



Note from the Chairman

Dear friends of STEM Synergy,

The STEM Synergy team in Ethiopia have been extremely busy over the last year engaging in activities and leading trainings. As the new Board of Directors Chairman, I want to make a regular and intentional effort to connect with you, friends and supporters of STEM Synergy, to share the impact we are making and the opportunities and challenges that lie ahead for not only STEM Synergy, but also for the youth of Ethiopia and Ethiopia herself.

Through this quarterly newsletter we hope you will gain insights into our operation, appreciation for the challenges we are helping the Ethiopian youth to overcome, and confidence that your continued support is being used effectively and responsibly.

Please support our organization and our mission by donating today at <https://stemsynergy.org/>



Dr. Nate Woods, PhD
Board of Directors, Chairman
STEM Synergy International

Our Mission

Education is the foundation for a successful and prosperous society as well as well as the a basic need for individuals to break the cycle of poverty, fulfill their potential, and build a better life for them and their families.

We encourage and inspire Ethiopian youth to pursue STEM related academic paths and careers through hands-on laboratories STEM Centers and other interactive activities.

We educate Ethiopian youth through coding and robotics training and we educate teachers through STEM focused teacher training.

We empower recent STEM graduates to create businesses and jobs through entrepreneurial and business training and technology transfer.

STEM Synergy has partnered with GE Volunteers to introduce the Next Engineers program to Ethiopia.

The Next Engineers Program is a global initiative, funded by the GE Foundation, to inspire youth to pursue careers in engineering. While open to all students, the program focuses on increasing the diversity of engineering professionals – particularly by reaching girls and other historically underrepresented groups.

Next Engineers launched in 2021, with the goal of reaching 14,000 students in four cities worldwide by 2026.

STEM Synergy and GE Volunteers have hosted a total of four Next Engineer Discovery events in Addis Ababa, through which we reached over 300 junior high and high school students.

The Next Engineer Discovery events are designed to build awareness to natural science concepts and related careers through short exploratory sessions with professionals in STEM related fields. During these sessions students connect with those professionals and can better understand the academic path to becoming a professional in a STEM field.

The first two Discovery events were held at Glory School and Vision Academy, both in the Jackros neighborhood of Addis Ababa. We were very happy to have professionals from Ethiopian Airlines’ Maintenance, Repair, and Overhaul (MRO) organization join the STEM Synergy and GE Volunteers / GE Aerospace team. During these sessions the GE Aerospace and Ethiopian Airlines team discussed the fundamentals of flight – lift, drag, thrust, and gravity. The Ethiopian Airline professionals shared their stories of how they became interested in a



job with the airline and what they studied in school.

The students were asked to design and build paper airplanes; we then had a contest to see which plane flew the furthest. The winning team then had to explain their design and how they applied what they learned during the earlier discussion.

For the third event, we returned to Glory School along with a senior engineer from GE Vernova. The engineer discussed the fundamentals of civil engineering and shared about the project he is working at the Grand Ethiopian Renaissance Dam, where GE Vernova is a supplier of the hydro-turbines used to generate electricity.



The children were extremely excited to meet an engineer working on such a high visibility project – and a project of such national importance. For an activity, the student built self-supporting bridges, often referred to as Da Vinci Bridges, from pencils. We then had a competition to see which bridge could support the most weight. The element of competition brought out the best in the students and made for a very fun and enjoyable competition!



The latest event was held at the recently constructed Science and Technology Museum (near Sheraton Hotel and Unity Park), where we hosted 40 students from Glory School. For this event, the STEM Synergy and GE Aerospace team presented and shared about how aircraft engines worked; we used the large GE90 aircraft engine that GE Aerospace has recently donated to help the presentation. We discussed what an aircraft engine does and

how it works. We identified different parts on the engine and explained what they do and why they are needed.

Finally, we discussed that aircraft engines – just like cars – need to be regularly maintained. Airlines prefer maintenance to be scheduled and predictable. Unscheduled maintenance can be very disruptive for the airlines operations and can leave their passengers unhappy because they are missing important work. The GE Aerospace team discussed the practice of engine condition monitoring, in which operational data from the aircraft is analyzed to assess engine performance and identify potential need maintenance.

