Concept Note: EduGenAI Connect

Immersive AI/XR Platform for Inclusive Learning in Africa

For Horizon Europe Call: HORIZON-CL4-2025-04-HUMAN-08 "GenAI for Africa"

1. Executive Summary

The "EduGenAI Connect" project proposes a transformative initiative aimed at addressing the dual educational and digital challenge in Africa, by harnessing the potential of Generative Artificial Intelligence (GenAI) and Extended Reality (XR). This project will develop and adapt innovative GenAI solutions to create personalized learning pathways, multilingual educational content (including 3D simulations) and immersive virtual tutors in AR/VR. These digital skills enhancement tools are specifically designed for primary and secondary school students, higher education students, and teachers, with particular attention to rural communities and women in Africa. The approach will be anchored in co-creation, technological adaptation to local realities (low bandwidth, mobile-first access) and strong ethical commitment, ensuring measurable and sustainable socio-economic impact.

2. Context and Problem Statement

Africa faces a major dual educational and digital challenge. Connectivity infrastructures remain highly unequal: according to UNESCO and the World Bank, only 36% of the African population had access to high-speed Internet in 2022, with strong rural disparities. Educational systems are under severe pressure (conflicts, climate change, energy deficit): several tens of millions of children risk having their schooling interrupted. The statistics are alarming. The digital and educational divide is widening, aggravated by social and gender inequalities.

These data highlight the urgency of educational innovations adapted to African contexts. The project proposes to respond through an innovative pedagogical platform based on generative AI and extended reality, to compensate for the lack of pedagogical resources, support teachers and personalize learning. By building on the progressive digitization of African educational systems and the expansion of mobile access, the objective is to make learning more interactive, engaging and inclusive, while respecting local realities (languages, cultures, technical constraints).

3. Proposed Innovation

The "EduGenAI Connect" project will propose a mobile-first learning platform based on generative AI, integrating immersive virtual tutors in extended reality. This pedagogical innovation aims to offer personalized and motivating learning through:

- **Virtual tutors in XR**: Intelligent educational avatars will guide learners and tutors in an immersive environment, answering questions and adapting exercises in real time. Generative AI enables personalized learning pathways and provides on-demand tutoring, even outside traditional classrooms. Particular attention will be paid to the gender dimension to ensure equitable and relevant interactions.
- **Multilingual and co-created content**: The platform will automatically generate pedagogical materials (texts, exercises, videos, 3D simulations, etc.) adapted to school curricula and local languages. Through co-creation in Living Labs, this content will be culturally relevant and validated by teachers and local communities.
- **Mobile-first and low-bandwidth architecture**: Designed for countries with low bandwidth, the platform will prioritize access via smartphone and tablet, with a lightweight interface and partial offline mode. The objective is to ensure smooth usage in rural areas.
- **AI training and responsible digital usage**: The platform will integrate educational modules on AI basics and digital best practices (digital citizenship, security, ethics). These modules aim to strengthen the digital skills of learners and teachers.

This ensemble builds on AI's capacity to create an ecosystem of transformative solutions to African societal challenges. In particular, GenAI can revolutionize digital education by producing personalized learning experiences, automated tutors and content adapted to the local environment. This project will combine these technological advances to propose an accessible and inclusive education model, especially where resources are scarce.

4. Methodological Approach

Implementation will be based on a North-South participatory co-development approach. The AUF will coordinate a consortium associating universities, research laboratories, NGOs, technology companies and educational authorities to:

