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Augmented and immersive Reality for Improved Education in Schools in Europe

ARIES

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Interviews on innovative learning approaches through A&IR

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Executive Summary

This report presents findings from the ARIES project, which explores innovative learning approaches through the integration of Augmented and Immersive Reality (A&IR) technologies in European educational settings. The study involved conducting 31 semi-structured interviews with educators and school leaders from Italy, Germany, Romania, Greece, and Lithuania to assess their understanding, implementation, and perception of A&IR in their institutions.

The report highlights both the potential benefits and challenges associated with using A&IR in educational contexts. The educators expressed enthusiasm for the potential of A&IR to increase student engagement, enhance personalized learning, and support inclusivity, particularly for students with special needs. A&IR technologies, such as Augmented Reality (AR) and Virtual Reality (VR), can offer interactive and immersive learning experiences that foster 21st-century skills like critical thinking, creativity, and collaboration.

However, several barriers to the widespread adoption of A&IR were also identified. Key challenges include the high costs of technology, a lack of sufficient training for educators, inadequate technological infrastructure, and resistance from educational institutions. Many teachers reported limited access to funding and the necessary hardware, as well as the need for ongoing professional development to effectively use these technologies.

The report suggests strategies to overcome these challenges, including investing in low-cost, user-friendly A&IR tools, providing targeted training for educators, and fostering institutional support for technology integration. Collaboration among schools, technology developers, and policy-makers is also recommended to create an enabling environment for A&IR in education. Ultimately, A&IR technologies have the potential to transform educational practices by making learning more engaging, accessible, and personalized, though significant systemic changes are needed for their full integration.

The findings of this report aim to inform future educational policies and research initiatives, focusing on scaling A&IR adoption and assessing its long-term impact on learning outcomes.



1. Introduction and methodology

As part of the ARIES project, which seeks to explore innovative learning methods in European educational institutions through the integration of Augmented and Immersive Reality (A&IR) technologies, 31 interviews were conducted with teachers and principals from institutions in five European countries: Italy, Germany, Romania, Greece and Lithuania. These interviews were designed to investigate both the understanding and the implementation of A&IR technologies in educational settings.

The interviews were semi-structured, allowing for a flexible yet consistent approach to gathering insights. Questions were tailored to the interviewees' professional backgrounds and contexts, ensuring that the conversations remained relevant and focused on practical applications of A&IR in their respective institutions.

While face-to-face interviews were preferred, logistical constraints such as distance and time led to the use of telephone and online tools in several cases. Each interview consisted of two main parts: (1) an overview of A&IR, focusing on the participants' knowledge and perceptions of A&IR, and (2) an exploration of the use of A&IR in teaching practices, probing into any concrete initiatives or experiences involving these technologies. Moreover, all interviews began with a brief introduction to the ARIES project and its goals, then the interviewers briefly explained the purpose of the interview.

The study not only highlights the varying degrees of familiarity with A&IR across different educational settings but also delves into the challenges of implementation, such as limited access to resources, lack of training, and cost barriers. Through these interviews, the ARIES project aims to identify potential pathways for integrating A&IR into everyday teaching practices and to develop strategies to enhance teacher competencies in this emerging field.

Below is a set of questions used to conduct the semi-structured interview by each partner.

PART I. Overview of Augmented and Immersive Reality

1. What is for you Augmented and Immersive Reality?
2. Do you know about Augmented and Immersive Reality experiences carried out in your country in school education? If not, in your opinion, which are the main reasons for the lack?
3. In your opinion, how strong is the interest among teachers towards the use of Augmented and Immersive Reality in educational contexts?



4. What do you think it could be done to improve Augmented and Immersive Reality competencies in your country?
5. Do you think that Augmented and Immersive Reality is an important factor to reduce drop-out or improve inclusion? If yes, how?
6. In your opinion, what would be the positive effects of using Augmented and Immersive Reality in a classroom, if any?
7. Do you see any limitations in the implementation of the Augmented and Immersive Reality experiences? (costs, lack of competencies, methodological, technological skills, device maintenance, and so on)

PART II. Augmented and Immersive Reality practices in teaching experiences

1. To what extent do A&IR initiatives affect your daily educational routine?
2. What do you do towards the A&IR development within your lessons?
3. What does your institution do to increase the knowledge about A&IR among teachers/students (e.g. any specific learning initiatives)?
4. Can you share with us some A&IR initiatives that you have successfully implemented/are currently running/planning? Please indicate also the technologies and methodologies used.
5. How often does your institution promote A&IR learning activities for teachers or students?
6. Do you think that easy-to-use, low-threshold, and low-cost tools would facilitate the adoption of A&IR in daily learning activities?
7. In your opinion, what are the most important competencies, skills, and knowledge needed to implement A&IR learning experiences?
8. Which are for you the most important soft skills and competencies* in implementing A&IR learning experiences?

2. Analysis of results

The exploration of A&IR in education presents a rich opportunity for transforming pedagogical practices and improving student outcomes. Based on interviews with teachers and school principals, this report discusses the multiple dimensions of implementing A&IR in educational contexts, examining its potential benefits, existing challenges, and the steps required to



facilitate its successful integration. By addressing the technological, financial, pedagogical, and institutional factors that shape the deployment of A&IR, this analysis provides a comprehensive overview aimed at informing future educational policies and research initiatives.

2.1 Introduction to Augmented and Immersive Reality in Education

A&IR, which includes Augmented Reality (AR) and Virtual Reality (VR), refers to the use of technology to overlay digital information on the physical world (AR) or create fully virtual environments (VR). These technologies are gaining increasing attention in educational settings due to their potential to provide immersive and interactive learning experiences. AR enhances reality by overlaying virtual elements - such as 3D models, images, or animations - on real environments, while VR immerses users in fully virtual worlds that allow them to explore, interact, and participate in experiences otherwise unavailable in physical classrooms. Mixed Reality (MR) further merges the real and virtual by allowing users to interact with both environments simultaneously.

The implications of A&IR for education are vast. These technologies offer opportunities for experiential learning, collaborative engagement, and the customization of educational content to meet individual learning needs. However, as revealed through interviews with educators, the integration of A&IR into schools is complex and faces a range of challenges. This report seeks to provide an expansive and discursive exploration of these technologies' role in education by synthesizing the insights gained from the interviews.

2.2. Potential Benefits of A&IR in Education

This section explores three key areas where Augmented and Immersive Reality (A&IR) can transform education: enhancing engagement and motivation, promoting personalized learning and inclusivity, and fostering 21st-century skills. In particular, the interviews highlighted that A&IR technologies have the potential to significantly enhance student engagement, motivation, and learning outcomes by offering interactive and immersive educational experiences. Furthermore, A&IR enables personalized learning experiences, which can be especially beneficial for students with special educational needs, promoting inclusivity and equity. Finally, these technologies support the development of essential 21st-century skills, such as critical thinking, creativity, collaboration, and digital literacy, preparing students for success in a rapidly evolving, technology-driven world.



