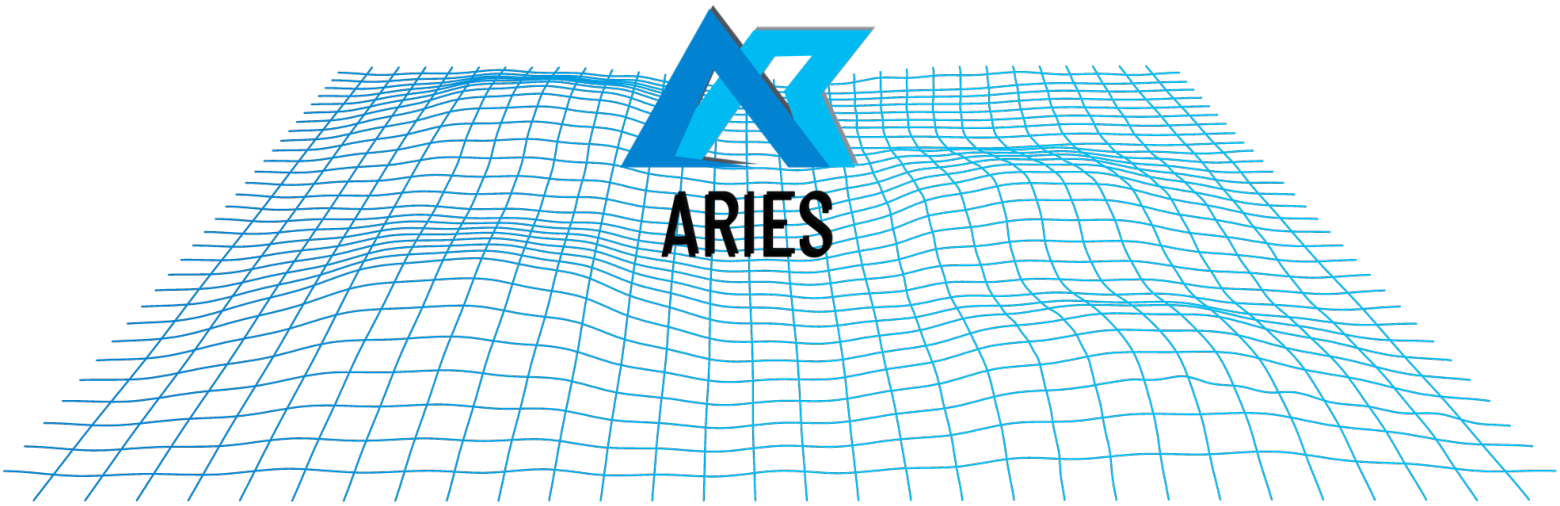

a Competence Framework Abstract

"ARIES Competence Framework in Focus"

A condensed guide for educators to integrate innovative teaching methods using AR/IR technologies and key competences.

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Introduction to the ARIES Competence Framework

The ARIES Competence Framework has been developed to support teachers in integrating Augmented Reality (AR) and Immersive Reality (IR) technologies into their teaching. With the increasing use of AR/IR in education, there are new opportunities to increase student engagement, create interactive learning environments and develop key skills for the modern world.

This framework provides teachers with practical tools for the theoretical underpinnings of incorporating AR/IR technologies into their teaching strategies, focusing on three key areas Planning, delivering and assessing lessons that incorporate these technologies. By following the ARIES framework, teachers can create dynamic, student-centred learning experiences that promote critical thinking, creativity and digital literacy.

The ARIES framework is aligned with the European Qualifications Framework (EQF), ensuring that the competences developed are recognised across Europe. This allows both teachers and students to benefit from transferable, well-structured learning outcomes that prepare them for future challenges.

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Aims and Structure of the ARIES Competence Framework

The ARIES Competence Framework aims to provide a structured, practical approach to integrating Augmented Reality (AR) and Immersive Reality (IR) into everyday teaching. It focuses on equipping teachers with the necessary tools and skills to make learning more interactive and engaging, while supporting the development of key competences in students.

The framework is divided into four main clusters: social, personal, organisational and subject (core) competences. These clusters cover both general skills that are important for any educator and the specific knowledge required to use AR/IR technologies effectively in the classroom.

The structure is designed to support teachers in three core phases

- Planning: developing clear learning pathways that integrate AR/IR tools into existing curriculum objectives.
- Implement: Implementing AR/IR-based lessons that actively engage students and enhance traditional teaching methods.
- Assess[1]: Teachers who are already familiar with different assessment strategies can apply them naturally to AR/IR-based lessons.

