Generation AI
Nurturing Future Innovators

FAST DISCOVERING THE FUTURE

ABOUT GENERATION AI: HIGH SCHOOL PROJECT

The Generation AI High School Project is the first stage of the Generation AI Program, aimed at nurturing future AI innovators. Developed by the Foundation for Armenian Science and Technology (FAST) in collaboration with the Ministry of Education, Science, Culture, and Sports, this national initiative is currently in its pilot phase, involving **15 schools and impacting about 600 students, along with about 61 teachers and specialists from 7 regions of Armenia.**

Fully **integrated into Armenia's public education system**, the program is accessible to all students free of charge. The only selection criteria are the students' motivation and their foundational math knowledge from previous studies. Participants receive state-recognized certificates and credits that are transferable to the next level of education.

The Generation AI High School Project offers a **comprehensive, three-year curriculum[1] that covers Advanced Algebra, Python programming, and Advanced AI topics** such as Machine Learning and Deep Learning. The program includes over **760 formal academic hours,** with an additional 500 hours dedicated to project-based learning clubs, skill development, and career guidance. These subjects account for about half of the student's total learning, with approximately five hours per week allocated to each topic. A strong foundation in mathematics is a key focus throughout the program.

[1] *The Generation AI curriculum is developed and benchmarked with leading international frameworks, including the UNESCO AI Competency Framework, AI4K12, China AI National Program, and the US Pilot in Georgia.

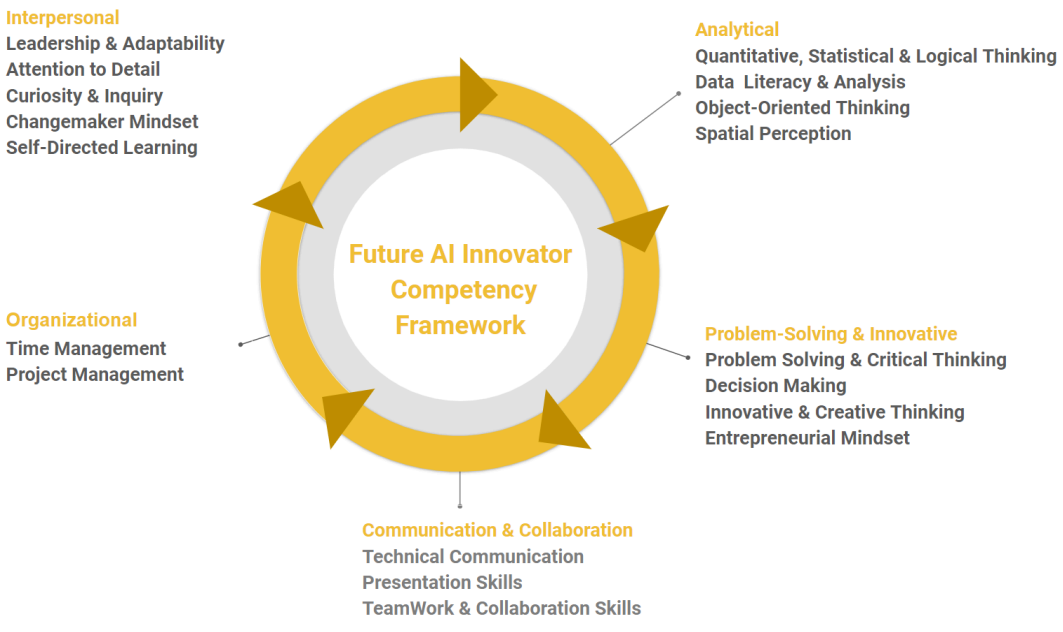
Picture 1: Generation AI High School Courses

