MIRACLE

coMics and IllustRations Augmented to tackle CLimate change in primary Education

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MIRACLE Needs Analysis Report

Introduction

This report presents the findings of a Needs Analysis Questionnaire conducted as part of Work Package 3, aimed at assessing the readiness and requirements of educators for implementing AR in their classrooms. With 35 respondents from diverse educational and technological backgrounds, the questionnaire provides valuable insights into the demographics of potential AR users, the digital tools currently in use, and the levels of experience and comfort with AR technologies. Furthermore, the report explores the desired features of an AR classroom, the subjects most likely to benefit from AR, and the support systems educators need to effectively adopt this technology.

By analysing these findings, this report not only highlights the opportunities and challenges associated with AR integration but also offers strategic recommendations to ensure that AR tools are implemented successfully, enhancing the educational experience for both teachers and students.

Miracle team was working hard on the branding and upon several iterations, the logo for the project was selected as the one representing the ambition and creativity of the team as well as the comics side of the project:

Demographic Overview

The questionnaire was completed by 35 respondents. A significant majority of respondents (40%) were aged between 45-54, with the next largest group being aged 35-44 (22.86%). There was a substantial gender representation, with 57.14% identifying as women and 37.14% as men. The respondents were distributed across various organisations, including educational institutions and technology companies, reflecting a diverse mix of educators and technology specialists.
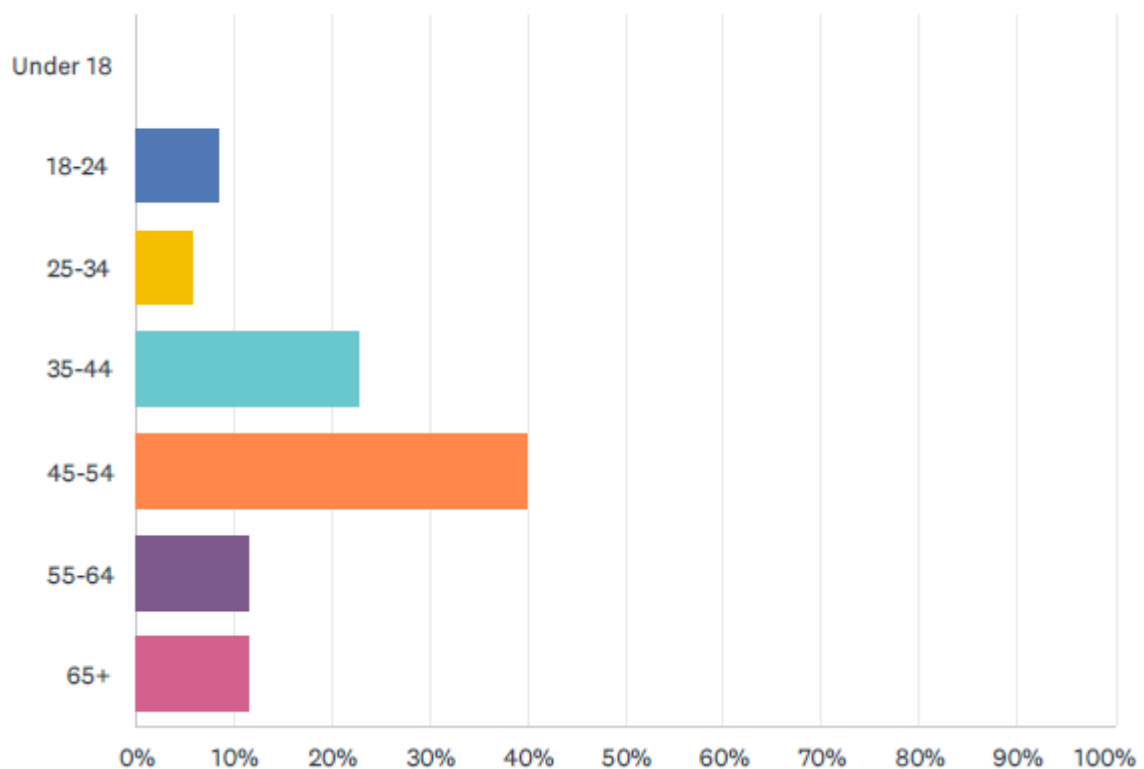
ANSWER CHOICES	RESPONSES
Man	37.14%
Woman	57.14%
Rather not say	2.86%
Other (please specify)	2.86%