Each section of the ARIES Competence Framework is structured to help teachers at different levels of experience with AR/IR, from beginners to advanced. By offering multiple entry points, the framework ensures that all educators can find resources and guidance relevant to their current needs and abilities.

[1] This chapter is only found in the full version of the ARIES framework

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Theoretical Foundations: LEVEL5 and EQF

The ARIES Competence Framework is grounded in two key theoretical models: the **LEVEL5 approach** and the **European Qualifications Framework (EQF)**. These models provide a structured way to define and assess the development of competences, ensuring that the framework is both practical and aligned with broader European educational standards.

LEVEL5 Approach

The LEVEL5 approach was developed to simplify and operationalize the development of competences. It recognizes that competences are a blend of knowledge, skills, and attitudes, which are critical to performing real-world tasks effectively. In the ARIES framework, LEVEL5 helps to break down each competence into measurable and actionable components that teachers can use to guide their professional growth.

LEVEL5 organizes competences into different levels of mastery:

- **Knowledge:** What a person knows and understands.
- **Skills:** What a person can do and apply.
- **Attitudes:** How a person approaches tasks with emotions, values, and motivations.

By focusing on these three dimensions, teachers are encouraged to continuously develop their capacity to implement AR/IR technologies in the classroom.

European Qualifications Framework (EQF)

The EQF serves as a common European reference framework that facilitates the comparison of qualifications across different countries and educational systems. It consists of eight levels, each describing the expected learning outcomes in terms of knowledge, skills, and competences.

By aligning the ARIES Competence Framework with the EQF, the competences developed through this framework are transferable and recognized throughout Europe. This ensures that both teachers and students are developing skills that are relevant and comparable across a variety of educational contexts.

In practical terms, this means that the competences developed through the ARIES project are designed to meet recognized standards of professional development. Teachers can trust that the skills they acquire will be applicable not only within their own classrooms but also in broader educational environments across Europe.

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The Four Competence Clusters

The ARIES Competence Framework is organized into four key competence clusters: **social**, **personal**, **organizational**, and **field-specific** competences. These clusters cover a comprehensive range of skills and abilities that teachers need to effectively integrate Augmented Reality (AR) and Immersive Reality (IR) into their classrooms, while also supporting the holistic development of their students.

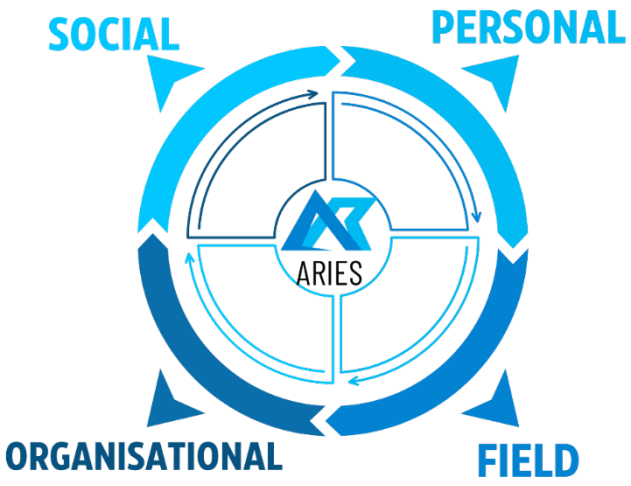

Figure 1: 4 cluster competence setting

1. Social Competences

Social competences help teachers foster a collaborative, communicative, and inclusive classroom environment. These skills ensure that students are not only engaged in the content but also in how they interact with each other and with the teacher.

- **Key focus areas** include communication, teamwork, conflict management, and empathy.
- **Teacher impact:** By enhancing social competences, teachers can create a positive learning atmosphere where students are motivated to share ideas and learn from each other.

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2. Personal Competences

Personal competences focus on self-awareness, emotional resilience, and adaptability. These competences are essential for teachers to manage their own professional growth and deal with the dynamic challenges of the modern classroom.

- **Key focus areas** include problem-solving, creativity, self-awareness, and initiative.
- **Teacher impact:** Developing personal competences allows teachers to reflect on their own teaching practices and continuously improve, which in turn supports the personal growth of their students.

3. Organizational Competences

Organizational competences help teachers manage their classrooms efficiently, plan lessons effectively, and deliver content in a structured way. These skills ensure that teaching is well-organized, clear, and adaptable to different learning needs.