Generation AI Curriculum Matrix =

10th Grade	11th Grade	12th Grade	Additional Clubs
Advanced Algebra	**Advanced Algebra**	**Advanced Algebra**	**Applications of Algebra, Python and AI in real-life**
Computer Science Basic Level	**Computer Science** Advanced Level	**Deep Learning** Advanced Level	**English**
Machine Learning Mid Level	**ML & Deep Learning** Advanced Level	**AI Applications** Project Implementation and Presentation	**Skills Development & Career Guidance**
306 Academic Hours	**324** Academic Hours	**134** Academic Hours	**500** Academic Hours

The program emphasizes a **Project-Based Learning approach** in all core subjects, enabling students to apply their theoretical knowledge in practical, real-world contexts. Over the three years, students undertake projects across all subjects. Beginning in the **second semester of 10th grade, students dive into advanced AI topics taught in a hybrid format with both online and offline components delivered by specialized instructors.** Upon graduation, **students complete a capstone project** that showcases their AI knowledge and skills and collaborate with industry partners on a wide range of topics, ensuring their **learning extends beyond any single industry.** In addition to technical skills, the curriculum fosters **soft and life skills development, career guidance, and English language enhancement**, preparing students for long-term success as AI innovators.

Picture 2: Generation AI High School Student Competency Framework



One of the core objectives of the program is to develop the next generation of AI innovators. Students are equipped with the skills and **knowledge to pursue careers as scientists, startup founders, and leaders in AI-driven fields, rather than focusing solely on industry-specific roles.** The program is also **a driver of innovation within schools,** transforming teaching practices to meet the evolving demands of the future workforce. As part of this broader effort, the program **implements long-term teacher training and mentorship, works closely with school directors, develops hybrid teaching methodologies, and integrates student-centered learning approaches into classrooms.**

In the coming years, the program will **expand to up to 45 schools** in strategic locations, broadening its **reach to more than 85% of students nationwide**. This expansion will ensure greater accessibility to AI education for a larger portion of the student population.

At the same time**, the second stage of the Generation AI program is being developed,** focusing on an undergraduate program to ensure the continuation of AI education and the advancement of skills. The program emphasizes the importance of continuous, profound learning, prioritizing long-term education over short-term industry preparation. Through this approach, students gain deep knowledge and skills in AI, STEM, and related fields, positioning them for further academic and professional development.

PROBLEM STATEMENT

With the current economic growth rate, Armenia will require more than 500 years to reach the level of the current top 10 innovative countries. Therefore, Armenia needs leapfrogging **(e.g., 16.7% annual growth rate for the next 20 years)**. The unfavorable geopolitical situation and scarce natural resources mean Armenia cannot leapfrog with traditional economic means.

To address this, Armenia must invest in human capital, including education, healthcare, and the social sphere, which accounts for a significant portion of potential capital shares. Currently, Armenia's average labor productivity (GDP per hour worked) is $19.8, far below developed countries' level of $94. Public financing of education is also low at 2.14% of GDP (in 2021), well below the average of upper-middle-income countries (3.9%).

Furthermore, only a small portion of public expenditures are directed towards higher education, contrasting with the higher rates seen in OECD and developed countries. The human capital index (HCI) indicates that a child born in Armenia today will be only 58% as productive as they could have been with full access to health and education services. Therefore, Armenia must significantly

increase its investment in education to enhance its human capital, leading to long-term economic growth. Additionally, instead of spreading resources thinly across multiple sectors, directing efforts towards niche areas where Armenia has a competitive advantage can yield better outcomes.

Armenia has a strong global comparative advantage in natural sciences, mathematics, and statistics (NSMS). The following table represents the number of tertiary graduates per 1,000 individuals:

	Armenia	**Global Average**
ICT-related courses graduates	0.38	0.32
NSMS graduates	0.6	0.36

At the same time, until recently, there have been few commercial opportunities for mathematicians in Armenia, but AI research has created high demand for mathematicians globally. Along with that, Armenia is facing a **shortage of AI-related graduates**. The causes are the lack of an education pipeline and ecosystem, hindering its competitiveness in the global market.