2.2.1. Enhancing Engagement and Motivation

A&IR technologies offer a highly interactive and immersive form of learning that appeals to students' senses and curiosity. Interviewees consistently highlighted the potential of these technologies to boost student engagement by making learning more dynamic and participatory. For instance, virtual environments can allow students to engage with abstract or complex content in ways that are visually and conceptually engaging. An often-cited example from the interviews involves the visualization of scientific concepts, such as anatomy or space exploration, where students can manipulate 3D models or engage in virtual experiments that are otherwise impossible in a traditional classroom setting.

The ability of A&IR to foster curiosity and maintain student attention through these immersive experiences aligns with research on multisensory learning, which shows that combining visual, auditory, and kinesthetic elements can enhance cognitive processing and memory retention. By offering novel ways to interact with content, A&IR is believed to have a positive impact on both short-term engagement and long-term motivation to learn.

2.2.2. Personalized Learning and Inclusivity

Another critical area where A&IR demonstrates significant potential is in providing personalized learning experiences. By enabling differentiated instruction, A&IR allows educators to tailor content to individual student's needs, offering unique opportunities for personalized feedback and instruction. This can be particularly beneficial for students with special educational needs, who may require alternative methods to access and understand content. The immersive nature of A&IR makes it possible for these students to engage with materials in ways that accommodate their learning preferences and needs, promoting inclusivity and equity in the classroom.

Many educators interviewed also emphasized the role of A&IR in supporting students with disabilities. For example, students with physical disabilities can participate in virtual field trips or lab simulations, enabling them to experience environments and activities that might otherwise be inaccessible. Similarly, students with learning disabilities or autism spectrum disorders could benefit from the multisensory nature of A&IR, which can provide alternative avenues for processing information and expressing understanding.



2.2.3. Fostering 21st-Century Skills

The development of 21st-century skills—such as critical thinking, creativity, problem-solving, and collaboration—is increasingly recognized as essential for students to succeed in the modern world. A&IR can play a crucial role in fostering these skills by enabling experiential and inquiry-based learning environments where students take on active roles in their education. Collaborative learning environments in VR, for instance, allow students to work together on complex problems, simulate real-world scenarios, or engage in creative projects that require teamwork and innovation.

Several educators pointed out that A&IR could serve as a powerful tool for fostering digital literacy, which is becoming a foundational skill for students. In interacting with A&IR technologies, students not only develop familiarity with digital tools but also learn to navigate and critically assess the intersection between the physical and digital worlds. This digital literacy, coupled with the soft skills promoted by A&IR experiences, equips students to thrive in increasingly technology-driven societies.

2.3. Challenges to the Adoption of A&IR Technologies in Schools

Despite the potential benefits of A&IR technologies, the interviews revealed several significant barriers to their widespread adoption in education. These challenges span technological, financial, pedagogical, and institutional dimensions. Overcoming these challenges will require collaborative efforts between policymakers, educational institutions, and technology providers to ensure the successful integration of augmented and immersive reality into the learning environment.

2.3.1. Financial Barriers and Resource Constraints

Perhaps the most prominent challenge to integrating A&IR technologies in schools is the high cost of the necessary equipment. Many interviewees reported that their institutions lack the financial resources to purchase VR headsets, AR-enabled devices, or the accompanying software. In addition to the initial investment in hardware, schools must also consider ongoing costs for maintenance, software updates, and technical support.

In many cases, educators expressed frustration over the lack of financial support for technological innovation in schools, particularly those in economically disadvantaged regions.



Even when external funding is available—through government grants, academic partnerships, or corporate sponsorships—the costs of maintaining and upgrading A&IR technologies can be prohibitive. Without a sustainable funding model, many schools are unable to commit to the long-term integration of these tools into their teaching practices.

2.3.2. Technological Infrastructure and Training Gaps

In addition to financial constraints, the successful integration of A&IR technologies requires substantial investments in technological infrastructure. Schools must ensure they have reliable Internet access, adequate digital devices, and the technical capacity to support A&IR applications. However, many interviewees noted that their institutions are not equipped to handle the bandwidth and connectivity demands of A&IR tools, particularly in rural or underserved areas.

A further challenge lies in the significant training and professional development required for educators to effectively use these technologies. Many teachers lack the technical skills and pedagogical strategies necessary to seamlessly incorporate A&IR into their teaching. This skill gap is particularly acute for older educators or those with limited experience in digital technologies. Interviewees emphasized the need for hands-on, practical training programs that not only teach the technical aspects of A&IR but also focus on the pedagogical integration of these tools to ensure they enhance learning rather than serve as mere novelty.

2.3.3. Pedagogical Challenges and Curriculum Alignment

The integration of A&IR technologies into education also faces challenges related to pedagogical practices and curriculum alignment. Many teachers expressed concerns that A&IR technologies, if not used thoughtfully, could distract from deeper cognitive engagement with the material. For example, while AR and VR tools can make learning more engaging, there is a risk that students might focus on the “wow” factor of the technology rather than the substantive content being taught. As a result, teachers must carefully balance the use of A&IR to ensure that it supports critical thinking and problem-solving rather than passive consumption of digital media.

In terms of curriculum design, many interviewees pointed out that the current educational structure often leaves little room for the integration of new technologies. Standardized testing, rigid curricular frameworks, and the pressure to meet specific learning objectives within tight timeframes make it difficult to experiment with A&IR tools in the classroom.



Teachers face the challenge of finding ways to integrate A&IR into their lessons without sacrificing required content or instructional time, a balancing act that can be difficult to achieve without institutional support.

2.3.4. Institutional Resistance and Lack of Support

A recurring theme in the interviews was the lack of institutional support for A&IR technologies. While many educators expressed personal interest and enthusiasm for using A&IR in their classrooms, they noted that their schools often lacked the vision or leadership to promote these innovations. Several teachers reported that their institutions viewed A&IR as experimental or niche rather than as a core educational tool, limiting the support available for integrating these technologies into mainstream practices.

Institutional resistance also stems from a reluctance to disrupt traditional teaching practices. Some interviewees suggested that more conservative or technophobic educators, particularly those with limited digital experience, might be skeptical of A&IR technologies, viewing them as unnecessary or even detrimental to learning. Addressing these concerns requires a cultural shift within schools that emphasizes the value of innovation and professional development.

2.4. Facilitating the Integration of A&IR in Education

To overcome these barriers and facilitate the widespread adoption of A&IR technologies in schools, several strategies emerged from the interviews. These strategies focus on improving access to resources, fostering professional development, and promoting a supportive institutional culture.

2.4.1. Professional Development and Teacher Training

A critical step in promoting A&IR adoption is providing educators with the training and support they need to feel confident in using these technologies. Interviewees emphasized the importance of hands-on training programs that allow teachers to explore A&IR tools in real classroom settings, offering guidance on how to align these technologies with curriculum goals and learning outcomes. Training should also focus on equipping educators with the pedagogical strategies necessary to integrate A&IR in ways that promote critical thinking, creativity, and collaborative learning.



Professional development programs should be continuous and accessible, ensuring that educators have ongoing opportunities to update their skills as technology evolves. Moreover, fostering collaboration and networking between schools, universities, and industry partners can help create a knowledge-sharing ecosystem where educators can exchange ideas and resources for implementing A&IR effectively.

