



## Bahir Dar University

### Bahir Dar Science, Technology, Engineering, and Mathematics (STEM) Incubation Center

### 2014 Summer Training Report



October, 2014

# **1. Introduction**

## **What is STEM**

STEM is an acronym for Science, Technology, Engineering, and Mathematics and usually refers to education in one or more of those disciplines. STEM initiatives started as a way to promote education in these related areas so that students would be prepared to study STEM fields in college and pursue STEM-related careers.

## **Vision**

- To be internationally competent STEM center

## **Mission**

- To provide competent students with high learning experience, that mainly focuses on hands on activity in science, mathematics and engineering laboratories.
- To be assessment and standardization center for school education.
- To establish school based Technology park.
- To establish School-University-Industry linkage.

## **Objectives**

- Training and project advising for talented students.
- Organizing and supporting a variety of school clubs.
- Provision of laboratory based education for school students.
- Provision of short term training for school teachers.
- School based technology park establishment.
- Assessment and standardization of school education.
- Incubating school students' project work and creativity.
- Administration of various extracurricular activities to students such as science fairs or Olympiads, aptitude tests and other competitions.
- Summer Outreach program training.
- Provision of media based education to community.

## **Bahir Dar STEM Incubation Center Facilities**

The Bahir Dar STEM Incubation Center has the following facilities

- 11 Laboratory Rooms (Physics , Optics, Space Science, Chemistry, Biology, Biochemistry, Electronics, Mathematics, ICT (Two Rooms), Workshop)
- Mini Library
- Meeting Hall
- 3 Offices ( Manager Room, Store Room, Staff Room )
- 4 Toilets( Staff (Female/Male), Students (Male/Female))

## 2. The Summer Training Program Overview

The training, with the motto: “In every child, there is a scientist” is being offered to 340 students who were drawn mainly from three zones of the Amhara National Regional State. Students from Benishangul Gumuz Region were also given the opportunity. The training was hands on practical laboratory experiment followed by students’ presentation, report writing and project works including mathematics.

Students were grouped as **Group 1** (Grades 7 and 8), **Group 2** (Grades 9 and 10), and **Group 3** (Grades 11 and 12), and divided into sections with 25 students each. The training was given mainly on the school subjects Mathematics, Physics, ICT, Chemistry, and Biology. In addition, the program includes Electronics, Technical Drawing, and English Language training and all were given for 25 hours from July 14 to September 5, 2014. One university instructor, and one laboratory technical assistant helped 25 students in a laboratory for three hours a day. Science, Mathematics and English Language Subjects were conducted in STEM Incubation Center Laboratories. ICT, Electronics and Technical drawing subjects were conducted in Institute of Technology Laboratories.

### **Number of Participant Students**

- Group-1 (Grade 7- 8): 4 Sections x 26 Students = 104 Students
- Group-2 (Grade 9- 10): 5 Sections x 25 Students = 125 Students
- Group-3 (Grade 11- 12): 3 Sections x 25 Students = 75 Students
- Total Number of Students: 304 Students

### **Participant Students Region/Zone/Woreda**

- Governmental and Private schools in Bahir Dar City: 160 Students
- West Gojjam Administrative Zone: 37 Students
- East Gojjam Administrative Zone: 37 Students
- Awi Administrative Zone: 26 Students
- Benshangul Gumuz Region: 20 Students
- Bahir Dar University Community Children: 20 Students
- Bahir Dar University Satelite Woredas(Birr Adama & Kolela): 4 Students

## Sample Laboratory Activities



Grade 7 and 8 Students in Mathematics Laboratory



Grade 9 and 10 Students in Biology Laboratory



Grade 7 and 8 Students in Physics Laboratory





Grade 11 and 12 Students in ICT Laboratory



Students in Mini Library



Grade 7 and 8 Students in Chemistry Laboratory



Grade 11 and 12 Students in Biology Laboratory

### 3. Motivational Discussion to Inspire the Future Scientists

The President of Bahir Dar University, Dr. Baylie Damtie, made a discussion with the 2014 summer outreach program trainees of Science, Technology, Engineering and Mathematics in STEM Incubation center hall. Sharing the experiences of great minds in science, Dr. Baylie has inspired and encouraged the students to exert necessary efforts to conquer their destinies. It has been indicated that the training offered to the students by the university is meant to be supplementary to the students' previous backgrounds.

Issues related to the delivery and relevance of the training has also been addressed. Some of the student trainees have indicated that the present training would help them acquire new theoretical and practical skills.



Dr. Baylie Damtie during the discussion





Students during Reflection

#### 4. Closing Ceremony of the Summer Training Program

After offering the 45 days summer training on Science, Technology, Engineering and Mathematics, the program was officially closed in the presence of Dr. Tesfaye Shiferaw, Vice President for research and community service of Bahir Dar University.

