

ARISE: AI and AR for inclusive health education

ARISE: KI und AR für eine inklusive Bildung im Gesundheitswesen

Abstract

The ARISE project (AI & AR for Inclusive Health Education) addresses gender disparities in science, technology, engineering, and mathematics (STEM) and digital healthcare by equipping women in underserved areas with AI-driven and AR-based digital health skills. The initiative develops five immersive VR/AR training modules, an open-access Moodle platform, and a Manifesto for Women in Digital Medicine and STEM to foster leadership and inclusion. ARISE aims to enhance AI literacy, telemedicine competencies, and strategic thinking through detailed technical integration of AI-driven adaptive learning pathways and AR-based immersive clinical simulations among at least 100 women across Europe through a comprehensive needs assessment, adaptive learning, and gamified clinical simulations. This paper presents the project concept, rationale, and implementation plan, discussing the integration of AI and AR on health education and outlining anticipated outcomes as the project enters its implementation phase.

Keywords: AI-driven learning, augmented reality, gender inclusion, digital health education

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Zusammenfassung

Das ARISE-Projekt (AI & AR for Inclusive Health Education) befasst sich mit geschlechtsspezifischen Ungleichheiten in den Bereichen Mathematik, Informatik, Naturwissenschaften und Technik (MINT) und digitale Gesundheitsversorgung. Dazu werden Frauen in unterversorgten Gebieten mithilfe von KI-gestützten und AR-basierten digitalen Anwendungen in ihrer Gesundheitskompetenz gestärkt. Die Initiative entwickelt fünf immersive VR/AR-Schulungsmodule, eine frei zugängliche Moodle-Plattform und ein Manifest für Frauen in der digitalen Medizin und MINT, um Führungsqualitäten und Inklusion zu fördern. ARISE zielt darauf ab, die KI-Kompetenz, Telemedizin-Kompetenzen und das strategische Denken durch eine detaillierte technische Integration von KI-gesteuerten adaptiven Lernpfaden und AR-basierten immersiven klinischen Simulationen bei mindestens 100 Frauen in ganz Europa durch eine umfassende Bedarfsanalyse, adaptives Lernen und gamifizierte klinische Simulationen zu verbessern. Dieser Artikel stellt das Projektkonzept, die Begründung und den Umsetzungsplan vor, diskutiert die Integration von KI und AR in Bildungsmaßnahmen und skizziert die erwarteten Ergebnisse vor dem Hintergrund der beginnenden Umsetzungsphase.

Schlüsselwörter: KI-gestütztes Lernen, Augmented Reality, Geschlechterinklusion, digitale Gesundheitsausbildung

Introduction

Healthcare systems increasingly rely on digital technologies, yet gender gaps persist in STEM education and leadership, especially in rural and underserved areas. Women remain underrepresented in digital health fields, comprising fewer than 30% of leadership positions and only 22% of AI professionals globally. The project responds to this challenge by integrating AI-driven adaptive learning, immersive AR/VR clinical simulations, and leadership training into an inclusive education framework. Recent studies further underscore the potential of AI-AR convergence in health education, including clinical simulation training [1] and student-centred applications in nursing [2], highlighting the timeliness of ARISE.

Aligned with Erasmus+ priorities [3], ARISE aims to foster digital readiness, gender equity, and sustainable, scalable models for inclusive digital health education. Given that the project is in its early implementation phase at the time of this presentation, this paper emphasises the project's design, state of the art, and expected contributions. Beyond practical application, ARISE provides a real-world testbed to assess how gender-responsive, AI- and AR-supported learning models can improve engagement and retention in digital health education, particularly in low-resource or rural contexts.

Recent advances in AI and AR have significantly transformed medical education and healthcare delivery, although comparative analysis with other digital health education initiatives shows ARISE's distinct advantage in gender-focused inclusive approaches [4]. AI applications in education include adaptive learning systems, intelligent tutoring, and automated assessment tools [5]. Augmented reality enhances experiential learning through interactive simulations and visualisation of complex anatomical and clinical processes [6]. However, most implementations remain localised to well-resourced institutions, with limited accessibility for marginalised populations.

Studies have identified barriers such as cost, technological infrastructure, and pedagogical integration challenges [7]. Moreover, few initiatives explicitly address gender disparities in access to digital health education or leadership pathways in STEM. ARISE builds on these insights by combining AI-driven personalisation with AR-based clinical simulations in a scalable, open-access model targeting underserved women.

Methods

ARISE employs a multi-phase methodology across five work packages (WP), a modular format typical in Erasmus+ projects, each targeting a specific operational domain. WP1 covers project management and quality assurance. A needs assessment (WP2) identifies educational barriers for women in digital health. The stakeholder consultations include structured interviews and focus groups with NGOs, educators, and women in underserved

areas to identify key barriers to access, motivation, and technological familiarity.

Based on these insights, the project develops five VR/AR-based training modules (WP3) covering telemedicine, AI-assisted diagnostics, electronic health records, digital leadership, and ethical AI governance. Digital skills and meta-abilities (WP4) are fostered through workshops, mentorships, and gamified learning pathways.

A Moodle-based platform was chosen for its flexibility, accessibility, and cost-effectiveness for open-access deployment. Self-paced learning was adopted to accommodate women's varied schedules, particularly those balancing caregiving responsibilities, and to foster autonomy in acquiring digital skills.

Dissemination activities (WP5) include policy briefs, stakeholder events, and the Manifesto for Women in Digital Medicine and STEM.

Results

At the time of writing, ARISE has completed preparatory activities and is commencing the needs assessment phase. Preliminary stakeholder consultations have identified key barriers, including a lack of digital devices, limited internet connectivity, and socio-cultural biases limiting women's participation in STEM. Although technical development is ongoing, the initial needs assessment has already informed scalable training approaches adaptable to other EU regions.

Anticipated results include five interactive VR/AR training modules, a functional open-access Moodle platform, and engagement of over 500 stakeholders through advocacy and dissemination activities. The project aims to train at least 100 women in AI-driven healthcare competencies and to position the Manifesto as a policy tool for advancing gender-inclusive digital health education.

Discussion and conclusions

ARISE represents an innovative approach to bridging gender and digital divides in healthcare education by integrating AI, AR/VR, and leadership development. The inclusion of adaptive learning paths and immersive simulations aligns with current evidence on effective digital pedagogy [8], [9].

By embedding a policy advocacy component through the Manifesto, ARISE extends its impact beyond individual learners to institutional and policy levels. While results are preliminary, the project's design addresses documented gaps in accessibility, inclusivity, and leadership in digital health education [10]. Sustainability is ensured through the institutional integration of training modules and continued platform access post-project.

As the project moves into implementation, ongoing evaluation and stakeholder engagement will be critical for refining approaches and scaling impact. ARISE contributes to building a digitally literate, inclusive, and resilient

healthcare workforce. The project's design ensures replicability across similar socio-economic contexts, aligning with long-term digital transition goals in European healthcare education.

Notes

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Competing interests

The author declares that he has no competing interests.

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