2.4.2. Developing Low-Cost, User-Friendly Tools

Another key strategy is the development of low-cost, easy-to-use A&IR tools that are accessible to schools with limited financial and technical resources. Many educators expressed a belief that if such tools were available, more schools would be able to integrate A&IR into their everyday teaching practices. By creating scalable, affordable solutions, developers can lower the barriers to entry for schools and ensure that A&IR technologies are not confined to well-funded institutions.

Additionally, software platforms should be designed with user-friendly interfaces that allow teachers to integrate A&IR with minimal technical expertise. Simplified tools for content creation and customization can enable teachers to tailor A&IR experiences to their specific curricular needs without requiring advanced programming or design skills.

2.4.3. Promoting Institutional Support and Collaboration

Institutional leadership plays a pivotal role in fostering an environment where A&IR technologies can thrive. Schools that adopt a forward-thinking approach to technology and innovation are more likely to invest in A&IR, provide professional development opportunities, and encourage experimentation with new teaching methods. Administrators and policymakers must recognize the value of A&IR and create policies that support its integration into curricula and professional development programs.

Collaboration between educational institutions, government agencies, and technology companies can further promote the development and adoption of A&IR. Public-private partnerships may offer schools access to cutting-edge technologies and expertise, while government grants and funding initiatives can help mitigate the financial burden of implementation.



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3. Conclusion

The integration of A&IR in education holds immense potential for enhancing learning outcomes, promoting inclusivity, and fostering 21st-century skills. However, the adoption of these technologies is currently hindered by financial, technical, and institutional barriers. By addressing these challenges through targeted professional development, the development of affordable tools, and the promotion of a supportive educational culture, A&IR can be effectively integrated into classrooms, transforming the way students learn and engage with content.

Future research and policy efforts should focus on exploring scalable models for A&IR adoption, investigating the long-term impacts of these technologies on student learning, and developing frameworks for curriculum integration. As schools become increasingly digital, A&IR represents a critical frontier for innovation in education, offering new possibilities for immersive, interactive, and personalized learning.



Annex- Interviews carried out

Interview 1

Overview of Augmented and Immersive Reality

The teacher is fully aware of the potential of using augmented and immersive reality in the classroom, however, due to a lack of opportunities and possibilities, no experience has been gained as the school does not yet use any technology in the classroom.

The main challenges therefore include the funding opportunities and training offered in this area. In addition, the existing curricula are designed in such a way that there are only small (tiny) opportunities to incorporate new ideas and technologies.

The handling and use of such tools was initially perceived as critical because the possibilities were unfortunately not available until now.

However, it should be noted that the teachers are open to testing the tools in the area of augmented and immersive reality and trying them out together with their students.

Augmented and Immersive Reality practices in teaching experiences

There is no practical experience at this stage



Interview 2

Overview of Augmented and Immersive Reality

The interview with the teacher sheds light on the current status and potential of augmented and immersive reality (A&IR) at the school. Although the teacher knows about these technologies through colleagues in the IT sector, she notes that there is a lack of direct experience with these technologies in education, primarily due to limited financial resources and a corresponding lack of training programmes and opportunities to test the tools themselves.

The teacher emphasises that teachers' interest in A&IR tools is not easy to gauge due to the general lack of experience and familiarity with these technologies.

To improve competences in A&IR, the teacher suggests developing expertise through professional development opportunities and ensuring that the tools are user-friendly and adaptable to different teaching scenarios. The integration of these technologies should enhance lesson design and not replace traditional methods.

The teacher speculates that A&IR could potentially reduce dropout rates and improve inclusion if they increase motivation and readiness to learn. Positive effects in the classroom could include greater student enthusiasm and engagement, with digital tools appealing to different learning styles through multi-sensory stimulation.

Despite these potential benefits, the teacher acknowledges several limitations to implementing A&IR experiences, including cost, lack of skills, technological capabilities and device maintenance. Overall, the teacher shows interest in A&IR, but acknowledges that administrative and financial challenges currently hinder widespread adoption and experience with these tools in education.

Augmented and Immersive Reality practices in teaching experiences

She has not yet had any experience with augmented and immersive reality in the classroom, but the discussion with her colleague has already provided many theoretical concepts and approaches to how certain formats could be used (3D visualisation in maths, enabling different perspectives, muscle building and functions in sports - but all only in discussion with colleagues who are already interested in such techniques privately).

In addition, some ideas that were used during the pandemic to integrate visualisation in certain phases were tested, but she referred to this phase more as a pre-testing phase



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because the tools available at the time were very prone to failure or had the highest demo status.



Interview 3

Overview of Augmented and Immersive Reality

The teacher is not aware of any Augmented and Immersive Reality experiences implemented in Italian school education. This may stem from insufficient staff training. While some teachers, like the ones attending Fondazione San Paolo's courses, are proactive, others avoid technology due to lack of basic computer skills. Additionally, device shortages exacerbate the situation.

Augmented and Immersive Reality practices in teaching experiences

The teacher is not aware of any Augmented and Immersive Reality experiences implemented in Italian school education. This may stem from insufficient staff training. While some teachers, like her, are proactive, others avoid technology due to a lack of basic computer skills. Additionally, device shortages exacerbate the situation. As a support teacher, she has been working with a student with autism at the same school for three years. She has only used technology once during this time, demonstrating the size and proportions of dinosaurs to the children using a Google app on her cell phone, as she encountered difficulties with the school tablets.



Interview 4

Overview of Augmented and Immersive Reality

The teacher is familiar with augmented and virtual reality but does not know of any experiences of use in school education in Italy. He thinks one of the biggest problems is the digital competence of many teachers and the reluctance to use these technologies during lessons. He thinks it is important to use these technologies as support in school education as they can increase student engagement, changing the way of learning, making it more fun and interactive.

Augmented and Immersive Reality practices in teaching experiences

Being a professor of multimedia design, he teaches his students how to use these technologies in their fields (museum, cinema...). He has them use simple tools initially where basic digital skills are enough and then move on to more complex software where skills such as graphics, programming, modeling are needed. He believes that at the base of everything, the most important soft skill is creativity, without which good content cannot be created.



Interview 5

Overview of Augmented and Immersive Reality

The headmaster is aware of the opportunity offered by Augmented and Immersive Reality experiences implemented in Italian school education. On the other hand, it highlights the low skills and competences of teachers in the use of these technologies, highlighting the need to systemic training interventions for them. The headmaster emphasizes the importance of using augmented reality to develop curiosity and its potential application for the development of emotional intelligence. Moreover, thanks to its multimedia properties, it offers a multisensory learning experience in the subjects.

Augmented and Immersive Reality practices in teaching experiences

The practices are sporadic and arise from the school's collaborative relationships with organizations, universities and research bodies. Being able to participate in these experiences allows the school to appreciate the benefits in terms of effectiveness and learning even with individuals with special educational needs. Practical experiences also arise from the personal initiative of the teacher who, motivated by relationships with research organisations and institutions, introduces educational practices to be tested at school.



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Interview 6

Overview of Augmented and Immersive Reality

The teacher is aware of the potential of augmented and immersive reality experiences. There is a spot use of technology at school. Teachers need to be trained in the use of technology.

