

**TERMS OF REFERENCE
FOR TEACHER TRAINING AND MENTORSHIP PROGRAM
DEVELOPMENT AND IMPLEMENTATION**

Project Title: Generation AI High School Project: Teacher Training and Mentorship Program

Place: Yerevan and Regions, Armenia

Format of Trainings: In-person (online solutions are allowed)

Time frame: July 2023 - June 2024

BACKGROUND INFORMATION

The Foundation for Armenian Science and Technology (FAST) is a non-profit organization dedicated to fostering innovation and supporting scientists, technologists, and innovators in Armenia and beyond. FAST aims to empower individuals to develop cutting-edge solutions with global competitiveness and architect platforms for comprehensive training and knowledge transfer in the fields of Education, Research, and Commercialization.

One of the initiatives under FAST's Education pillar is the Generation AI program, which seeks to establish an educational and career pipeline starting from high school. The initial phase of the program called the Generation AI High School Project aims to:

- provide prerequisite competencies in advanced mathematics and computer science needed for learning AI.
- increase student literacy and motivation towards AI and STEM research & innovator careers.
- deliver differentiated AI education for high school students.

The pilot stage of the high school project will commence in September 2023 and involve approximately 10 high schools (public and private that have advanced math-based tracks) in Yerevan and regions of Armenia.

The program is being implemented in collaboration with the Ministry of Education, Science, Culture, and Sports of the Republic of Armenia, and it actively engages NGOs, academia, and industry professionals.

The project comprises several components, implemented in partnership with knowledge experts and organizations. These components include:

1. Curriculum and resources development for advanced math (algebra), computer science (Python programming), and artificial intelligence,
2. Capacity building program including specialist involvement from the industry, training and mentorship programs for schoolteachers and industry professionals,
3. Enhancement of school computer science labs,
4. Extracurricular activities including career guidance programs and English language enhancement programs.

Component 1 is in the active preparation stage, with the curricula for computer science and artificial intelligence created and approved by the MoESCS. A methodological guideline for math teachers, emphasizing a student-oriented approach and active learning strategies, has also been developed by FAST, taking into account the state standards for advanced algebra in high schools. Additionally, teaching and learning resources for Python programming have been developed and published on a platform in partnership with the Profound Academy.

Other activities, including those related to Component 2, which involve the engagement of industry specialists, capacity building, and the implementation of a mentorship program for schoolteachers and industry professionals, are still in progress. By the first week of July, the list of schools will be made available, and the involvement of math teachers will be defined. Furthermore, it is projected that by the start of July 2023, industry specialists for teaching Python and ML will be recruited by FAST.

SCOPE OF WORK

To ensure the effective delivery of the educational program, FAST invites eligible organizations and consortia to apply for the development and implementation of the training and mentorship program for the 2023-2024 academic year for school math teachers and industry specialists who are going to teach within the Generation AI High School project in 10 public high schools located in Yerevan and regions.

Objectives of the Teacher Training and Mentorship Program:

- Enhance the subject knowledge, pedagogical skills, and ability of public high school math and CS teachers to support students effectively.
- Enhance the pedagogical skills and ability of industry (non-school teachers) specialists to support students effectively.
- With 1-year long mentorship program foster a community of reflective practitioners engaged in ongoing professional development and collaboration.

- Prepare teachers to meet the related requirements for teacher attestation and fulfill the necessary credits for certification.
- Prepare teachers to act as future trainers according to state requirements.

The Partner will carry out all aspects involved in the implementation of these training and mentorship programs (that is, development of training and mentorship program materials, recruitment of trainers, organization of logistics and communications, monitoring and assessments) and will be responsible for quality control of all activities and the data, and the delivery of work meeting the highest standards and project's objectives.

KEY SERVICES

PARTNER'S ROLE

1. Developing a teacher training and mentorship program along with training materials and assessments aligned with the aims and requirements of the project (see Appendix I) and ensuring compliance with [teacher attestation and grading requirements](#) to deliver the necessary credits and qualifications.
2. Organizing and providing training sessions for the following target group
 - a. About 20-25 school advanced math teachers (2-3 from approximately IO schools).
 - b. About 5-10 specialists (from industry or academia) selected by FAST acting as supervisors and will be delivering specialized subjects (Python programming, AI), and about 10 computer science teachers from schools (assisting the supervisors in the classroom).
3. Managing logistics and communications related to the training and mentorship programs, including scheduling sessions, coordinating venues, and disseminating relevant information to participants.
4. Implementing a year-long mentorship program to provide ongoing support and guidance to participants through regular check-ins, feedback sessions, and virtual or in-person consultations, designing and facilitating workshops and seminars to foster collaboration and professional development among participants.
5. Monitoring and evaluating the effectiveness of the training and mentorship programs through pre and post-assessments, surveys from participants, training sessions and trainer performance data analysis according to the requirements of FAST. Conducting quality control measures to ensure the delivery of work and activities meet the highest standards and project objectives. Presenting evaluation results to FAST in the format provided by the organization and making adjustments based on the feedback to assure the quality of the provided services.
6. Providing quarterly progress and final reports to FAST, highlighting achievements, challenges, lessons learned, and recommendations for improvement (according to FAST report forms).

