# AR and VR in Education Market to Surpass USD 75 Bn by 2033, North America Leads at 35%

By 2033, the AR and VR in Education Market is expected to reach USD 75 Bn, up from USD 14.3 Bn in 2023, driven by an 20.2% CAGR.

NEW YORK, NY, UNITED STATES, January 27, 2025 /EINPresswire.com/ -- Based on data from Market.us, The AR (Augmented Reality) and VR (Virtual Reality) in education market is a rapidly expanding area within the educational technology sector. This market leverages AR and VR technologies to create immersive and interactive

Global Augmented and Virtual Reality in Education Market

Size, By Deployment Mode, 2024–2033 (USD Billion)

■ Cloud ■ On-Premises

11.9 | 14.3 | 17.2 | 20.6 | 24.8 | 29.8 | 35.9 | 43.1 | 51.9 | 62.4 | 75.0
2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033

The Market will Grow At the CAGR of: **20.26%** The Forecasted Market Size for 2033 in USD: **$75.0 B** market.us ONE STOP FOR THE REPORTS

AR and VR in Education Market Growth

learning experiences that go beyond traditional teaching methods. These technologies are applied in various educational settings, from K-12 to higher education, enhancing the way subjects are taught and experienced by students.
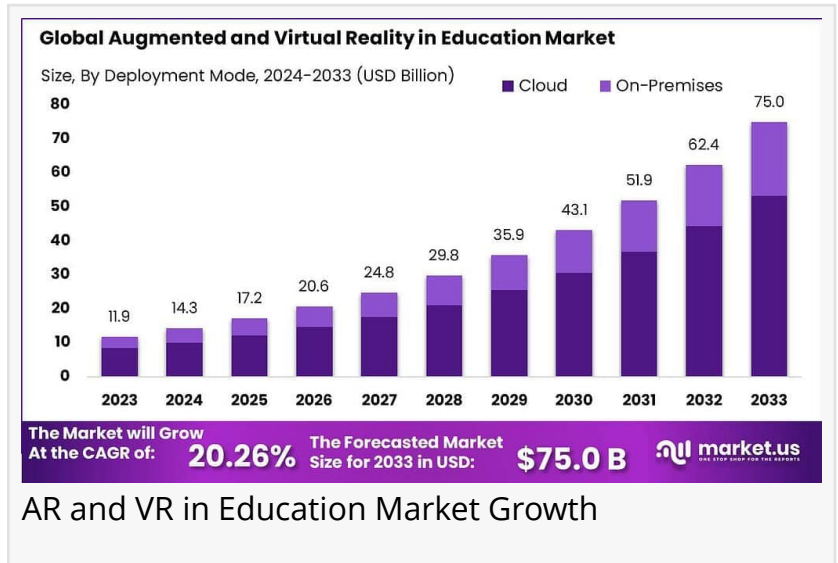
> "
> The higher education segment emerges as a dominant player, with over 60% of US colleges expected to offer at least one VR-based course by 2024, compared to less than 30% in 2022. "
>
> *Tajammul Pangarkar*

The primary drivers of growth in the AR and VR education market include the technological advancements that make these tools more accessible and effective for educational purposes. The increasing desire for experiential learning, where students can visualize concepts and interact with educational content in a dynamic way, significantly contributes to the adoption of these technologies. Additionally, the ongoing digital transformation in education, supported by educational institutions' investment in technology, fuels the growth of this market.

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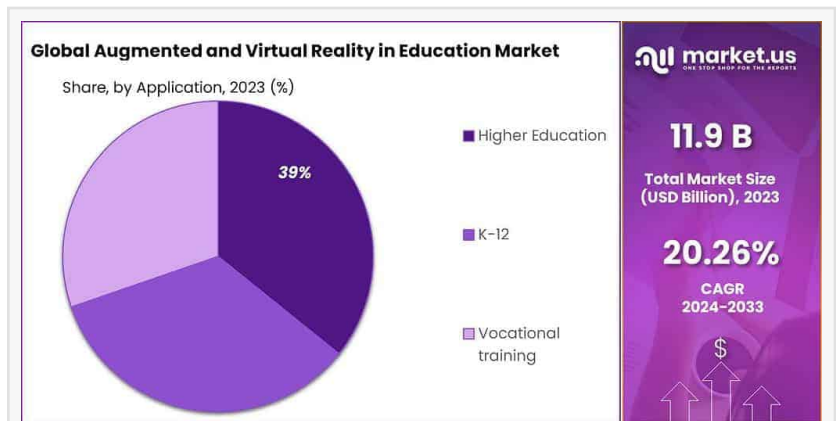
There is a notable trend towards the integration of AR and VR technologies in classrooms as a standard part of the educational process. This integration is particularly evident in higher education and vocational training, where immersive technologies offer substantial benefits for complex subject matter, including medical and engineering education. These technologies are also becoming more prevalent in remote learning environments, providing a tactile presence to distance education.