- **Key focus areas** include project management, resource planning, and strategic thinking.
- **Teacher impact:** Teachers with strong organizational competences can structure their lessons to maximize engagement and learning, while also managing their workload more effectively.

4. Field-Specific Competences

Field-specific competences focus on the practical knowledge and skills required to implement and facilitate AR/IR technologies in the classroom. This competence area ensures that teachers are equipped to use the latest digital tools to enhance learning experiences.

- **Key focus areas** include understanding AR/IR technologies, integrating them into lessons, and assessing their impact on student learning.
- **Teacher impact:** By mastering field-specific competences, teachers can confidently use AR/IR technologies to create immersive, engaging, and innovative learning environments.

Together, these four clusters provide a holistic framework for teacher development, ensuring that educators are well-prepared to support student learning in a technologically advanced and collaborative classroom environment.

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The ARIES Core Competence: Implementation of AR/IR in the Classroom

At the heart of the ARIES Competence Framework is the core competence: **Implementation and Facilitation of Augmented and Immersive Reality (AR/IR) in the Classroom**. This competence equips teachers with the knowledge, skills, and attitudes necessary to integrate AR/IR technologies into their teaching practices, making learning more dynamic, interactive, and engaging for students.

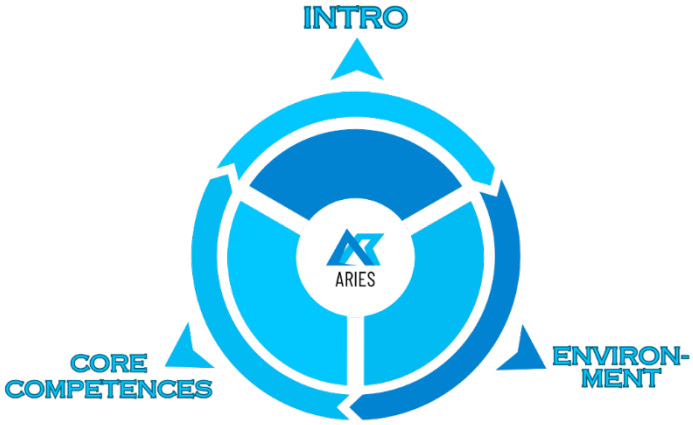

Figure 2: Chapter 1

Core Competence Statement

"A teacher is able to explain and communicate (basically understand), facilitate, integrate, and reflect on augmented and immersive reality. Therefore, they are able to incorporate AR/IR concepts (covering the latest advancements and related methodologies) into their teaching style to enhance the students' learning experience."

Key Aspects of the Core Competence:

1. **Understanding AR/IR Technologies:** Teachers must have a solid grasp of what AR and IR technologies are, how they function, and why they are valuable tools in the educational environment. This includes understanding the potential of these technologies to create immersive learning experiences that cannot be replicated through traditional methods.
2. **Facilitating the Use of AR/IR in the Classroom:** Teachers need to be able to introduce and explain AR/IR concepts to students in a way that encourages exploration and

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engagement. This involves being able to guide students through the use of AR/IR tools, ensuring that the technology enhances their understanding of the subject matter.

3. **Integrating AR/IR into Teaching Methods:** The integration of AR/IR should not disrupt the flow of traditional teaching but rather complement and enrich it. Teachers must be adept at embedding AR/IR technologies into existing lesson plans and curriculum goals, ensuring that these tools serve the broader educational objectives.
4. **Reflection and Adaptation:** Teachers must continuously reflect on their use of AR/IR technologies, assessing what works well and where improvements can be made. This reflective process ensures that AR/IR tools are used effectively and that both teachers and students can adapt to new technologies as they evolve.

Stages of Core Competence Implementation:

1. **Planning:** Teachers develop lesson plans that incorporate AR/IR technologies, focusing on how these tools can be used to enhance specific learning outcomes. This includes mapping out how AR/IR activities align with broader curriculum goals.
2. **Delivering:** In this stage, teachers introduce AR/IR technologies to their students and guide them through interactive lessons. The goal is to make learning more engaging and immersive, encouraging students to explore concepts in new ways.
3. **Assessing:** While not the primary focus of this guide, assessing student progress in AR/IR-enhanced lessons remains crucial. Teachers evaluate both the learning outcomes and the effectiveness of AR/IR tools in achieving these outcomes, making adjustments as needed.

By developing this core competence, teachers will be able to seamlessly integrate AR/IR technologies into their classroom practices, creating a learning environment that fosters creativity, engagement, and deeper understanding of the subject matter.