FAST'S ROLE

1. Recruiting and/or nominating training participants, identifying eligible math teachers, computer science teachers, and specialists to participate in the training and mentorship program.
2. Establishing mechanisms to motivate and encourage participation in the training and mentorship program, providing incentives to participants for their active involvement and engagement.
3. Ensuring training content and resources developed are in line with the program's aims and objectives. Reviewing and providing feedback on training materials, assessments, and other program resources to ensure alignment with project requirements.
4. Assessing the execution excellence and impact of the training and mentorship program by reviewing the reports provided by the training organization to guarantee the superior quality and optimal effectiveness of the services rendered and giving recommendations for improvement.

EXPECTED DELIVERABLES AND TIMELINE

The cooperation between the FAST and Partner will commence in July 2023 and continue for a period of one year. Specific timelines for each deliverable will be agreed upon in a separate agreement through mutual discussion and coordination.

Deliverable	Description	Timeframe
Need Assessment Report	The gathering of direct questionnaires and collection of results from stakeholders, state, and partner organizations before the design of a capacity-building program aligned with participants' development needs.	July 2023
Training Planning and Program	<p>A comprehensive program that describes the training organization, coordination, implementation, monitoring, and evaluation of the trainings.</p> <p>It should include detailed information such as suggested activities, training methodology, timeline, budget, sessions' outline, list of trainers, assessment tools, and evaluation methods.</p> <p>This program should be aligned with the objectives and curriculum requirements of the Generation AI High School project and purpose (see Appendix I).</p>	July-August, 2023
Training Materials	The training materials package for each session should include interactive and engaging activities for various topics related	July 2023 - May 2024

	<p>to math and specialized subjects education, pedagogy, curriculum implementation, and assessment strategies.</p> <p>These materials should be aligned with the mutually agreed training and mentoring planning and program, Generation AI High School project's objectives, and curriculum requirements.</p> <p>Additionally, the training materials package should incorporate assessment tools and assignments aimed at evaluating participants' subject knowledge, pedagogical skills, and application of learned concepts.</p>	(Relevant materials for the session should be provided 10 days before the sessions)
Training Sessions	<p>Organized and facilitated training sessions conducted by trainers with relevant qualifications (subject matter experts).</p> <p>Documentation of the training sessions, including session agendas, presentations, handouts, and any supplementary materials developed within the program's scope and used during the sessions.</p>	August 2023 - June 2024
Mentorship Program	<p>The mentorship program, including the session details, assessment, and monitoring tools.</p> <p>Documentation of participants' progress, achievements, and areas of growth throughout the program.</p>	September 2023 - June 2024
Progress Monitoring and Final Assessment Results	The monitoring results of the teacher progress and the final assessment of teachers required for the accreditation.	August 2023 - June 2024
Teacher Accreditation and Certification	Documentation or verification of participants' completion of the required credits and certificates.	June 2024
Progress and Final Reports	Quarterly progress and final reports highlighting the achievements, challenges, and recommendations for improvement of the training and mentorship program (according to the template provided by FAST)	June 2024

WHO CAN APPLY

FAST invites eligible organizations and consortia to apply for the development and implementation of the training and mentorship program for the 2023-2024 academic year for

more than 30 school math and CS teachers and industry specialists who meet the following qualification and criteria:

1. Experience in education training and mentorship:

The candidate should have a demonstrated history of successfully designing and delivering professional development programs or training initiatives within the education sector. Previous experience in developing training and mentorship programs specifically for math, computer science teachers, and/or industry specialists for specialized subjects would be beneficial. Additionally, a strong understanding of mathematics and computer science education in Armenia, including teachers' needs and curriculum standards, is desired.

2. Expertise in pedagogy and instructional methods:

The ideal candidate should possess expertise in pedagogy and instructional methods relevant to math, computer science education, and program objectives. This includes but is not limited to familiarity with student-centered approaches, differentiation strategies, assessment techniques tailored to math and computer science instruction, and knowledge of blended learning, technology integration, and interactive teaching methodologies.

3. An accredited organization by MoESCS to provide teacher credits: (in case of absence, should be obtained before the start of trainings) The candidate should be certified to provide a teacher accreditation program.

4. Relevant team:

The candidate should have access to a knowledgeable expert team, certified trainers, and mentors who can provide relevant support and guidance throughout the program.