Demand for AR and VR in education is driven by the need for more engaging and interactive learning environments that can improve student outcomes and increase motivation. Schools and universities are increasingly investing in AR and VR to provide students with realistic simulations and virtual environments, which are particularly useful for technical disciplines like medicine, engineering, and science.

AR and VR in Education Market Share

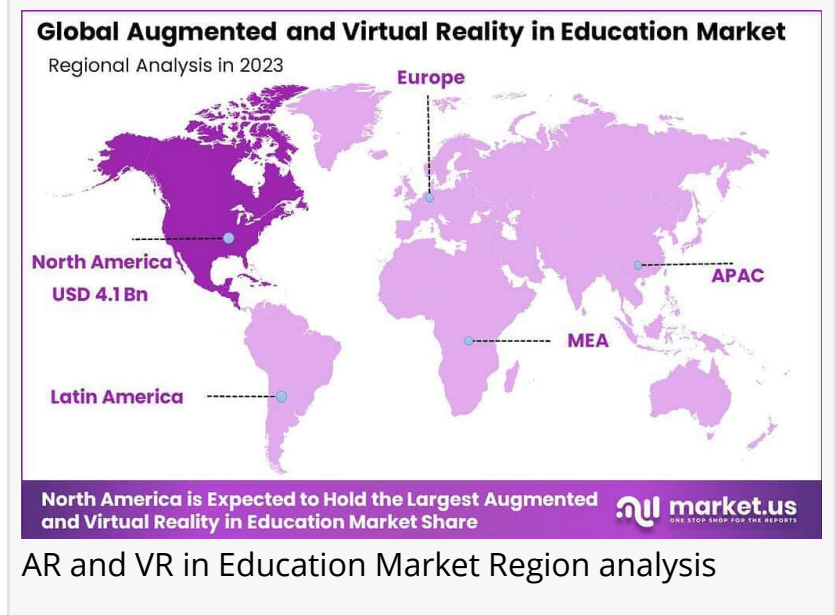AR and VR in Education Market Region analysis

Stakeholders in the AR and VR education market, including educational institutions, technology providers, and students, benefit from the enhanced learning experiences these technologies provide. Educators are able to deliver content in more engaging ways, which can lead to better learning retention. Students benefit from the hands-on experience and the ability to visualize complex subjects. Technology providers are seeing growing markets for their products as educational institutions continue to invest in these advanced learning tools.

Key Takeaways

Significant growth in AR and VR implementation is expected in K-12 schools, with over 40% projected to adopt these technologies by 2024, up from less than 20% in 2022.

93% of teachers see VR as beneficial for classroom teaching, showing strong support for immersive tech in education.

Education-focused VR software revenue is set to exceed $300 million globally by 2024, reflecting

increasing demand for customized solutions in the education sector.

European VR education startups are expected to see a 30% increase in funding in 2023-2024, indicating confidence in VR's potential in education.

In higher education, over 60% of US colleges are projected to offer at least one VR-based course by 2024, up from under 30% in 2022, showcasing the growing importance of immersive learning.

Hardware and cloud solutions lead the market, with interactive whiteboards, portable controllers, and VR devices capturing over 65% of the market share in 2023. Cloud-based deployment dominates at 71% due to its scalability and cost-effectiveness.

North America holds the largest market share, leading the AR/VR education sector with over 35% in 2023, supported by robust infrastructure, investments, and early adoption by schools and universities.

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Analyst's Viewpoint

Market Opportunities and Risks

The education sector is undergoing a major transformation with the integration of AR and VR, which are not just enhancing but reshaping traditional learning environments through immersive and interactive experiences. The market for these technologies is expected to grow significantly over the next decade, driven by increasing adoption in K-12 and higher education. AR and VR's ability to simulate complex real-world environments offers immense potential, especially for fields like medicine, engineering, and architecture, making learning more engaging and effective.

However, there are risks involved, primarily related to the high initial costs for setting up AR and VR systems in educational institutions. Additionally, there's a dependency on the continuous development of software and hardware that needs to keep pace with educational needs. The effectiveness of these technologies is also contingent on the quality of content and the learning platforms' ability to integrate seamlessly into existing educational frameworks.

Key Applications

AR and VR are revolutionizing education by offering innovative ways to teach various subjects. For example, VR can take students on virtual trips to historical landmarks or through space, while AR can enhance textbooks with additional info or allow virtual dissections in biology. These

technologies are especially powerful in STEM education, where they help visualize and interact with complex concepts, improving both understanding and knowledge retention.