The students then worked to develop and analytic that would identify when the oil filter needs to be changed with enough lead time to schedule the replacement and not create an operational disruption – but while also ensuring oil filters are not replaced to early and incurring unnecessary maintenance costs.

The groups of students then presented to the airline leadership, comprised of the STEM Synergy and GE Aerospace team. Teams were judged on technical content, clarity of presentation, and customer empathy.

By supporting this program, we hope the youth will be inspired to pursue study and careers in STEM related fields.



Coding, Robotics, & Website Development Training



STEM Synergy, in collaboration with the Ethiopian Ministry of Education and local universities, recently provided Coding, Robotics and Website development training to primary and secondary school students intending to nurture their curiosity, enhance problem-solving skills and prepare them to be competent and innovative.

This impactful outreach program was able to connect with 125 secondary school students near Debre Markos University, 120 secondary school students in the area of Debre Tabor University, 120 students in the catchment area of Arsi University (Assela City), 20 secondary students in the area of Adama Science & Technical University, 15 primary and secondary students at the country office in Addis Ababa.

The 7th Annual National Science and Engineering Fair



In December 2022 STEM Synergy helped organize the 7th Annual National Science and Engineering Fair, along with The Ethiopian Ministry of Education, UNESCO, STEM Power, and others. This fair, held at the Addis Ababa Science and Technical University, is an opportunity for students who have won local science fair competitions (also introduced and arranged by STEM Synergy), to have their projects compete for national recognition.

UNESCO invites foreign diplomats to the event, as well as encourages VIPs to be judges for the National Science Fair, as this event aligned with the UNESCO World Science Day.

At the National Science and Engineering Fair closing ceremonies, STEM Synergy presented computer laptops and tablets, donated by GE Aerospace and STEM Synergy, to the competition winners. The awards are meant to honor the remarkable achievements by the students and encouragement them in their educational journey and beyond. The award ceremony is a prestigious event in Ethiopia and is covered by national media and presided over by government officials, diplomats, and VIPs.

STEM Synergy is also organizing the 8th Annual National Science and Engineering Fair being held in November 2023. We look forward to sharing details in the next newsletter!

STEM Pedagogy and Teacher Training



The interdisciplinary learning approach of STEM education requires a competent teacher that can create a conducive learning-teaching environment. Thus, promotion and advancement of STEM Pedagogy at Classroom Level is of a paramount importance to transform the current methods of teaching/learning to a student-centered approach of teaching is applied in STEM starting from lower grades.

The multi-dimensional determinants of problems associated with education system is somehow attributed to lack of teachers' Continuous Professional Development (CPD), as one of the priorities of teacher development efforts across the various levels of the education system in the sub-Saharan Africa in general and in Ethiopia in particular.

STEM Synergy, in collaboration with multiple stakeholders, engaged to conduct capacity building training (TOT) in pedagogy, focusing on STEM education, with the goal of creating a conducive and effective learning environment for students by employing a multitude of teaching-learning styles.

In February 2023 STEM Synergy, in collaboration with Debre Birhan University, provided laboratory-based TOT for 120 secondary school Biology, Chemistry, Physics, and Information Technology teachers from 24 Woredas in the North Shoa Zone as well as school supervisors from each of the 24 Woredas.

Promoting STEM education for girls in Ethiopia



STEM Synergy believes supporting our girls to pursue study and careers in STEM related field will restore their confidence in themselves and their skills. Self-confidence and self-awareness are the first steps in garnering academic success and success in life. Making STEM education a friendly place for girls is important to opening the door to wonderful new opportunities for their future and securing the future of Ethiopia.

STEM Synergy, in collaboration with local universities and other STEM stakeholders recently organized a STEM training program for primary and secondary school female students. This training focused on improving knowledge and skills in the areas of Biology, Chemistry, Physics, Mathematics, Electronics, ICT, Buna Script (coding), and smart agricultural disciplines. The learning was hands-on (laboratory based) and included completion of projects in which the individuals or teams applied learnings to everyday challenges in their community. Some of these projects focused on creating machines and automating everyday processes like sieving, creating raw fertilizer, weed removal and ploughing, roasting coffee beans, and even manufacturing bars of soap.

The best performing STEM field female university students were recognized in an awards ceremony.