5. Budget and cost-effectiveness:

The proposed budget should be considered, taking into account the candidate's pricing structure and ability to provide value for money and cost-effective training and mentorship services without compromising on quality.

6. Collaboration and partnership:

The candidate should have a history of effective collaboration with key stakeholders, including education authorities, school administrators, and the project team, to ensure a cohesive and coordinated approach to program implementation.

APPLICATION PROCESS

Organizations can apply both separately or in consortium with other organizations. Also, applications for training and mentorship programs for separate target groups (math teachers or Python instructors and computer science teachers) can be admitted as well.

The applicants can ask for online meetings before the final submission of the proposals and documents to discuss the details of the proposal and Generation AI High School Project aims. The request for the meeting can be sent to this email (education@fast.foundation).

The selection process will be predicated upon the alignment of the provided technical proposal with the objectives of FAST, in conjunction with the training organization's extensive experience and expertise, as well as a competitive budget.

After the initial screening of the proposals, the shortlisted candidates will be invited for meetings to discuss the details of the possible cooperation. **The application deadline is July 7, 2023.**

PROPOSAL AND DOCUMENTATION

The organization should provide a **technical proposal** that includes:

1. **Introduction:** a short overview of your organization (please attach the extract from the State Register and the Charter), its experience (attach contracts certifying experience, handover acceptance acts, references from partners), and organized trainings, as well as partnership history. Attach to the proposal a plan and training materials for one topic from previous experience.

2. **Scope** that presents:

1. Methodology: Explain the training and mentorship approach and methodology that will be employed for each target group (within 1 page).
2. Training plan outline: Break down the training and mentorship program into phases, present the topics and learning outcomes along with their timeline, duration, and sequencing based on the Generation AI High School project's objectives and [state standards for teacher trainings](#).
3. Team: the list of trainers and mentors. Submit the CVs and documents certifying the qualifications of the specialists included in the list.
4. Resources: list of resources including facilities, equipment, and any additional requirements. If necessary, the Foundation can request additional information.
5. Assessment and evaluation: Describe the assessment and evaluation tools for the participants' performance, learning outcomes, and training and mentorship program (within 1 page).

3. **Budget and Timeline**: Provide a detailed budget and timeline for the training and mentorship program development and implementation. The budget structure should be aligned with this [form](#) developed by FAST and the timeline should be presented in a Gantt chart format.

4. **Risks and Mitigation**: Identify potential risks or challenges that may impact the training and propose strategies to mitigate these risks and ensure smooth execution.

In line with the technical proposal attach the **certification** or proof (if applicable) to provide a teacher accreditation program.

Requirements for Math Teacher Training and Mentorship Program

Content-related requirements

- The program should have the following components:
 - Subject Knowledge training
 - Pedagogical methodological training
 - Mentorship program
- The subject and methodological training should be based on the topics defined by the [state standards for advanced algebra](#) and the teacher guidebook developed by FAST.
- The training should cover the state attestation and grading system requirements that are in line with the Generation AI High School project aims.
- The subject knowledge training should support the following aims:
 - Enhance teachers' understanding and mastery of advanced algebra topics specified in the state standards.
 - Deepen teachers' knowledge of mathematical concepts and their applications in various contexts.
 - Develop teachers' proficiency in explaining and demonstrating advanced algebra topics to students.
 - Strengthen teachers' ability to address common misconceptions and difficulties that students may encounter in advanced algebra.
- The pedagogical/methodological training should support the following aims:
 - Familiarize teachers with effective teaching methodologies and strategies for advanced algebra (based on the methodological guideline developed by FAST).
 - Enable teachers to design comprehensive teaching plans and lesson plans that align with the state's requirements.
 - Enhance teachers' ability to facilitate group work and cooperative learning activities in the math classroom.
 - Equip teachers with differentiated instruction techniques to address diverse learning styles and abilities.
 - Promote problem-solving skills, critical thinking, and mathematical reasoning in the math classroom.
 - Train teachers to effectively assess students' math knowledge and skills, use different assessment tools and techniques.
 - Enhance teachers' research skills and how to use and manage additional and available online teaching and learning resources.
- The mentorship program should support the following aims:
 - Facilitate the practical application of the knowledge and skills gained during the training program to bridge the gap between theory and practice by guiding how to effectively implement the learning outcomes in real-world scenarios.
 - Refine and further develop the skills acquired during the training program by providing feedback, suggestions, and additional resources to help teachers

improve their skills, address specific challenges, and enhance their proficiency in applying the training concepts.