Consumer Awareness and Regulatory Environment

Consumer awareness regarding the benefits of AR and VR in education is growing, spurred by positive outcomes in learner engagement and knowledge retention. As the technologies become more mainstream, educational institutions are increasingly adopting AR and VR to stay competitive and offer enhanced learning experiences.

Regulatory environments are also evolving to support the safe and effective use of these technologies in education. For example, in regions like Japan and South Korea, regulatory frameworks are being streamlined to foster innovation and facilitate the integration of AR and VR into educational settings. This includes ensuring privacy and security standards are met, which is crucial for gaining the trust of educational institutions and end-users.

Impact Of AI

Personalized Learning Experiences: AI enables the personalization of learning experiences in AR and VR settings, adapting educational content to meet the individual needs of students. This approach helps in tailoring the pace and style of learning to each student, enhancing their understanding and retention of knowledge.

Immersive Learning Environments: AR and VR technologies create highly immersive learning experiences that allow students to explore complex concepts in a visually engaging and interactive manner. For instance, students can participate in virtual dissections or explore historical sites without leaving the classroom.

Enhanced Engagement and Interactivity: By simulating real-world environments and scenarios, these technologies make learning more engaging and memorable. They also enable hands-on experiences where students can practice skills and solve problems in a controlled virtual space.

Accessibility and Inclusivity: The use of AR and VR in education is particularly transformative for students with disabilities, offering them ways to engage with learning materials that might otherwise be inaccessible. These technologies can adapt to various learning disabilities, enhancing educational accessibility and inclusivity.

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Regional Analysis

In 2023, the North American region dominated the AR and VR in education market, securing

more than 35% of the market share. This equated to a substantial value of USD 4.1 billion, positioning North America as a leader in the integration of augmented reality (AR) and virtual reality (VR) technologies within educational settings.

North America's significant market share is driven by its strong technological infrastructure, enabling widespread adoption of AR and VR in education. The region's educational institutions are increasingly investing in these technologies to improve learning outcomes, leading to greater funding and initiatives to integrate AR and VR into classrooms and curricula.

The presence of major AR and VR technology providers in North America has further fueled growth in the sector. These companies are advancing the technology and partnering with educational institutions to create customized solutions. These collaborations are key to tailoring AR and VR applications to specific educational needs, boosting adoption and enhancing learning through immersive and interactive experiences.

Market Segmentation

Offering Analysis

In 2023, the hardware segment led the Augmented Reality (AR) and Virtual Reality (VR) market in education, accounting for more than 65% of the market share. This dominance can be attributed to the growing adoption of advanced VR headsets, AR glasses, motion tracking devices, and other hardware that enable immersive learning experiences.

Deployment Mode Analysis

In the same year, the cloud segment captured more than 71% of the AR/VR in education market. Cloud computing offers several advantages, including easy storage, scalability, and the ability to deliver content and applications seamlessly across multiple devices. For AR/VR in education, the cloud enables educators and students to access high-quality virtual and augmented environments from anywhere, without requiring heavy computing power on individual devices.

Application Analysis

The higher education sector emerged as the largest market for AR/VR in education in 2023, with over 39% of the market share. Universities and colleges are leveraging AR/VR to enhance learning through simulations, virtual labs, and immersive environments that replicate real-world scenarios. These technologies are particularly valuable in fields such as medicine, engineering, architecture, and history, where hands-on or experiential learning is crucial.

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Emerging Trends

Immersive Virtual Field Trips: Schools are using VR to take students on virtual field trips, allowing them to explore places like historical sites or outer space without leaving the classroom. This approach makes learning more interactive and memorable.

Simulation-Based Learning: AR and VR enable students to engage in simulations that replicate real-world scenarios, such as historical events or scientific phenomena, providing immersive experiences that enhance understanding.

Personalized Learning Experiences: AR and VR technologies are being used to create personalized learning experiences, allowing students to learn at their own pace and according to their individual needs.

Integration of Advanced Technologies: The adoption of advanced technologies like Apple's Vision Pro and Meta's Quest 3 in higher education exemplifies the transformative potential of VR and AR, providing interactive and immersive learning opportunities.

Growth in Educational Technology Companies: Companies like Avantis are experiencing significant growth due to rising demand for VR in schools, indicating a broader trend of integrating immersive technologies into education.

Top Use Cases

Virtual Field Trips: Students can explore places like historical landmarks or outer space without leaving the classroom. For instance, Google Expeditions allowed students to take virtual trips to various destinations.

Medical Training Simulations: Medical students practice procedures in realistic, controlled environments using VR. St. John's University, for example, uses lifelike mannequins and VR setups to simulate emergencies.

Historical Reenactments: AR brings history lessons to life by overlaying digital information onto real-world settings, helping students visualize and interact with historical events.