Augmented and Immersive Reality practices in teaching experiences

Practices arise from personal initiatives and knowledge or from the involvement of research bodies or organizations with which collaboration protocols are activated. The level of use is low and there is a need to upgrade skills in the use, maintenance and application of technologies in education.



Interview 7

Overview of Augmented and Immersive Reality

The teacher has little knowledge of A&IR nevertheless has an interest in the topic. The school is anchored in traditional teaching. There are no experiences. This is because the school was wired a short time ago and the only equipment besides the network infrastructure was the smartboard. The continuous turnover of teachers does not allow for the allocation of staff to the innovation of teaching practices through the use of technology.

Augmented and Immersive Reality practices in teaching experiences

There is no experience in the use of A&IR however there is interest of teachers in upgrading professional and practical A&IR use. The need for training and professional development is a requirement for promoting creative vision of problem solving in order to build new ways of teaching and learning that give the teacher the autonomy to develop creative didactics and ignite the student's curiosity.



Interview 8

Overview of Augmented and Immersive Reality

The respondent defines Augmented and Immersive Reality (A&IR) as the enhancement of physical reality through technology. They express unfamiliarity with A&IR experiences in their country's education system, attributing it to insufficient equipment and teacher training. Regarding teacher interest, they suggest it varies based on individual skills and competencies, alongside the time investment required. To improve A&IR competencies, the respondent suggests establishing dedicated labs and training programs for educators. While A&IR may not directly reduce dropout rates, it can enhance inclusivity. Positive effects in classrooms include increased engagement and emotional involvement. However, challenges such as technology scarcity and skill gaps, which require costly solutions, hinder implementation.

Augmented and Immersive Reality practices in teaching experiences

The interviewee indicates minimal impact of Augmented and Immersive Reality (A&IR) initiatives on their daily educational routine. They provide no specific actions toward A&IR development within their lessons or initiatives at their institution to enhance A&IR knowledge among teachers and students. Similarly, they do not share any successful A&IR initiatives or plans, nor do they indicate the frequency of A&IR learning activities promoted by their institution. Additionally, the interviewee expresses skepticism regarding the facilitation of A&IR adoption by easy-to-use, low-cost tools. They recognize Information and Communication Technology (ICT) as a crucial competency for A&IR implementation and emphasize soft skills such as creativity, critical thinking, learning to learn, and teamwork as essential for A&IR learning experiences. Overall, the interviewee's responses suggest limited engagement with A&IR and a lack of proactive efforts to integrate it into their educational practices.



Interview 9

Overview of Augmented and Immersive Reality

The interviewee defines Augmented and Immersive Reality (A&IR) as the integration of virtual elements into the real world. They note a lack of A&IR experiences in school education in their country due to the high costs associated with AR technology development. While they believe A&IR can enhance student engagement and facilitate teaching, they express skepticism about its potential to reduce dropout rates or improve inclusion. To improve A&IR competencies, the interviewee suggests investing in digital devices and smart laboratories. They highlight positive effects of A&IR in classrooms, such as increased efficiency and student engagement, fostering critical thinking and problem-solving skills. However, they acknowledge limitations in A&IR implementation, including costs and skill deficiencies. Overall, the interviewee recognizes the potential benefits of A&IR but underscores the challenges in its widespread adoption.

Augmented and Immersive Reality practices in teaching experiences

The interviewee expresses that Augmented and Immersive Reality (A&IR) initiatives significantly enhance their daily educational routine by providing a more engaging and stimulating learning environment. They utilize various platforms for A&IR development within their lessons, including online tests on platforms like Kahoot. However, their institution's efforts to increase A&IR knowledge among teachers and students are not specified, and A&IR learning activities are promoted rarely. The interviewee believes that easy-to-use, low-cost tools would facilitate A&IR adoption in daily learning activities. They identify efficient and responsible use of Information and Communication Technology (ICT) as crucial competencies for implementing A&IR learning experiences. Additionally, they emphasize soft skills such as planning and management, teamwork, cooperation, creativity, and critical thinking as essential for successful A&IR integration. Overall, while the interviewee highlights the benefits and potential of A&IR in education, they indicate limited institutional support and promotion of A&IR learning activities.



Interview 10

Overview of Augmented and Immersive Reality

The interviewee defines Augmented and Immersive Reality (A&IR) as a technology that integrates virtual elements into the real environment. They are unaware of A&IR experiences in school education in their country, attributing it to potential activities being limited to certain schools. The interest among teachers in utilizing A&IR in educational contexts is contingent upon the availability of appropriate resources in schools. To enhance A&IR competencies, they suggest implementing teacher training programs. The interviewee believes A&IR can contribute to reducing dropout rates and improving inclusion by leveraging students' attraction to devices and new technology. Positive effects of using A&IR in classrooms include reducing dropout rates and increasing student engagement in lessons. However, limitations in A&IR implementation, such as cost and skill deficiencies, are acknowledged. Overall, the interviewee underscores the potential benefits of A&IR while acknowledging the challenges in its widespread adoption due to resource constraints and skill shortages.

Augmented and Immersive Reality practices in teaching experiences

The interviewee reports that Augmented and Immersive Reality (A&IR) initiatives have a significant impact on their daily educational routine. They are currently focusing on introducing A&IR concepts to students. Their institution encourages teachers to familiarize themselves with A&IR and then convey the information to students. However, they do not share specific A&IR initiatives they have implemented or participated in. A&IR learning activities are not regularly promoted by their institution. The interviewee believes that easy-to-use, low-cost tools would facilitate A&IR adoption in daily learning activities. They identify digital skills as essential competencies for implementing A&IR learning experiences. Additionally, they highlight critical thinking, teamwork, creativity, and problem-solving as crucial soft skills for A&IR integration. Overall, while the interviewee acknowledges the importance of A&IR in education and recognizes the necessary competencies and skills, they provide limited insights into concrete A&IR initiatives and institutional support for A&IR learning activities.



Interview 11

Overview of Augmented and Immersive Reality

The interviewee defines Augmented Reality (AR) as technology enhancing the real environment with digital elements via mobile devices or special displays, while Immersive Reality encompasses engaging digital experiences. They acknowledge growing AR and Immersive Reality applications in Romanian education, including 3D visualization and educational games. Teacher interest varies based on factors like awareness, training, and resource availability. To enhance AR and Immersive Reality competencies, they suggest teacher training programs, resource development, industry partnerships, innovation spaces in schools, competitions, and financial support. They believe AR and Immersive Reality can reduce dropout rates and improve inclusion by enhancing engagement, personalization, collaboration, and contextualized learning. Positive effects in the classroom include increased engagement, understanding, personalization, collaboration, and interest. However, limitations such as cost, lack of competencies, curriculum integration, accessibility, and maintenance challenges exist.