Below is a geographical coverage of the participants for this survey:
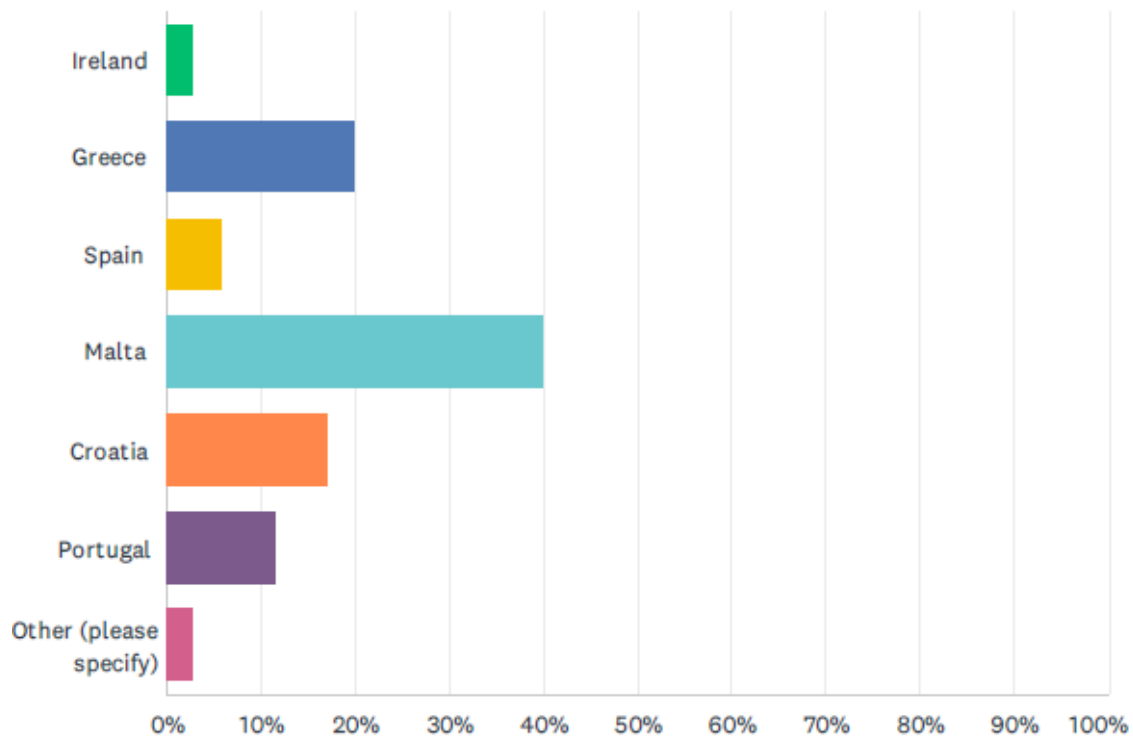
Current Use of Digital Tools

The survey revealed that digital tool usage is prevalent in classrooms, though the specific tools currently in use were not detailed in the data provided. The widespread adoption of digital tools suggests a foundational readiness among educators for integrating new technologies like AR into their teaching practices.

Familiarity and Experience with AR Tools

A crucial aspect of the survey was understanding the respondents' familiarity and experience with AR tools. Interestingly, 63.64% of the participants reported that they had not used AR tools in their teaching, while 36.36% had some experience with AR. Those who had used AR tools provided mixed feedback on their experiences. Some noted the potential of AR to enhance student engagement through interactive 3D models and immersive experiences, while others highlighted challenges such as the steep learning curve and the need for more comprehensive support and training.

Have you used augmented reality (AR) tools in your teaching?

Answered: 33   Skipped: 2
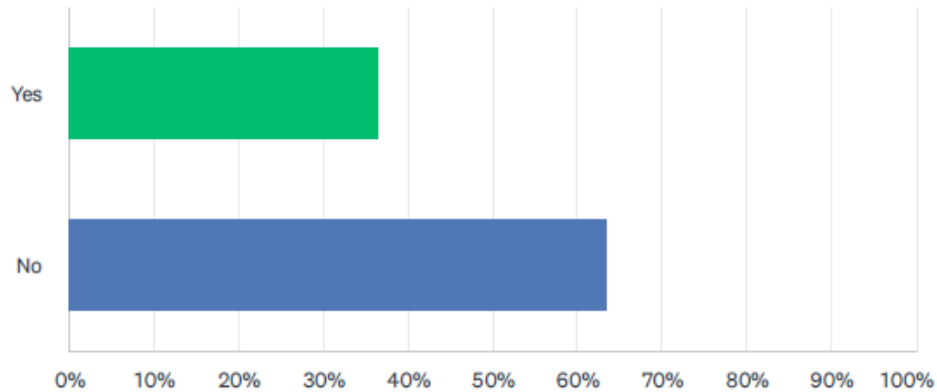
Desired Features in an AR Classroom