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Generic Competences Overview

In addition to the core competence of implementing AR/IR technologies in the classroom, the ARIES Competence Framework emphasizes the development of **generic competences**. These competences are essential for both teachers and students, as they contribute to a well-rounded, effective learning environment. The generic competences are grouped into three key areas: **social**, **personal**, and **organizational** competences.

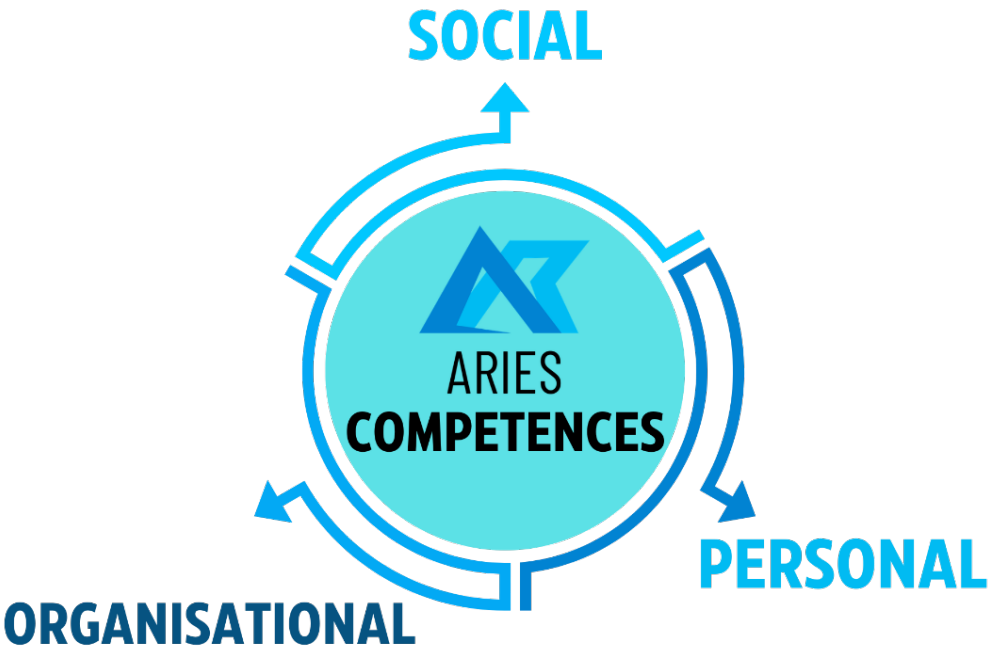

Figure 3: Generic competences

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1. Social Competences

Social competences are vital for fostering a collaborative, communicative, and inclusive classroom environment. They enable teachers to build strong relationships with students and create a learning atmosphere where students feel comfortable sharing ideas, asking questions, and engaging with their peers.

Figure 4: Social competences

- **Key competences include:**
  - Communication: Clear, effective dialogue with students and colleagues.
  - Teamwork: Encouraging collaboration among students to solve problems and complete tasks.
  - Empathy: Understanding students' diverse perspectives and creating a supportive learning space.

Teacher impact: By strengthening social competences, teachers can help students develop their own abilities to work effectively in groups, communicate clearly, and show respect for others' viewpoints.

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2. Personal Competences

Personal competences focus on teachers' self-development, self-awareness, and the ability to adapt to new challenges. These competences are critical for teachers in managing their classroom dynamics, responding to unexpected situations, and continuously improving their teaching methods.

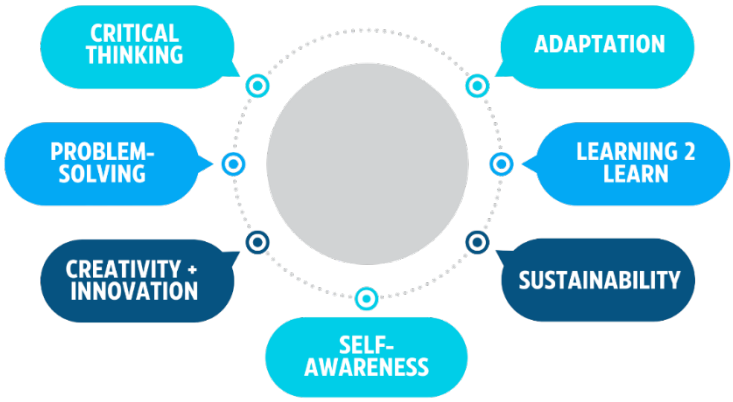

Figure 5: Personal competences

- **Key competences include:**
  - Problem-solving: Finding effective solutions to teaching challenges.
  - Creativity: Designing innovative lessons that engage students with AR/IR.
  - Resilience: Managing stress and maintaining a positive attitude, even in difficult teaching circumstances.