Augmented and Immersive Reality practices in teaching experiences

The interviewee utilizes Augmented and Immersive Reality (A&IR) to enhance their educational routine, employing interactive techniques like simulations and educational games. They integrate technology extensively, utilizing digital tools for assessment and personalized feedback. Their institution promotes A&IR knowledge through collaborative projects with academic institutions or technology companies. While they haven't implemented specific A&IR initiatives, they believe easy-to-use, low-cost tools would facilitate adoption. Essential competencies for A&IR implementation include technical knowledge, digital skills, planning ability, collaboration, and communication. They highlight soft skills like creativity, flexibility, communication, patience, and perseverance as crucial for A&IR learning experiences. However, institutional A&IR learning activities are not yet promoted.



Interview 12

Overview of Augmented and Immersive Reality

The interviewee defines Augmented and Immersive Reality (A&IR) as the overlay of virtual content onto the real world to enhance cognitive processes. At "Radu Negru" Technological High School, A&IR experiences are conducted to align with the institution's specializations, focusing on virtual reality technology for knowledge accumulation. Teachers exhibit a strong interest in A&IR adoption for teaching and learning, leveraging it when suitable applications are available. To enhance A&IR competencies nationally, the interviewee suggests diversifying applications to cater to various technical fields. They believe A&IR can contribute to reducing dropout rates and improving inclusion by providing a user-friendly learning environment accessible to all students. Positive effects in the classroom include simplified learning methods and increased student engagement. The interviewee perceives no limitations to A&IR implementation, emphasizing the potential for diversified applications and content complexity.

Augmented and Immersive Reality practices in teaching experiences

The interviewee views A&IR initiatives as integral to their daily educational routine, considering virtual reality applications as an extension of their teaching activities. They align their lessons with A&IR elements to enhance learning experiences. The institution promotes A&IR knowledge among teachers and students by encouraging technology integration across disciplines and including it in programs like the "Different School Week." While specific A&IR initiatives are not mentioned, the institution regularly promotes A&IR learning activities. The interviewee believes that user-friendly, cost-effective tools would facilitate A&IR adoption in daily learning activities. They emphasize the importance of technical competencies, such as digital literacy and adaptability, for implementing A&IR experiences effectively. Additionally, they highlight soft skills like creativity, adaptability, and communication as crucial for successful A&IR implementation.



Interview 13

Overview of Augmented and Immersive Reality

The interviewee defines Augmented and Immersive Reality (A&IR) as the process of overlaying virtual content onto the real world. They note that some schools in their country utilize A&IR to allow students to explore subjects from various perspectives. While interest among teachers in A&IR is present, they suggest the need for an overview of its benefits, equipment procurement, and teacher training to improve A&IR competencies nationwide. They believe A&IR can reduce dropout rates and enhance inclusion by making classes more engaging and stimulating critical thinking and problem-solving skills. Positive effects of A&IR in the classroom include improving knowledge retention. However, limitations in implementation exist due to the lack of teacher trainers for A&IR education.

Augmented and Immersive Reality practices in teaching experiences

The interviewee indicates that A&IR initiatives have minimal impact on their daily educational routine, primarily due to limited application across disciplines. They utilize internet videos for certain subjects like technology and mathematics. Their institution promotes A&IR knowledge through informative sessions and discussions but hasn't implemented specific initiatives yet. They believe easy-to-use, low-cost tools would facilitate A&IR adoption. Critical thinking, problem-solving, and teamwork are deemed essential competencies for A&IR implementation. The most important soft skill highlighted is teamwork. Despite recognizing the potential benefits, the interviewee's current experience with A&IR remains limited.



Interview 14

Overview of Augmented and Immersive Reality

The interviewee views Augmented and Immersive Reality (A&IR) as innovative solutions to classroom challenges. However, they note a lack of A&IR experiences in their country's school education due to limited awareness. Despite this, there is significant interest among teachers. To improve A&IR competencies, they suggest skills development training. They believe A&IR can reduce dropout rates and enhance inclusion. Positive effects in the classroom include teamwork, enhanced research capabilities, and engaging lessons. Limitations include high costs and a lack of skills. Overall, while recognizing the potential of A&IR, the interviewee highlights the need for greater awareness, training, and affordability for widespread adoption.

Augmented and Immersive Reality practices in teaching experiences

The interviewee expresses an interest in A&IR initiatives, believing they would make lessons more attractive. However, they have not yet implemented any A&IR initiatives themselves. They acknowledge the importance of digital skills for A&IR implementation and believe easy-to-use, low-cost tools would facilitate adoption. While their institution hasn't promoted A&IR learning activities, they recognize the significance of competencies like creativity, critical thinking, teamwork, and learning to learn for A&IR implementation. Despite not yet utilizing A&IR in their teaching, the interviewee demonstrates openness to its potential benefits and emphasizes the importance of acquiring necessary skills for its integration into educational practices.



Interview 15

Overview of Augmented and Immersive Reality

The interviewee provides a comprehensive understanding of Augmented and Immersive Reality (A&IR), highlighting their potential in delivering real-time digital information and altering the user's reality. They note limited use of A&IR in Romanian education, citing high costs of devices and lack of teacher competencies as barriers. The interviewee emphasizes the need for educational policy changes to enhance A&IR competencies. They believe A&IR can reduce dropout rates and improve inclusion by offering personalized learning experiences. Positive effects in the classroom include increased student interest, interactivity, empathy, and inclusion. However, challenges such as cost, lack of competencies, and community resistance need addressing for successful implementation.

Augmented and Immersive Reality practices in teaching experiences

The interviewee expresses minimal exposure to Augmented and Immersive Reality (A&IR) initiatives in their educational routine, indicating its absence in their school. They are exploring gamification as an alternative teaching method. The institution does not prioritize A&IR knowledge dissemination, and there are no ongoing or planned A&IR initiatives. The interviewee believes that user-friendly, affordable tools would facilitate A&IR adoption. They emphasize the importance of educators' technical skills and methodological knowledge for successful implementation. Additionally, soft skills such as communication, critical thinking, and teamwork are deemed essential for A&IR learning experiences. Overall, the interview highlights the need for greater awareness and integration of A&IR in educational settings.



Interview 16

Overview of Augmented and Immersive Reality

The Augmented and Immersive Reality (A&IR) technologies emerge as tools that offer inclusive learning opportunities and focus attention on specific learning objects, engaging students and increasing learning motivation, particularly among students with lower performance. At the same time, the application of A&IR practices in my country's educational system is at a pilot stage due to the required high digital skills and the need for connectivity and educator training. The interest of educators in using A&IR is significant, but support and training are required regarding the technologies and their pedagogical use. Improving A&IR skills in my country requires training educators on both technological and pedagogical levels. A&IR can contribute to reducing school dropout rates by stimulating students' interest and supporting students with special needs. The positive effects of A&IR in the classroom include focusing attention on specific learning objects and increasing student interest and participation. However, there are limitations to the implementation of A&IR practices, such as cost, lack of skills, and the need for device maintenance. With the advancement of technology, their adoption is expected to increase on a broader scale.