Respondents were asked about the features they would find most useful in an AR classroom. The most popular feature, selected by 29.41% of respondents, was the integration of interactive 3D models. This was closely followed by AR content creation tools (26.47%) and collaboration features for students (26.47%). The desire for integration with existing curricula was also noted by 29.41% of respondents, indicating a strong preference for AR tools that complement and enhance current teaching methods rather than requiring entirely new approaches.

What features would you find most useful in an AR Classroom?

Answered: 34   Skipped: 1
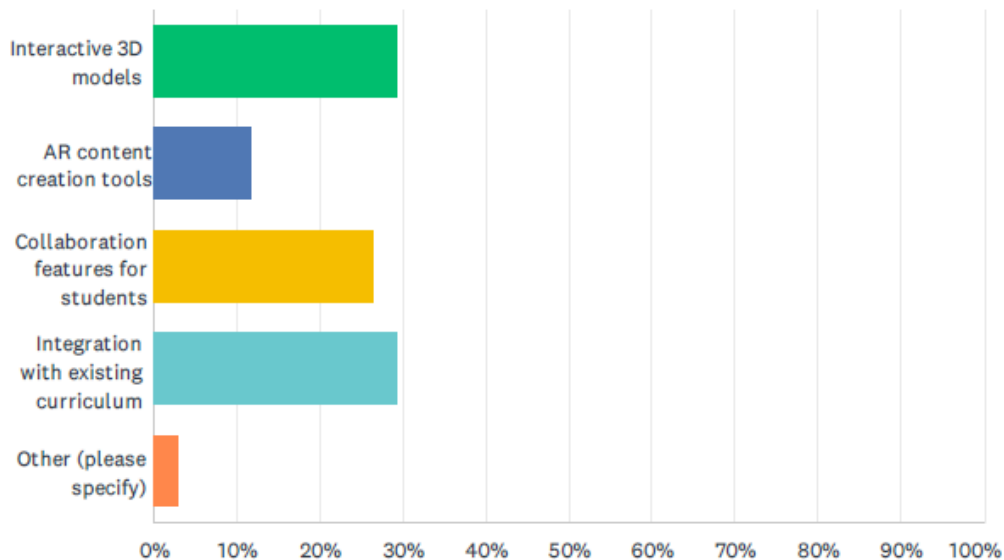
Importance of Features in a Multi-Access Classroom (MAC)

The survey further explored the importance of various features in a Multi-Access Classroom (MAC), which includes both AR and non-AR elements. Easy navigation was deemed "very important" by 76.47% of respondents, emphasising the need for intuitive and user-friendly interfaces in educational technology. Interactive content was also highly valued, with 63.64% rating it as "very important." Discussion forums and regular assessments were considered important by 45.45% and 32.35% of respondents, respectively, while certification upon completion was seen as important by 47.06%.

|	NOT IMPORTANT	SLIGHTLY IMPORTANT	IMPORTANT	VERY IMPORTANT	(NO LABEL)	TOTAL	WEIGHTED AVERAGE
Easy navigation	0.00% 0	2.94% 1	20.59% 7	76.47% 26	0.00% 0	34	3.74
Interactive content	0.00% 0	3.03% 1	33.33% 11	63.64% 21	0.00% 0	33	3.61
Discussion forums	3.03% 1	21.21% 7	45.45% 15	30.30% 10	0.00% 0	33	3.03
Regular assessments	5.88% 2	17.65% 6	44.12% 15	32.35% 11	0.00% 0	34	3.03
Certification upon completion	5.88% 2	5.88% 2	41.18% 14	47.06% 16	0.00% 0	34	3.29

Subjects and Topics Most Benefiting from AR

When asked about specific subjects or topics that would benefit most from AR tools, science emerged as the leading area, with 76.47% of respondents identifying it as a key beneficiary. This was followed by mathematics (47.06%), history (44.12%), and geography (55.88%). Art was also mentioned by 47.06% of respondents, highlighting the broad applicability of AR across various disciplines. The strong preference for science and mathematics indicates a recognition of AR's potential to make abstract concepts more tangible and easier to understand.

What specific topics or subjects would benefit most from AR tools?

