainers to identify misunderstandings early and provide timely support.

Inclusive

The evaluation process itself should reflect inclusive educational values. Teachers participating in the programme have diverse backgrounds, digital competencies, and professional experiences. Therefore, evaluation methods should accommodate these differences and provide multiple opportunities to demonstrate learning.

Evidence-Based

All evaluation conclusions should rely on observable evidence rather than assumptions. Evidence may include lesson plans, classroom observations, portfolios, participant reflections, digital products, and implementation reports.

Constructive

Evaluation should promote professional growth rather than judge participants. Feedback should encourage experimentation, innovation, and continuous improvement.

Practical

Since the purpose of the training is classroom implementation, evaluation should emphasise authentic teaching practice rather than purely theoretical knowledge.

8.4 Evaluation Timeline

Evaluation should be integrated into every stage of the training programme.

Training Stage	Evaluation Purpose	Evaluation Tool
Before training	Determine baseline knowledge and expectations	Pre-training survey
During each module	Monitor understanding and participation	Observation, quizzes, discussions
After each module	Measure immediate learning	Reflection journals
End of training	Assess overall competence	Portfolio, lesson presentation, questionnaire
Pilot classroom implementation	Evaluate transfer of learning	Classroom observation, teacher reflection
Final project evaluation	Improve curriculum	Comparative analysis of collected data

This cyclical approach ensures that evaluation informs every stage of the learning process rather than functioning solely as a final checkpoint.

8.5 Levels of Evaluation

The training programme uses a four-level evaluation model adapted from internationally recognised professional development evaluation frameworks.

Level 1 – Participant Satisfaction

The first level measures participants' immediate reactions to the training experience.

Positive participant satisfaction does not necessarily indicate effective learning, but it provides valuable information regarding the quality of organisation, facilitation, materials, and learning environment.

Areas to evaluate include:

- Relevance of training content
- Quality of presentations
- Practical usefulness
- Trainer expertise
- Opportunities for interaction
- Quality of digital resources
- Accessibility of materials
- Overall satisfaction

Sample Statements

Participants indicate their agreement using a five-point Likert scale.

- The objectives of today's session were clear.
- The activities were relevant to my professional practice.
- The trainer encouraged participation.
- I feel motivated to apply what I learned.
- The pace of the training was appropriate.
- The VR activities were engaging.

- The digital game examples reflected authentic classroom situations.
- The training environment supported collaborative learning.

Open-ended questions may include:

- Which activity was the most valuable?
- Which activity should be improved?
- What additional topics would you like included?
- What challenges did you experience?

8.6 Evaluation of Knowledge Acquisition

Knowledge evaluation determines whether teachers have developed a sufficient theoretical understanding of:

- Inclusive education
- Universal Design for Learning
- Digital pedagogy
- Virtual Reality technologies
- Educational game mechanics
- Accessibility principles
- Digital assessment
- Classroom safety

Rather than relying exclusively on written examinations, multiple assessment approaches should be used.

Knowledge Assessment Activities

Examples include:

- Interactive quizzes
- Group discussions
- Case study analysis

- Scenario-based decision making
- Concept mapping
- Peer teaching
- Problem-solving exercises

For example, participants may analyse a classroom scenario involving a learner with autism and design an appropriate VR-supported intervention using principles discussed during the training.

8.7 Evaluation of Practical Skills

Practical competence represents one of the most important dimensions of the programme.

Teachers should demonstrate that they can:

- Set up VR equipment safely.
- Operate educational software.
- Troubleshoot common technical problems.
- Facilitate immersive learning experiences.
- Manage student behaviour during VR sessions.
- Adapt activities for different disabilities.
- Integrate digital games into lesson plans.

During workshops, trainers use structured observation forms.

Sample Observation Criteria

Competency	Indicators
Technical Skills	Operates headset correctly; launches applications independently
Pedagogical Design	Activity aligns with curriculum objectives
Inclusion	Appropriate adaptations for learners with SEN
Classroom Management	Clear instructions; effective monitoring
Assessment	Uses formative assessment during activity

Reflection	Evaluates own teaching critically

Each criterion may be rated on a four-point scale:

1. Beginning
2. Developing
3. Proficient
4. Advanced

8.8 Portfolio Assessment

Throughout the training, teachers develop a professional portfolio demonstrating their learning journey.