Notably, Armenia **does not have a dedicated Ph.D. program in AI.** Instead, doctoral degrees in AI are obtained through AI-related programs. In the field of computer science, the percentage of graduates specializing in AI/ML is 6.7% for bachelor's degrees and 8.4% for master's degrees in Armenia. This proportion is lower compared to the global average of 22.8% for Ph.D. programs in AI.

Armenia's AI education is hindered by a **lack of strong foundational education in mathematics and computer science at the school level**, with approximately a quarter of students failing the state graduation math exams. Furthermore, there is a **concentration of exemplary practices in only a few specialized schools located in Yerevan**. Only **5 Universities offer AI-related degrees** (the share of AI programs in the total number of programs is 0.84%, and AI-related programs (including math and computer science) is about 9% according to the Ministry of Education, Science, Culture and Sports of RA). However, the number of students entering AI programs remains low. Additionally, **Armenia's academic track record in AI publications is considered poor, with only 76 publications in AI** subject categories from 1996 to 2021, placing Armenia on 116th position out of 195 countries according to the Scimago Journal and Country Ranking. Moreover, the thriving **IT sector further exacerbates the issue by recruiting top mathematical talents directly from high school,** leading to a decline in university enrollment and discouraging further education.

To enhance global competitiveness, Armenia needs to prioritize AI development from the secondary education level, improve math and computer science education, popularize AI careers, especially in research and innovation, and establish industry-connected education pathways.

SOLUTION

FAST has designed the “Generation AI” program to **create an educational and career pipeline of AI researchers and innovators.** It aims to develop the critical mass equipped with the knowledge and skills critical to succeed in the AI-driven reality and support the country’s global competitiveness.

The interventions are planned for all levels of the education system:

- **Generation AI: High School Project** - The main program starts from the high school level, and some interventions are planned for middle school in regard to math and prof orientation starting from the 7th-8th grades.
- **Generation AI: BA Project** - Revision of the current programs and the development of the new courses are planned in several universities to ensure the pipeline and diversification of the specializations. Focus on project-based learning during the first years of study and involvement in local and international research projects as Intern Researcher.
- **Generation AI: MA Project -** Revision of the current program, development of the new ones, concentration on research projects. Opportunities for involvement in local and international research projects as Junior Researchers.
- **Generation AI: Doctorate Project** - new program development and creation of possibilities for doing industrial R&D.

Designed in partnership with the Ministry of Education, Science, Culture, and Sports of the Republic of Armenia, as well as with active involvement of NGOs, academia, and industry professionals, Generation AI’s integration into the public education system will ensure future sustainability and be a step toward systemic changes in education with long-term benefit for Armenia’s research and technological capacity.

The program will serve as a model for robust public-private partnerships and allow us to introduce best educational practices and international standards to Armenia. The first phase of the program involves a pilot program in high schools.

OPPORTUNITY

AI presents a transformative opportunity in today's society, with a projected global market value of $459.3 billion by 2030. It is a platform technology that can be applied across various industries, offering resilience during crises. According to McKinsey Global Institute, AI adoption is expected to grow, with around 70% of companies adopting AI technology by 2030, potentially delivering an additional economic output of $13 trillion and increasing global GDP by 1.2% annually.

At the same time, the talent shortage worldwide has been consistently highlighted as a vital issue for AI expansion. Since 2016, the leading countries competing in the AI market have already designed AI programs to educate and sustain the best and brightest AI talents from an early age. China has

been one of the best cases of centrally integrating and instituting AI education in K-12 education since 2017. Regardless of those efforts, the global shortage still remains.

In this context, Armenia has an opportunity to participate in the development of globally competitive AI researchers and engineers. Armenia has a strong global comparative advantage in mathematics and natural sciences — even more so than in ICT. Armenia's graduates from ICT-related courses and natural sciences, mathematics, and statistics (NSMS) surpass the global averages and outperform many of its regional competitors.