Answered: 34   Skipped: 1
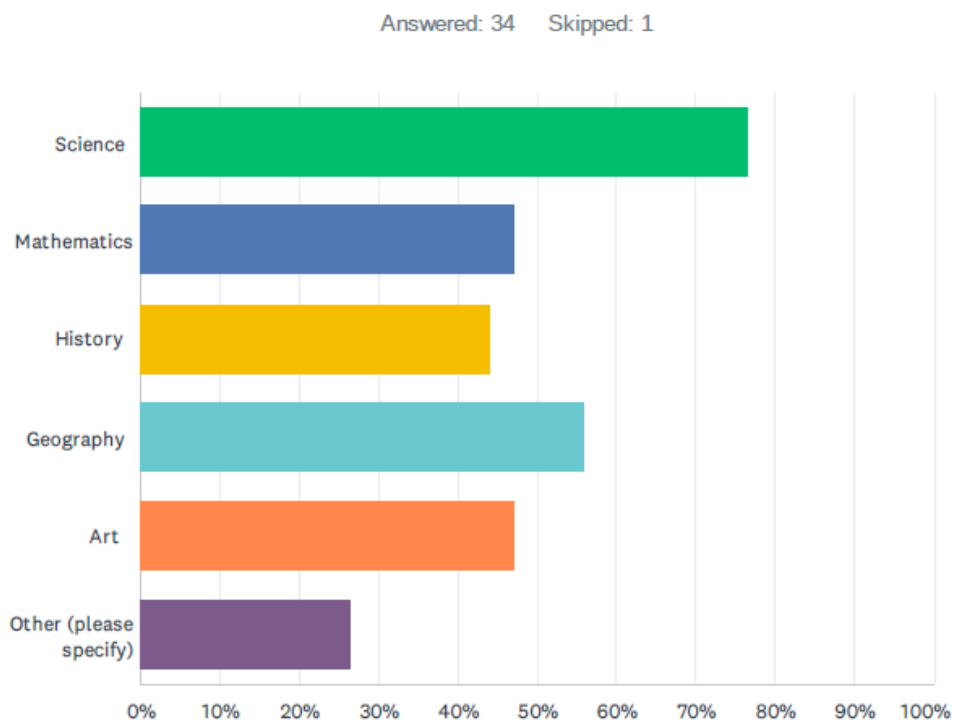
Support and Training Needs

To ensure the effective use of AR in classrooms, respondents identified several types of support they would need. Technical support was the most commonly requested, with 50% of respondents indicating its importance. Pedagogical training was also highly valued, with 29.41% of respondents seeking guidance on integrating AR into their teaching practices. The desire for a community of practice was noted by 14.71% of respondents, reflecting a need for peer support and shared learning experiences among educators adopting AR tools.

ANSWER CHOICES	RESPONSES	
Technical support	50.00%	17
Pedagogical training	29.41%	10
Community of practice	14.71%	5
Other (please specify)	5.88%	2
TOTAL		34

Interest in Training Sessions

Interest in training sessions on using AR tools was high, with 44.12% of respondents expressing a definite interest and 35.29% indicating they might be interested. This suggests a strong willingness among educators to invest time in learning how to effectively use AR in their classrooms, provided they receive adequate support and resources.

Preferred Training Methods

The respondents expressed a clear preference for online webinars (30.30%) and face-to-face workshops (36.36%) as their preferred methods of receiving training on AR tools. Self-paced online modules were favoured by 30.30% of respondents, while printed manuals were the least popular, with only 3.03% selecting this option. This highlights the importance of flexible and accessible training options that cater to different learning preferences among educators.

ANSWER CHOICES	RESPONSES	
Online webinars	30.30%	10
Face-to-face workshops	36.36%	12
Printed manuals	0.00%	0
Self-paced online modules	30.30%	10
Other (please specify)	3.03%	1
TOTAL		33

Additional Comments and Suggestions

In the open-ended section of the questionnaire, several respondents provided additional comments and suggestions for the development of the Multi-Access Classroom (MAC). While the specific content of these comments was not detailed in the data provided,

it is likely that they included valuable insights and recommendations for improving the design and implementation of AR tools in educational settings.

The Needs Analysis Questionnaire offers a comprehensive view of the current landscape of digital tool usage, educators' familiarity with Augmented Reality (AR), and the specific requirements for successful AR implementation in classrooms. The results reveal a promising interest in AR, particularly in subjects such as science and mathematics, where interactive and immersive experiences can enhance learning outcomes. However, the data also underscores the necessity of providing educators with adequate support and training to ensure the effective integration of AR into their teaching practices.