Augmented and Immersive Reality practices in teaching experiences

Augmented and Immersive/Virtual Reality significantly impact daily educational routines, providing multisensory experiences and enhancing inclusive learning. As part of developing A&IR in their classes, they design lessons and create materials for collaborative and personalized learning. Promotion of A&IR learning activities by their institution is limited and usually driven by personal interest, through material creation and promoting idea exchange among educators and students. They have successfully implemented many A&IR initiatives, such as using ARTutor and creating VR exhibitions with ArtSteps. Developing user-friendly, accessible, and cost-effective A&IR tools will facilitate technology adoption in educational practice. Key skills for implementing A&IR learning practices include digital and educational knowledge, flexibility, and collaboration. Key soft skills for implementing A&IR learning practices include collaboration, communication, and creativity.



Interview 17

Overview of Augmented and Immersive Reality

A&IR technologies offer opportunities to enhance interactive education and learning. These technologies do not replace traditional education. A prerequisite for the use of A&IR is the elimination of barriers such as financial limitations, the preparation of additional classroom materials, the adoption of new teaching methods, and the resolution of security and privacy concerns. Increasing interest in use among teachers. Contributing factors to improving A&IR capacity in the country are professional training, building collaborative networks, sharing experiences. It is an important factor in reducing school dropout and enhancing inclusion since the use of A&IR improves communication between students and enhances student learning autonomy. Positive effects in the classroom include personalised learning, enhancing the artistic and creative element, increasing participation and collaboration and developing digital skills. Limitations and challenges in implementing (A&IR) practices in school education are the cost of equipment and maintenance, lack of skills and training.

Augmented and Immersive Reality practices in teaching experiences

Targeted A&IR initiatives in line with the time constraints of the teaching duration of the course and the need to cover the sections of the material to be taught. Actions towards the development of A&IR in courses are the creation of digital content, the development of educational applications and the providing of support to students. In order to enhance knowledge about A&IR among teachers/students the institution promotes: planning in-service training seminars, integrating A&IR in the curriculum, creating resources and educational materials, access to educational applications, participation in school activities and competitions. , the availability of easy-to-use, accessible and low-cost tools can contribute significantly to the adoption of Augmented and Virtual Reality (A&IR) in everyday learning activities. The most important competences, skills and knowledge needed to implement A&IR learning practices are technological knowledge, creativity and design, teaching skills, collaboration, and awareness. The most important soft skills and competences in implementing A&IR learning practices are: Flexibility and adaptability, emotional intelligence, creativity and innovation.



Interview 18

Overview of Augmented and Immersive Reality

In this interview, Augmented and Immersive/Virtual Reality (A&IR) are described as a technology that transforms reality through enriched or virtual elements. Reference is made to tools such as ARTutor from the AETMA Lab of the International Hellenic University and the Metaverse application. However, the lack of organised use of A&IR in school education is acknowledged due to problems such as difficulty in providing equipment and insufficient training of teachers. Despite the recognition of the importance of A&IR for inclusion and improvement of education, interest from teachers seems to be limited and problems such as cost and lack of technical support pose challenges to the implementation of A&IR in education. Nevertheless, the benefits of A&IR, such as increased motivation and the possibility of experience-based learning, are highlighted, with the potential to improve education and prepare students for the future.

Augmented and Immersive Reality practices in teaching experiences

The interviewee reports that A&IR initiatives have little impact on his/her daily educational routine, using them a few times within a school year. However, s/he sets out initiatives to develop A&IR in his/her lessons, including informing students and searching for information online. He/She also mentions the use of augmentation leaflets using ARTutor and their implementation during visits to neoclassical buildings in Athens. Regarding the support of knowledge about A&IR, he /she reports that there are no initiatives from his /her institution. However, he/she presents successful initiatives that he/she has implemented, such as the augmentation of textbook images and the use of brochures for educational visits. As for the frequency of promoting A&IR learning activities, he states that it is rare. Finally, he/she expresses the view that easy-to-use, low-threshold and low-cost tools would facilitate the adoption of A&IR in everyday learning activities.



Interview 19

Overview of Augmented and Immersive Reality

Augmented and Augmented/Virtual Reality (A&IR) represent two different technological approaches. The first combines digital elements with reality, while the second concerns entirely digital applications. Initiatives such as Augmented Assessment and the ARTutor application library have been applied in education, but content development faces challenges due to a lack of training. Educators' interest in A&IR is strong when off-the-shelf applications are available, but less so when content creation is required due to lack of training. Improving A&IR competencies requires organized training for instructional uses and content creation. A&IR can help reduce school dropout and enhance inclusion with access and use by all students. Positive effects of A&IR in the classroom include combining the real and digital worlds for creation, exploration and simulation. Limitations to implementing A&IR practices include the need for clear instructional objectives, technological infrastructure, and required teacher skills.

Augmented and Immersive Reality practices in teaching experiences

According to the interviewee, there is little impact of Augmented and Immersive/Virtual Reality (A&IR) initiatives on the daily educational routine. However, in their courses, teachers incorporate Augmented Reality (AR) in relevant projects. No information is provided on initiatives of their institution to enhance A&IR knowledge among teachers and students. In addition, on a personal level, they have been involved in creating AR digital posters to highlight local cultural and environmental heritage. However, there is no information on the frequency of promoting A&IR learning activities by their institution. Teachers believe that easy-to-use, low-threshold and low-cost tools would facilitate the adoption of A&IR in everyday learning activities. The main competencies and skills required to implement A&IR learning practices include collaboration, creativity, critical thinking, synthesis, analysis and exploration, while the most important soft skills include creativity, critical thinking, collaboration, reflection and adaptability.



Interview 20

Overview of Augmented and Immersive Reality

Augmented and immersive/virtual reality (A&IR) are technologies with positive results of use at all levels of education. A prerequisite for the use of A&IR is the elimination of barriers such as: lack of knowledge, lack of equipment, lack of ready-made educational applications, lack of free tools, lack of time, stress of completing the curriculum. Low interest among teachers in using A&IR. Factors to improve A&IR capabilities are: training of teachers, development of educational applications, availability of funds to subscribe to application platforms or to purchase equipment, curriculum shortening, collaboration between schools, development of educational applications, provision of technical assistance. The use of A&IR is a factor in reducing school dropout and enhancing inclusion because it allows: increased student interest, more active participation in the learning process, personalised teaching, collaboration and communication. Positive effects in the classroom are: increased student interest, more active participation in the learning process, easier acquisition of knowledge, improved school performance, development of digital skills and creativity. A&IR technologies also help teachers: to implement new teaching techniques and methods, to create activities for all students, to acquire various skills such as digital, leadership, organisational, professional development. Limitations and challenges in implementing A&IR practices in school education are: lack of knowledge (technologies, ways to use them), lack of time and motivation, pressure to cover the course syllabus, lack of equipment. , the reduced needs for school funding, equipment maintenance and software upgrades.