- Encourage teachers to maintain a mindset of continuous learning beyond the training program acting as their learning partners, recommending resources, sharing insights, and providing opportunities for teachers to expand their knowledge and stay up-to-date.
 - Support the teacher's career development following the completion of the training program by guiding setting career goals, exploring growth opportunities, and navigating career advancement pathways.
 - Support teachers' personal growth and development by identifying their strengths, areas for improvement, and personal aspirations.
 - Maintain teachers' motivation and enthusiasm for their professional performance. Provide encouragement, inspiration, and accountability, helping teachers stay focused on their goals, overcome challenges, and sustain their commitment to continuous improvement.
- The pedagogical/methodological components should include but are not limited to the following:
- 1) Student-Centered Instruction
 - Student-centered instructional methods
 - Role of the teacher in student-centered classrooms
 - Importance of Mathematical Discussions
 - 2) Differentiated instruction
 - Definition and objectives of differentiated instruction
 - Techniques of differentiated instruction
 - 3) Types of assessment
 - Diagnostic
 - Formative
 - Summative
 - Project
 - Formal and informal assessments
 - Self-evaluation
 - 4) Dynamic Softwares
 - GeoGebra
 - Technological pedagogical content knowledge
 - 5) Problem-solving / Holistic Learning
 - Holistic Learning Approach
 - Real-life problems
 - Connection with other disciplines
 - 6) Cooperative learning
 - Techniques of cooperative learning (Think-pair-share; jigsaw)
 - 7) Planning
 - Lesson planning
 - Thematic Planning

- Learning objectives
- Assessment of the objectives
- Self-evaluation

Program-related requirements

- The training and mentorship program should be based on the need assessment and involve comprehensive assessment and evaluation tools for content and process evaluation.
- The training and mentorship program should be divided into sessions or modules to be covered throughout the year. Each session should have specific learning outcomes, activities, and assessment methods. Should be considered the duration and frequency of the sessions, taking into account the time constraints and availability of the teachers.
- The recruited trainers and mentors should have expertise and experience in implementing the training methodologies in the classroom. At least one of the trainers should be a domain expert (math teacher/instructor) who is familiar with or using the defined methodologies in the classroom.
- The training should have online, and in-person sessions based on the content and methodology of training.
- The training should incorporate interactive and practical learning experiences, hands-on activities, problem-solving exercises, and group discussions.

Requirements for Computer Science Teachers and Python Programming Instructors Training and Mentorship Program

Content-related requirements

- The program for computer science teachers and industry specialists should consist of the following components:
 - Pedagogical methodological training
 - Mentorship program
- The training should cover the state attestation and grading system requirements for computer science teachers and industry specialists without pedagogical qualifications that are in line with the Generation AI High School project aims.
- The pedagogical/methodological training should be designed to support the following aims:
 - Familiarize teachers with effective teaching methodologies and strategies for delivering hybrid-style education.
 - Familiarize teachers with co-teaching strategies.
 - Enable teachers to design comprehensive teaching plans and lesson plans.
 - Enhance teachers' ability to facilitate collaborative programming projects and problem-solving activities in the computer science classroom.
 - Equip teachers with differentiated instruction techniques to accommodate diverse learning styles and abilities.
 - Train teachers to effectively assess students' knowledge and skills using various assessment tools and techniques.
- The pedagogical/methodological components may include, but are not limited to, the following topics:
 - 1) Student-Centered Instruction and age-group psychology
 - Student-centered instructional methods in a hybrid environment
 - Role of the teacher in student-centered classrooms
 - 2) Co-teaching
 - Role of supervisor and teacher assistant in the classroom
 - Teacher as a facilitator of learning
 - 3) Differentiated instruction
 - Definition and objectives of differentiated instruction
 - Techniques of differentiated instruction
 - 4) Types of assessment
 - Diagnostic
 - Formative
 - Summative
 - Project-based learning and project assessment
 - Formal and informal assessments
 - Self-evaluation
 - 5) Dynamic Softwares

- Technological pedagogical content knowledge
- Teaching with a platform
- 6) Problem-solving / Holistic Learning
 - Holistic Learning Approach
 - Real-life problems
 - Connection with other disciplines
- 7) Cooperative learning
 - Techniques of cooperative learning (Think-pair-share; jigsaw)
 - Techniques for facilitating group work, pair programming, and code reviews
 - Promoting effective communication and collaboration among students
- 8) Planning
 - Lesson planning
 - Thematic Planning
 - Learning objectives
 - Assessment of the objectives
 - Self-evaluation

Program-related requirements

- The training and mentorship program should be based on the need assessment and involve comprehensive assessment and evaluation tools for content and process evaluation.
- The training and mentorship program should be divided into sessions or modules to be covered throughout the year. Each session should have specific learning outcomes, activities, and assessment methods. Should be considered the duration and frequency of the sessions, taking into account the time constraints and availability of the teachers.
- The recruited trainers and mentors should have expertise and experience in implementing the training methodologies in the classroom and working in a hybrid environment.
- The training should have online, and in-person sessions based on the content and methodology of trainings.