Entrepreneurship, Financial Management, & Project Management training



STEM Synergy, in partner with local universities, works empower and capacitate recent STEM graduates with skills in entrepreneurship, financial management, and project management. These skills will help these recently graduates successfully run their own business and develop to become job creators.

In April 2022, STEM Synergy provided Entrepreneurship, Financial Management, & Project Management training to 105 recent STEM graduates at Debra Markos University.

In April 2023, STEM Synergy provided Entrepreneurship, Financial Management, & Project Management training to 200 recent STEM graduates at Debra Tabor University.

In May 2023, STEM Synergy provided Entrepreneurship, Financial Management, & Project Management training to 200 recent STEM graduates at Arsi University.

Summer outreach programs



STEM Synergy believes in the power of hands-on experiences to retain the youth's interest in STEM related academic paths. Students need to be introduced to the science, technology, engineering, and math related concepts from an early age to sustain their interest in such subjects and encourage them to pursue a career in a STEM related field. It is more important than ever to help children embrace STEM.

To address this urgent and critical need, STEM Synergy has established a summer outreach program operated out of existing STEM Centers, which focus on junior and senior high school students in the catchment area of the different STEM Centers. These programs help improve knowledge, skills, and sustain interest of students in STEM related fields and encourage them to continue pursuing STEM related studies while they are in school and STEM related careers as they progress.

These programs also help the students develop critical thinking skills and problem-solving ability that create the foundation for their success in any field they chose to pursue.

In the summer of 2022 STEM Synergy's outreach program reached over 300 students within the catchment areas of Debre Birhan University (North Shoa Zone) and Debre Birhan City.

These summary programs have been shown to be very successful and are an effective approach to increasing the youth's interest in STEM education and keeping them engaged in a related field of study.

Final remarks and call to action

STEM Synergy believes that education, particularly education in STEM related fields establish the foundation for both the success of the individual and the society. It is imperative that we prioritize and invest in future generations to ensure they are exposed to STEM concepts from an early so that their curiosity is ignited and the flame of passion for STEM education is sustain.

It is evident that the STEM centers and STEM focused activities and trainings that have been completed have been made a definite impact on students' academic achievement in science fields, attitude toward sciences and technologies, and on improving their creativity and innovation skills.

The programs our organization planned to implement are believed to have significant impact towards mainstreaming STEM Program in the education system of Ethiopia, where its implementation require soliciting and securing reliable sources of funding from individuals, corporations and foundations.

The STEM Synergy team is planning for even more trainings and more engagements in 2016 (E.C.) focusing on Summer Outreaches, Coding, Robotics, & Website Development, STEM Girls Camp, STEM Teachers and School Leaders training, Entrepreneurship, Financial Management, & Project Management training, Conduction the National Science Fair (including awards for the competition winners).

Such great initiatives are only possible with your generous donation – and the need now is greater than ever! The table below presents the engagements our organization plans to support, but we cannot do this without the kind support from donors like you. No matter the amount of your donation, it will make a direct impact on those that we are serving.

Please give now at <https://stemsynergy.org/>.

2016 (E.C.) programs and budget need					
Training Type	Duration	Impact (No. of students/teachers)	Budget required		
			Eth. Birr	USD (\$1=56Birr)	
Summer outreach	5 – 6 weeks	300-350	690,000	12,321.40	
Summer outreach	5 – 6 weeks	150 - 180	345,000	6,160.70	
Summer outreach (Mathematics and English)	5 weeks	120	92,000	1,642.85	
Coding and website development	5 weeks	120	400,000	7,142.90	
Coding and Robotics	5 weeks	60	200,000	3,571.43	
STEM Girls Camp	5 weeks	60 (girls)	200,000	3,571.43	
STEM Teachers capacity development	7 days	120	300,500	5,366	
School leaders training	3 days	60	250,000	4,464.30	
Entrepreneurship, Financial Management, & Project Management training	5 days	250	400,000	7,142.90	
Organizing & Conducting Local & National Science Fair	1 NSF & 2 LSF	1000	500,000	8,928.60	
Robotics and Coding Training per student					
a	Lower level (Grades 5 and below)	10 months	Cost per student	23,850	425.9
b	Middle level (Grade 6 th – 8 th)	10 months	Cost per student	26,500	473.2
c	Higher level (Grade 9 th and above)	10 months	Cost per student	29,150	520.55