- **Co-creation in Living Labs**: Educational Living Labs will be established in each pilot African country, bringing together students, teachers, local start-ups and experts. In these open innovation spaces, users will participate in the design and testing of content and tools, to ensure adequacy to real needs and local appropriation of solutions. Furthermore, to guarantee socio-economic impact of the project, the Living Labs will host incubation programs for young local startups in the AI field following a call for applications. These Living Labs will also play the role of scientific incubator hosting young researchers within the framework of cross-mobility researchers/young talents. The Living Labs will be based on a triptych structuring the activities they will host: Innovation, entrepreneurship and applied research.
- **Local capacity building**: Training of teachers (initial and continuing) in digital tools and AI integration in the classroom, technical training of local developers in generative AI, and awareness workshops for students. The project will particularly target rural areas, filling the gap in access to training and equipment.
- **Linguistic and cultural adaptation**: AI models will be trained on African language corpora and adapted to local pedagogical frameworks. This linguistic approach ensures inclusivity while taking into account cultural variations.
- **Robust technical architecture**: The software infrastructure will be designed in "mobile-first/low-bandwidth" mode (cache storage, data compression, lightweight APIs, etc.) to ensure access even with unstable connection. AI will operate in mixed mode (cloud + edge computing if possible) to minimize latency.
- **Applied research**: The applied research component as well as the valorization of this research will find its full place in our methodology: We ensure that each innovation implemented has its impact evaluated by a team of North/South researchers. Among the research themes (PhD thesis or Post-Doc) we will mention: Study of usage according to gender, location, mother tongue, Effects of algorithmic personalization on educational success, Impact of XR virtual tutors on student learning (results, motivation), etc. The results of this research work will be published in international journals in the field of AI and/or Education.
- **Multi-country piloting and evaluation**: Implementation will be based on a North-South participatory co-development approach. The Agence universitaire de la Francophonie (AUF), a network of more than 1,000 member universities, will coordinate a consortium associating universities, research laboratories, NGOs, technology companies and educational authorities. We opt for an approach going from a pilot system to multi-site dissemination: Deployment of a pilot prototype, then extension to other countries with local partners as co-developers. Quantitative and qualitative impact indicators will be defined from the beginning (platform usage rate, digital skills progression, evaluation results, proportion of female users, etc.), allowing measurement of digital divide reduction and inclusion of disadvantaged groups.
- **Ethical and responsible AI by design**: Ethical considerations will be integrated at each stage of the project. We will develop frameworks to identify and mitigate potential biases in GenAI models, particularly those related to gender and culture. Transparency, data protection and accountability will be guiding principles, ensuring that technology serves human well-being without causing harm. Similarly, anonymized data will be stored on secure servers. The establishment of an ethics and responsible governance committee will be the guarantor of the project's ethical compliance, prevent risks related to GenAI usage, and guarantee cultural and social inclusivity.

5. Expected Impacts

The project aims for strong and measurable social and educational impacts:

- **Strengthening digital and pedagogical skills**: Learners will develop autonomy and mastery of digital tools through interactive and personalized learning. Teachers will be equipped to integrate AI and XR into their practices.
- **Reducing the digital divide**: Expanded access to quality digital educational resources will help reduce the gap between urban and rural areas and the gender gap.
- **Sustainable pedagogical innovation**: The use of generative AI and XR will create innovative and playful teaching methods. These methods will improve academic results, as shown by pilot initiatives (for example the use of virtual tutors in DRC, which has already helped 10,000 students in mathematics).
- **Strengthened R&I ecosystem**: Through the creation of North-South collaborations, the project will boost local research and innovation capacities. It will foster the emergence of African EdTech start-ups and consolidate research networks dedicated to educational technologies. It fully aligns with the priorities of the AU-EU Innovation Agenda and Horizon Europe, which aim to strengthen R&I ecosystems, encourage young scientists and develop sustainable solutions addressing global challenges.

6. Partnerships and Strategic Coherence

We invite European and African institutional and operational partners to join this consortium. Ideally, the project will associate:

- Educational and research institutions (universities, laboratories) specialized in education, digital technologies and AI.
- Technology companies and EdTech start-ups interested in developing multilingual AI/XR content.
- Non-governmental organizations and educational development actors (NGOs, teacher associations) involved in rural education.
- Public authorities (Ministries of Education, training agencies) ready to co-construct pilot programs.

By fostering co-development, these partnerships will ensure mutual skills transfer and guarantee that the platform responds to local needs while integrating European technological excellence. The project will offer partners the opportunity to participate in an initiative with strong societal impact, focused on digital and industrial technologies for human purposes, promoting inclusive, ethical and partnership-based AI.

In summary, this GenAI-Education project for Africa is distinguished by its innovative technological approach, local participatory approach and societal ambition (reducing the digital divide, inclusion of girls, capacity building). It represents an open innovation platform where Europe and Africa co-construct sustainable educational solutions adapted to African realities together. Future European and African partners will find a solid framework to unite their expertise and tackle critical challenges together.

7. Estimated Project Budget

2 Million Euros.