The portfolio encourages continuous reflection while providing concrete evidence of competency development.

A complete portfolio should include:

- Personal learning goals
- Completed worksheets
- Lesson plans
- Adapted activities
- Screenshots of VR activities
- Digital game designs
- Student assessment tools
- Reflection journals
- Peer feedback
- Classroom implementation report

Rather than grading the portfolio numerically, trainers should assess its completeness, quality, creativity, and practical applicability.

8.9 Peer Evaluation

Collaborative learning is one of the core principles of professional development.

Teachers often learn effectively from observing colleagues.

Following lesson design workshops, participants exchange lesson plans and provide constructive feedback using agreed criteria.

Peer reviewers may comment on:

- Learning objectives
- Accessibility
- Student engagement
- Use of VR
- Game mechanics
- Assessment strategies

Peer evaluation promotes professional dialogue while exposing teachers to diverse teaching approaches.

8.10 Self-Reflection

Reflective practitioners continually evaluate and improve their own teaching.

For this reason, participants should complete reflection journals after each module.

Reflection Questions

- What new knowledge did I gain today?
- Which activity challenged me the most?
- What surprised me?
- Which ideas can I immediately use in my classroom?
- What additional support do I need?

- How will today's learning improve outcomes for my students?

Reflection encourages teachers to connect theory with classroom practice.

8.11 Pilot Classroom Evaluation

One of the most significant stages of the unBLOCKed project is the pilot implementation of developed learning materials in authentic educational settings.

Teachers implement at least one VR-supported lesson with their own students.

Evidence collected during the pilot may include:

- Observation notes
- Student participation records
- Lesson plans
- Student work
- Teacher reflections
- Short student feedback forms (where appropriate)
- Photographs or videos (subject to ethical approval and school policies)

Pilot implementation allows project partners to determine whether the developed materials are practical, accessible, and adaptable across different educational contexts.

8.12 Indicators of Success

Evaluation data should demonstrate measurable progress across several dimensions.

Examples include:

Teacher Competence

- Increased confidence using VR.
- Improved digital literacy.
- Better understanding of inclusive pedagogy.

- Successful integration of game-based learning.

Training Quality

- High participant satisfaction.
- Positive trainer evaluations.
- Completion of all modules.
- Strong engagement during workshops.

Classroom Impact

- Successful pilot implementation.
- Increased student motivation.
- Improved classroom participation.
- Greater accessibility for learners with disabilities.

Project Quality

- Achievement of planned learning outcomes.
- Positive partner feedback.
- Usability of developed materials.
- Evidence supporting dissemination and sustainability.

8.13 Ethical Considerations

Evaluation should always respect professional ethics.

Teachers should be informed:

- why evaluation data are collected;
- how data will be used;
- who will access the results;
- that participation in feedback activities is voluntary where appropriate;
- that confidentiality will be maintained.

When collecting classroom evidence involving students with disabilities, schools must comply with national regulations regarding informed consent, privacy, and data protection.

8.14 Using Evaluation Results for Continuous Improvement

Evaluation should conclude with action rather than simply reporting results.

Project partners should analyse the collected evidence to identify:

- strengths of the curriculum;
- modules requiring revision;
- accessibility improvements;
- additional teacher support needs;
- technical issues affecting VR implementation;
- opportunities for expanding the programme to new educational contexts.

Findings should feed directly into the refinement of the **Teacher Training Curriculum**, the **Practical Teacher's Guide**, the **unBLOCKed digital game**, and future dissemination activities, ensuring that the project's outputs remain sustainable and responsive to teachers' needs.

8.15 Final Reflection and Professional Action Plan

The final evaluation activity encourages participants to synthesise their learning and plan for future implementation.

Each teacher prepares a **Personal Professional Action Plan**, outlining:

- Three practices they will implement immediately.
- One VR lesson they intend to deliver within the next month.
- Resources they still require.
- Potential challenges and proposed solutions.
- Opportunities to share their learning with colleagues.

This final activity reinforces the idea that professional development is an ongoing process. By setting realistic goals and reflecting on their experiences, teachers become active agents in the continued development of inclusive, technology-enhanced education for learners with special educational needs.

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