Teacher impact: Developing personal competences enables teachers to grow both professionally and personally, leading to a more flexible and innovative teaching style that can inspire students to take initiative and think creatively.

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3. Organizational Competences

Organizational competences involve managing the classroom efficiently, planning lessons effectively, and ensuring that resources are used wisely. These competences ensure that teachers can implement AR/IR technologies in a structured and systematic way, contributing to a more organized and focused learning environment.

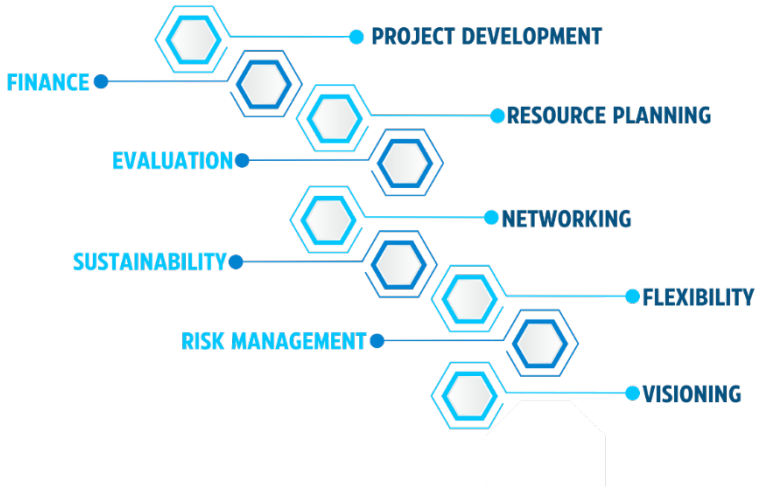

Figure 6: Organisational Competences

- **Key competences include:**
  - Project management: Planning and executing AR/IR lessons in a way that aligns with curriculum objectives.
  - Resource planning: Making the best use of available AR/IR tools, ensuring that students have the resources they need to engage with the lesson.
  - Time management: Structuring lessons to maximize learning time while integrating AR/IR technologies effectively.

Teacher impact: Strong organizational competences help teachers create a smooth, well-managed classroom environment where students can stay focused and engaged. Teachers can also ensure that AR/IR technologies are integrated seamlessly into their lessons without disrupting the flow of the class.

These generic competences are designed to support the broader goal of helping teachers implement AR/IR technologies effectively while enhancing their overall teaching abilities. They provide a foundation that complements the core AR/IR competence, ensuring that both teachers and students are equipped with the skills needed for success in a modern classroom.

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Practical Strategies for Teachers

To help teachers effectively implement the ARIES Competence Framework in their classrooms, this chapter provides a range of **practical strategies** for integrating Augmented Reality (AR) and Immersive Reality (IR) technologies into daily teaching. These strategies are designed to be flexible and adaptable to various subjects and teaching styles, allowing teachers to tailor them to their specific classroom needs.

1. Integrating AR/IR in Different Subjects

One of the strengths of AR/IR technologies is their ability to be integrated into virtually any subject. Here are some examples of how teachers can use these tools to enrich learning experiences in specific subjects:

- **Science:**
  AR can be used to create virtual lab environments where students can conduct safe experiments, explore chemical reactions, or examine the anatomy of living organisms in 3D.
    - *Example:* Using an AR app, students can virtually dissect a frog or explore the solar system in a 3D space, making abstract concepts more tangible.
- **History:**
  IR tools can bring historical events to life by allowing students to "visit" ancient cities or witness historical moments through immersive virtual reality.
    - *Example:* Students can explore the ruins of ancient Rome using IR simulations, gaining a deeper understanding of the cultural and architectural aspects of the civilization.
- **Language Arts:**
  AR can be used to create immersive literary experiences, enabling students to interact with characters or settings from the stories they are studying.
    - *Example:* Students can use AR to visualize key scenes from Shakespeare's plays, deepening their comprehension of the text through interactive exploration.

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2. Engaging Students with Interactive Learning

AR/IR technologies offer an excellent way to boost student engagement by making learning more interactive and fun. Here are some strategies to get students actively involved:

- **Gamified Learning:**

  Use AR/IR to create interactive quizzes, treasure hunts, or puzzles that align with the lesson's content. Gamification keeps students motivated and engaged by introducing an element of competition or fun into the learning process.