Recommendations

Targeted Training Programs: Given the strong interest in AR but limited experience among many educators, it is essential to develop targeted training programs. These programs should focus on both the technical and pedagogical aspects of AR, ensuring that educators not only understand how to use the technology but also how to integrate it effectively into their curriculum. Training should be tiered to accommodate different levels of familiarity, from beginners to advanced users.

- **Online Webinars and Self-Paced Modules**: Since online webinars and self-paced online modules were among the preferred training methods, these should be prioritised in the training offerings. Webinars can provide real-time interaction with experts, while self-paced modules allow educators to learn at their own convenience, catering to varying schedules and learning paces.
- **Face-to-Face Workshops**: For educators who prefer hands-on experience, face-to-face workshops should be offered. These workshops can be regionally organised to facilitate attendance and should focus on practical, classroom-based applications of AR, allowing educators to directly experiment with and apply AR tools in a controlled environment.

Enhanced Technical Support: The data indicates that technical support is a critical need for educators. To address this, a dedicated technical support team should be established to assist educators in setting up and troubleshooting AR tools. This could include a helpdesk,

live chat support, and detailed FAQ and troubleshooting guides. Additionally, a resource portal could be created, offering video tutorials, user manuals, and a repository of common issues and solutions.

Development of User-Friendly AR Tools: The AR tools provided to educators should prioritise ease of use, especially considering that many educators may not be technically inclined. Tools should feature intuitive interfaces, clear instructions, and seamless integration with existing classroom technologies and curricula. A focus on ease of navigation, as highlighted by 76.47% of respondents, will be crucial in ensuring that the tools are accessible to all educators, regardless of their technical proficiency.

Curriculum Integration and Customization: AR tools must be adaptable to various curricula and educational standards. Educators expressed a desire for tools that integrate seamlessly with existing teaching materials and methods. Therefore, AR developers should work closely with educators to understand their specific curricular needs and customise AR content accordingly. Offering templates and pre-designed AR experiences that align with common curricula could significantly ease the burden on educators and encourage wider adoption.

Fostering a Community of Practice: To support the ongoing professional development of educators using AR, it is recommended to establish a community of practice. This community could be an online platform where educators share experiences, resources, and best practices related to AR in the classroom. It could also facilitate peer-to-peer learning, mentoring, and collaborative projects. Regular virtual meet-ups, discussion forums, and case study exchanges could further strengthen this community, creating a supportive environment for continuous learning and innovation.

Pilot Programs and Feedback Loops: Implementing pilot programs in select schools or classrooms can provide valuable insights into the effectiveness of AR tools before wider rollout. These pilots should be closely monitored, and feedback from participating educators should be systematically collected and analysed. This feedback can then be used to refine and improve the AR tools and training programs. Moreover, successful case studies from pilot programs can be used to advocate for broader adoption across educational institutions.

Focus on Interdisciplinary Applications: While science and mathematics were identified as primary beneficiaries of AR, the potential for AR to enhance learning in other subjects such as history, geography, and art should not be overlooked. Interdisciplinary applications of AR can foster a more holistic learning experience, where students see the connections between different fields of knowledge. AR developers should, therefore, consider creating content that bridges multiple subjects, encouraging creative and critical thinking.

Certification and Recognition of Competency: As educators invest time and effort in learning and applying AR tools, it is important to recognize their commitment and proficiency. Offering certification upon completion of training programs can motivate educators to engage more deeply with AR tools. These certifications could also serve as professional development credits, adding value to educators' career progression.

Sustainability and Scalability Planning: Finally, the sustainability and scalability of AR initiatives should be planned from the outset. Schools and educational institutions need to consider the long-term maintenance of AR tools, including updates, technical support, and continued training for new staff. Partnerships with AR technology providers could be explored to ensure ongoing support and development. Additionally, scaling successful AR implementations from pilot programs to broader use across schools and districts should be carefully managed to maintain quality and effectiveness.

The successful integration of AR into classrooms holds significant promise for enhancing educational outcomes across a range of subjects. However, this potential can only be realised through careful planning, substantial support, and ongoing professional development for educators. By addressing the needs identified in the Needs Analysis Questionnaire—through targeted training, user-friendly tools, robust technical support, and a strong community of practice—educational institutions can empower teachers to effectively utilise AR, enriching the learning experiences of their students. Implementing these recommendations will help ensure that AR tools are not only adopted but are used to their fullest potential in transforming education.