STEM Education: AR and VR make complex STEM subjects more understandable by allowing students to interact with 3D models, such as molecules or engines, enhancing their grasp of intricate concepts.

Language Immersion: VR creates immersive environments where students can practice new languages in virtual settings, improving their conversational skills and cultural understanding.

Major Challenges

High Costs: Creating quality AR/VR content and acquiring the necessary hardware can be expensive, making it hard for many schools to afford.

Technical Difficulties: AR/VR systems can be complex, requiring advanced technical skills to develop and maintain. Issues like hardware malfunctions or connectivity problems can disrupt learning.

Health Concerns: Extended use of AR/VR can lead to discomforts such as headaches, motion sickness, and eye strain. It's important to take breaks and limit exposure to prevent these issues.

Limited Accessibility: Not all students have access to the necessary hardware or internet connection required to use AR/VR technologies, which can limit their ability to participate in eLearning activities that use these tools.

Safety Concerns: In immersive environments, users might become unaware of real-world surroundings, leading to potential accidents or injuries.

Market Opportunities for Key Players

Augmented Reality (AR) and Virtual Reality (VR) are transforming the education sector. With increased access to advanced technology, there are new opportunities for both educators and students.

1. Enhanced Classroom Learning: AR and VR can create immersive learning environments, making education more engaging. Students can take virtual field trips, explore historical events, or practice lab experiments in a safe, controlled setting. This hands-on approach helps deepen understanding and improves knowledge retention.

Opportunity: Schools and universities can invest in AR/VR-based curriculum tools to enrich the learning experience and cater to different learning styles.

2. Virtual Training and Simulations: In fields like medicine, aviation, and engineering, practical training can be expensive or dangerous. VR enables students to practice real-world scenarios in a virtual setting, offering hands-on experience without the risks or costs of physical training.

Opportunity: Companies can offer VR simulation platforms for training, helping institutions prepare students for complex tasks in a safe and effective manner.

3. Remote Learning and Accessibility: AR and VR can bridge the gap for students in remote locations or those with special needs. Virtual classrooms and AR-powered content can make education more accessible and personalized, allowing students to learn at their own pace, from

anywhere.

Opportunity: There's a growing demand for AR/VR-based remote education tools that provide flexible, inclusive, and customizable learning experiences.

4. Interactive Assessments and Feedback: AR and VR can provide instant, interactive feedback during assessments, allowing for more dynamic testing methods. These technologies make it possible to assess a student's skills in real-time, offering a more accurate reflection of their abilities.

Opportunity: Schools and educational tech companies can develop AR/VR solutions to support interactive assessments and provide personalized feedback to students.

Market Companies

- Meta
- Google
- Microsoft Corporation
- Magic Leap, Inc.
- Sony Group Corporation
- Panasonic Holdings Corporation
- HTC Corporation
- Vuzix Corporation
- Lenovo
- Anthology Inc.
- Avantis Systems Ltd
- DAQRI LLC
- Samsung Electronics Co. Ltd
- Other Key Players

Recent Acquisitions in AR and VR for Education

In January 2024, Kahoot!, a game-based learning platform, was acquired by a group of investors led by Goldman Sachs for $1.7 billion. This move aims to expand Kahoot!'s reach into international markets, enhancing its educational tools.

In February 2024, Madison Industries purchased CAE Healthcare for $230.8 million. This acquisition focuses on expanding medical simulation and training solutions, which are crucial for educational purposes in healthcare.

In February 2024, Instructure, known for its Canvas learning management system, acquired Parchment for $835 million. This acquisition enhances its offerings in credential verification and e-portfolios, thus strengthening its position in the education sector.

In March 2024, Cornerstone acquired Tailspin, an AI virtual learning platform offering VR training and AR performance support. This acquisition aims to enhance Cornerstone's capabilities in immersive learning environments.

In March 2024, Learneo's acquisition of Barnes & Noble Digital Student Solutions for $300 million consolidates various online learning resources under one umbrella, enhancing digital education offerings.

Conclusion

In summary, the integration of AR and VR in education is revolutionizing the way students interact with learning materials, offering immersive, hands-on experiences that deepen understanding and engagement. These technologies provide unique opportunities to simulate real-world scenarios, enhance complex subjects, and foster experiential learning, which traditional methods may struggle to achieve. By incorporating AR and VR, educators can cater to diverse learning styles, improving retention and motivation.

Furthermore, the growing accessibility and affordability of AR and VR tools are expanding their reach, making them more practical for schools and institutions across various levels. As the market continues to evolve, these technologies are expected to play an increasingly significant role in shaping the future of education, bridging gaps between theoretical knowledge and practical application while preparing students for an increasingly digital world.

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