  - *Example:* A geography lesson can be turned into an AR-based treasure hunt where students explore different countries virtually, answering questions to unlock new locations.

- **Group Projects and Collaboration:**
  Encourage students to work in groups to create their own AR/IR content. This not only enhances their subject knowledge but also helps them develop teamwork, problem-solving, and creative skills.

  - *Example:* In a history project, students can collaboratively design an AR exhibit on a historical figure, combining research with creativity as they develop virtual artifacts and narrations.

3. Flexible Implementation in Existing Curriculum

Teachers can start small by integrating AR/IR tools into already established lesson plans without overhauling their entire curriculum. Here are some simple ways to begin:

- **Start with Supplemental AR/IR Activities:**
  Introduce AR/IR as a supplemental tool for specific lessons. For example, use AR apps to enhance visual learning in certain topics like geometry or biology, where visualizing shapes or anatomical structures can support understanding.

- **Interactive Homework Assignments:**
  Assign homework that involves AR/IR technology, such as exploring a virtual museum or completing a 3D interactive map. This allows students to continue learning outside the classroom in an engaging and interactive way.

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4. Practical Tips for Teachers New to AR/IR

For teachers who are just beginning to use AR/IR technologies, here are a few practical tips:

- **Start Simple:**

  Begin with easy-to-use AR apps and tools that require minimal setup. As you grow more comfortable with the technology, gradually introduce more complex tools and activities.

- **Test the Technology in Advance:**
  Make sure to familiarize yourself with the AR/IR tools before using them in class. This helps you identify any potential issues and ensures a smooth classroom experience.

- **Involve Students in the Learning Process:**
  Let students explore AR/IR tools on their own as part of the learning process. Many students may already be familiar with these technologies and can offer helpful insights to both peers and teachers.

By applying these practical strategies, teachers can begin to integrate AR/IR technologies into their teaching practices in a manageable, effective way. These strategies not only enhance student engagement but also align with the ARIES Competence Framework's broader goals of developing a dynamic, innovative, and interactive learning environment.

Conclusion and Next Steps

The ARIES Competence Framework is designed to guide teachers in integrating Augmented Reality (AR) and Immersive Reality (IR) technologies into their classrooms, creating a more dynamic, engaging, and student-centred learning environment. By focusing on four key competence areas—social, personal, organizational, and field-specific—this framework ensures that teachers are well-prepared to implement these innovative tools in ways that enhance traditional teaching methods.

Throughout this guide, we have emphasized the importance of planning, delivering, and adapting lessons using AR/IR, with the ultimate goal of making learning more interactive and effective. Teachers can begin small, integrating AR/IR technologies gradually, and expand their usage as they grow more confident in their abilities to manage these tools. By focusing on both teacher and student development, the framework promotes a holistic approach to education that empowers both groups to grow and succeed in the digital age.

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Next Steps for Teachers:

1. **Start with a Core Lesson:**

   Identify one lesson or subject area where AR/IR technology can add value. Begin with a simple activity, such as an AR app that enhances visual learning, and see how your students respond.

2. **Explore Available Tools:**

   Many free or low-cost AR/IR tools are available for teachers to explore. Experiment with different applications to find what works best for your teaching style and subject matter.

3. **Collaborate with Peers**

   Share your experiences and ideas with other teachers. Collaborating with colleagues can help you discover new strategies for integrating AR/IR and provide support as you experiment with these new technologies.

4. **Reflect and Adjust:**

   As you use AR/IR in the classroom, reflect on what works well and where improvements can be made. Continuously refine your approach to maximize the impact on student learning.

Moving Forward with the ARIES Competence Framework:

The ARIES Competence Framework is not static—it's meant to grow and evolve as new technologies emerge and as teachers become more comfortable with integrating AR/IR into their classrooms. We encourage you to continue exploring and experimenting with these tools, and to use the framework as a guide for ongoing professional development. By doing so, you'll not only enhance your own teaching practice but also help your students develop the critical skills they need to succeed in an increasingly digital world.

For more detailed explanations and further examples, please refer to the full ARIES Competence Framework document, where you will find deeper insights into each competence area and comprehensive guidance on how to implement these strategies in your classroom.

With this final chapter, the 15-page guideline is complete, providing a streamlined yet comprehensive overview of the ARIES Competence Framework, tailored to meet the needs of teachers in a practical and accessible way. Let me know if any further adjustments are needed!

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