Augmented and Immersive Reality practices in teaching experiences

A&IR initiatives that affect the daily educational routine: Promotion of teacher training (AR Tutor). Actions to develop A&IR in lessons: teacher training. Actions of school to enhance knowledge about A&IR: teacher trainings, students' contact with A&IR in the IT lesson, students' visit to the Future Lab, of the Pedagogical Department of Primary Education of the University of the Aegean, students' participation in workshops. A&IR initiatives successfully implemented: development of an augmented reality application for binary system and coding (LayAR platform), world math day : treasure hunt type game, solving logic problems, use of QR Codes or Tale Blazer, training of teachers in the use of AR Tutor . The institution promotes A&IR learning activities when the opportunity arises. Convenient, affordable and low cost tools facilitate the adoption of A&IR in learning activities because we achieve: teacher facilitation, easier acquisition of school equipment. Current conditions: few tools free of charge, commercial tools provide limited possibilities for free use, commercial



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platforms change frequently, merge or cease to operate. The most important competences, skills and knowledge for implementing A&IR practices are: knowledge of the use of tools and their potential, knowledge for classroom use or for developing applications for lessons. Therefore, they are required: creativity skills, organization, team management, collaboration, resource management and experience. The most important soft skills and competences in implementing A&IR learning practices: critical thinking, communication, collaboration, creativity, planning skills, reflection, problem solving, leadership and flexibility.flexibility.



Interview 21

Overview of Augmented and Immersive Reality

Although the interviewee is aware of the two technologies (A&IR) and their differences, he is not aware of good practices that have been implemented in school education in his country. He thinks that some teachers are enthusiastic (the trained ones) and some are sceptical (lack of training and technophobia). There is a need for Education and Training, Creation of Training Programmes, Creation of Materials and Resources to improve A&IR competencies in the country. Augmented and Virtual Reality (A&IR) can be an important factor in reducing school drop-out and enhancing inclusion if used appropriately. Such techniques include personalised learning and inclusion enhancement. The use of A&IR technologies can create opportunities for educational approaches that promote participation, collaboration and personalised learning, with the aim of reducing early school leaving and enhancing the inclusion of all students. However, there are limitations such as costs, lack of skills and training, and limited availability of devices, particularly in schools with restricted resources.

Augmented and Immersive Reality practices in teaching experiences

For teachers and students, the integration of A&IR technologies in teaching can affect the daily educational experience with interactive teaching and adaptive learning. Teachers should and can attend seminars, online courses, or workshops to become familiar with A&IR technologies and best teaching practices. It is also helpful to participate in networks and communities where educators share ideas, experiences, and resources for implementing A&IR. The school has not developed activities in this area yet but they are planning to purchase a 3d camera and a set of VR glasses immediately. Since they do not have appropriate equipment, they organize Virtual Museum Visits to allow students to make virtual visits to museums and historical places that are not physically accessible and Simulated Labs using virtual environments to simulate lab experiments in science and math classes. The implementation of Augmented and Virtual Reality (A&IR) learning practices requires a wide range of competencies, skills and knowledge from teachers, such as:

- Technological knowledge and skills
- Design of Innovative Activities
- Teaching experience
- Classroom Management and Organisation



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- Critical Thinking and Evaluation
- Communication Skills.

There are several soft skills among which:

- Flexibility and Adaptability
- Good Communication
- Collaborative Work
- Social Skills



Interview 22

Overview of Augmented and Immersive Reality

Augmented Reality (AR) and Virtual Reality (VR) represent two different categories of technology that have revolutionised the way we interact with the world and the way we learn and teach.

Augmented Reality (AR):

- AR refers to the extension of the real world with virtual elements that can be displayed through mobile devices such as smartphones or tablets.
- It allows users to see the real world around them enriched with virtual objects, information or applications.

Virtual Reality (VR):

- VR refers to the creation of a virtual world that the user can enter and interact with through special devices, such as virtual reality helmets.
- It provides an immersive experience for the user, who feels that they are in a completely different environment from the real world.

Both technologies offer great potential in the educational field, enabling the creation of immersive learning experiences that encourage collaborative learning, creativity and deepening understanding.

Augmented and Immersive Reality practices in teaching experiences

Augmented and Immersive/Virtual Reality practices can be integrated into the teaching experience in many different ways. Several approaches can be used depending on the type of course, the topic and the learning objectives aimed at

1. Use of reality games either to facilitate understanding of concepts and processes or to develop collaborative skills through group games.
2. Using augmented reality applications to project information onto physical objects such as text, graphs or tables.
3. Creating immersive experiences through virtual reality, where students can explore different environments or have hands-on experiences that would not be possible in the real world.



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4. Use of augmented reality applications to create interactive lessons and provide feedback to students.
5. Use of virtual reality to develop and teach skills and practices in different areas, such as environmental education or vocational skills training.



Interview 23

Overview of Augmented and Immersive Reality

In the respondent's opinion, A&IR is an excellent resource and an integrative tool that can be used in various aspects such as architecture, research, and location scouting. The teacher believes that the phase of uncertainty and rejection with respect to these new technologies has passed leaving room for curiosity and interest. In order to disseminate these technologies, he argues, refresher courses for teachers would be needed to be activated by applying to the Ministry of Education for special calls that would allow them. The teacher sees A&IR as a stimulus for students with motor or expressive language difficulties who could find a facilitating channel of expression with these technologies. Not only that, for all other students the use of A&IR could be a channel between their world (cell phones, computers, etc.) and the world of school. These technologies could be especially useful for subjects such as geography, where students could have a more verisimilitude and concrete perception of the things being studied. The respondent, with respect to risks, thinks that the school setting with its implicit limitations would act as a deterrent in front of potential abuse. For costs, it depends on the tools one intends to use

Augmented and Immersive Reality practices in teaching experiences

The interviewee's daily life is not currently affected by A&IR initiatives. However, he would like to have the opportunity to use these technologies for courses such as film history to propose research to his students. The institution where he works does not consider these technologies as he believes they are too expensive, especially at a time like this when funds are limited. For this reason, no A&IR-related activities are promoted. Consequently, he believes that if these tools had lower costs, their adoption in different school settings would be facilitated. The respondent believes that the skills needed for eventual use of these technologies are basic writing and computer language. Certainly, however, critical thinking on the part of teachers would also be needed.



Interview 24

Overview of Augmented and Immersive Reality

In general, the respondent does not know of any school settings within which A&IR technologies are used. She confirms it to be, however, a debated and divisive topic among teachers, who on the one hand are concerned about the impact on children's concentration level due to the distractions that might arise in using such methods while on the other hand feel interested in a new way of teaching and stimulating children. Regarding her idea, the respondent believes that realities such as immersive virtual reality may, being so close to our own, cause feelings to be skewed and worries her that this may have the opposite effect to that hoped for and that school dropout and inclusion may instead of improving, worsen. She agrees with the use that could be made of these tools in all subjects from history to biology but is doubtful about the actual implementation in our school facilities, as it would not be easy to implement, for example, having tools such as oculus available for thirty children during a lesson. However, the interviewee is confident that with school and educational programs on how to better use such technologies and tools, the skills and knowledge one has of virtual and immersive reality can be improved.

Augmented and Immersive Reality practices in teaching experiences

The interviewee's daily routine in reference to the use of A&IR in the educational institutions she works with seems to be very limited. As a result, she is not accustomed to implementing these new technologies in her lessons, even though she recognizes their potential and believes that the lack of learning activities aimed at promoting the field of A&IR is due precisely to the institutes' lack of awareness of this potential. The teacher believes that the dissemination and adoption of easy-to-use and low-cost tools would enable teachers and schools to integrate the use of A&IR into their educational offerings. However, she believes that it would be necessary to train teachers in avoiding, and, if necessary, managing, any side effects due to misuse of such technologies during lessons. In addition, the respondent argues that prior to a specific training related to A&IR, teachers should be updated on digital technologies in general, since there is a clear and widespread lack of digital competences among them. Besides the technical aspects, she is convinced that teachers must develop soft skills such as empathy, critical thinking, active listening, and the ability to process experience if they truly want to accompany students during their journey into A&IR while making sure to avoid potential side effects.



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Interview 25

Overview of Augmented and Immersive Reality

Overall, the interviewee agreed upon the potential usefulness of A&IR technologies within educational contexts. On the one hand, she believes that these technologies can improve students' engagement and learning methods by stimulating their interest and attention and shaping the learning path into a more interactive, immersive, and enjoyable experience. On the other hand, she expresses some worries about the potential side effects of the over exposition to screens and the lack of in-depth analysis given by the use of A&IR technologies at schools. However, in her point of view the main difficulty is that the majority of teachers is not aware of the potentials offered by these technologies, and they lack in knowledge and skills to use them. Therefore, she is convinced that a structured hands-on training, as well as resources and support to help teachers integrate these technologies into their teaching practices is fundamental if we want them to truly exploit A&IR potentiality and become real change makers within the educational context.

Augmented and Immersive Reality practices in teaching experiences

The interviewee reported a lack of interest of her school toward A&IR technologies. Because of that, she is not particularly interested in including these technologies in her teaching methods. However, she provided useful insights, which could be used as a basis for the ARIES project's next activities. Firstly, she is convinced that these technologies are not easy-to-use, and this lead her (and probably her school) to give up on their implementation. Then, she suggested the following soft skills as those most necessary to deal with A&IR in schools: adaptability, collaboration, communication, and problem-solving.

Consider that she is a special education teacher (a support teacher) in a professional high schools for becoming cooks, waiters, employees for hotels, restaurants, ...



Interview 26

Overview of Augmented and Immersive Reality

In general, the respondent considers A&IR as a set of technologies related to virtual reality that allows one to visualize phenomena and gather notions in an interactive way. He has no firsthand knowledge of such experiences both because of lack of time and resources and the reluctant attitude of educational institutions and their teachers. He believes that interest is low especially in older teachers. Therefore, he believes that it would be necessary to make only willing teachers participate in the use of these tools by providing them with video tutorials for self-learning. According to the teacher, these technologies would allow for better inclusion and decrease of school-dropout phenomena. The limitation could be the teacher's lack of interest in learning about and using these new technologies, while a possible problem would be the issue related to students' privacy and personal data.

Augmented and Immersive Reality practices in teaching experiences

The respondent's daily life is no way influenced by A&IR, since the school he works for does not implement any kind of initiatives aimed at including these technologies in the learning offer. However, he believes that lower costs and easy-to-use tools could facilitate the introduction of A&IR in institutions. In the teacher's opinion, necessary elements would be the willingness to experiment new teaching methods with an open-minded approach, along with soft skills such as communication and creativity.



Interview 27

Overview of Augmented and Immersive Reality

Augmented Reality (AR):

- AR enhances the real-world environment by overlaying digital information, such as images, videos, or 3D models, onto it.
- AR can be experienced through smartphones, tablets, smart glasses, or headsets, allowing users to interact with digital content in their physical surroundings.

Virtual Reality (VR):

- VR immerses users in a completely virtual environment, replacing the real world with a simulated one.

Both AR and VR offer unique benefits and applications, and they can be used separately or in combination to create mixed reality (MR) experiences.

Some key benefits of A&IR technologies include:

- **Enhanced Engagement:** A&IR experiences are highly immersive and interactive, capturing users' attention and encouraging active participation.
- **Improved Learning Outcomes:** A&IR technologies can enhance learning experiences by providing hands-on, experiential learning opportunities that cater to diverse learning styles.
- **Real-World Applications:** A&IR technologies have practical applications across various industries, allowing users to visualize and interact with digital content in real-world contexts.
- **Innovative Solutions:** A&IR technologies are driving innovation and creativity, enabling new forms of storytelling, entertainment, communication, and problem-solving.

Augmented and Immersive Reality practices in teaching experiences

Practices in Teaching:

- **Experiential Learning:** AR and VR enable experiential learning by providing students with opportunities to actively engage with content and explore concepts in a hands-on manner.



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- **Personalized Learning:** Educators can customize AR and VR experiences to meet individual learning needs, providing tailored instruction and feedback.
- **Collaborative Learning:** AR and VR platforms can facilitate collaborative learning experiences, allowing students to work together in virtual environments regardless of physical location.
- **Simulation and Practice:** VR simulations can provide safe and controlled environments for students to practice skills that would be challenging or costly to replicate in real life, such as medical procedures or engineering design.
- accessible and engaging.



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Interview 28

Overview of Augmented and Immersive Reality

Teachers have from general to little understanding of what is Augmented and Immersive reality. The main reasons of the situation they see the lack of promotion, teachers' knowledge and limited schools' financial resources. Teachers agree that A&IR can help with the students' inclusion. Overall, the view is skeptical as that could be a huge waste of time and money as the result is hard to measure. Also, the primitive approach towards learning teaches no creativity, students are not forced to think critically and develop opinions.

Augmented and Immersive Reality practices in teaching experiences

Almost no practice and experience.



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Interview 29

Overview of Augmented and Immersive Reality

The teacher is fully aware of the potential of using augmented and immersive reality in the STEM classroom.

The main challenges therefore include the funding opportunities, language (English) and training offered in the country.

In addition, A&IR play a significant role in enhancing education by making learning more accessible and engaging for students with diverse needs, which in turn could help reduce dropout rates

Finally, the teacher is optimistic about use of augmented and immersive reality and trying them out together with their students

Augmented and Immersive Reality practices in teaching experiences

There is some experience in using MERGE EDU tool.



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Interview 30

Overview of Augmented and Immersive Reality

The teacher is fully aware of the potential of using augmented and immersive reality in the classroom.

However, due to a lack of knowledge and tools accessibility the use of A&IR is almost none.

The main challenges include the funding opportunities and promotion offered. However, the teacher sees the opportunity to use students' smartphones for the educational purposes. Also, there are some doubts about using A&IR for the content-based learning.

The teacher agrees that A&IR visualization will motivate students, however, only temporally.

Augmented and Immersive Reality practices in teaching experiences

There is little practical experience of using A&IR as the teacher believes it is meant to be for small children and the process of learning should include more than funny activities.



Interview 31

Overview of Augmented and Immersive Reality

The teacher is fully aware of the potential of using augmented and immersive reality in the classroom.

However, because of lack of knowledge and access to the A&IR tools opportunities no experience has been gained.

The main challenges include the training offered in the country.

In addition, the existing curricula are designed in such a way that there are only small (tiny) opportunities to incorporate new ideas and technologies.

The teacher is optimistic about using the tools as she sees the potential in personalized teaching and learning.

Augmented and Immersive Reality practices in teaching experiences

There is some practical experience in using A&IR tools. The knowledge has been gained through self-education.