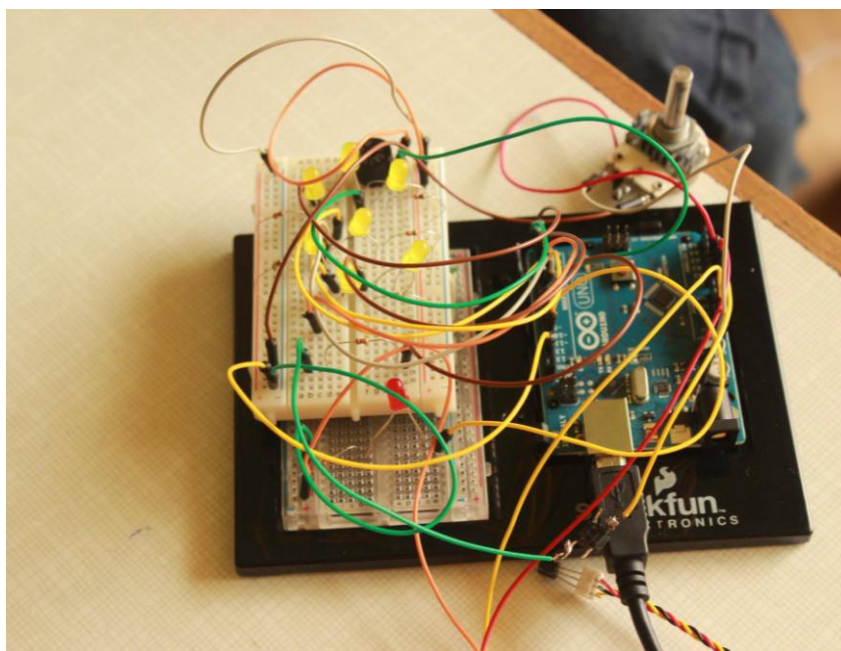


Students in the university Auditorium Hall



Students during reflection in the university Auditorium Hall

The students, at the end of the program, have made a demonstration on their works on different technological experiments such as house heat control mechanism, home electric power control, etc. and debating program. During this program, Assefa Misganaw and Molla Alehegn shared their experience on the way technology is used, software development and time management.



Students project work on house heat control mechanism





Students during the Grand Debating Program



Molla Alehegn and Assefa Misganaw Sharing Their experience in Software development

Dr. Tesfaye Shiferaw, Vice President for research and community service gave a closing remark and advice on students' future career and responsibility to share what they have acquired from the training. He finally gave rewards and certificates to students who were best in problem solving competitions.



Dr. Tesfaye Shiferaw, Giving closing remarks, and certificates

## 5. Students Project Work Presentations

During the previous training programs, some more talented students were identified by their respective instructors' team and after the completion of the summer programs, there were **Aptitude Tests** for each group on mathematics. Hence based on the above two mechanisms, 10% of the participant students were selected each year for further additional advanced training and project works during the whole academic year.

- So far  $45 + 52 = 97$  students were selected in the years 2012 to 2013
- $30 + 35 = 65$  students were actively participating in projects and trainings.
- 35 students presented their work during the inauguration ceremony of STEM Center in September 12, 2014.



Project work presentation in Mathematics Laboratory





Project work presentation in Physics Laboratory



Project work presentation in Electronics Laboratory





Project work presentation in Computer Laboratory



Project work presentation in Electronics Laboratory



Project work presentation in Chemistry Laboratory



Project work presentation in Biology Laboratory

## 6. Official Inauguration of STEM Incubation Center

The center is built by Mr. Mark Gelfand, a generous philanthropist committed to assist the development of science and technology in Ethiopia. Costing over 12.5 million birr, the complex will be serving at the centre of exposing young and enthusiastic students to the world of science and technology.

Expressing his deep appreciation to Mr. Mark Gelfand, the President Dr. Baylie Damtie has indicated that the facility having 12 state of the art laboratories will be instrumental in creating a generation versed with scientific and technological capability.

BDU's Vice President for Research and Community Services Dr. Tesfaye Shiferaw on his part, while explaining the future plans of the incubation centre, underscored that the complex will be influential in laying scientific foundation to a better community services.



Mr. Mark Gelfand, Speaking on STEM Education in Ethiopia



Dr. Baylie Damtie, Welcoming Guests





Dr. Tesfaye Shiferaw, Presenting Outreach Program Report and Future STEM Plan



Dr. Baylie Damtie, Awarding Certificate to Mr. Mark Gelfand



Dr. Baylie Damtie, Awarding Certificate to Dr. Col. Alemayehu G/Egziabher



Dr. Baylie Damtie, Awarding Certificate to Mrs. Abeba Eshetie

Some students who took part in the opening ceremony demonstrated their work in science and technology areas. Some of the beneficiaries of the incubation centre have expressed their happiness for having such a stimulating scientific experimentation ground.

The event was held in the presence of the university's academic staff, Bahir Dar University management, ministry of Education, Amhara Education Bureau, Bahir Dar city educational offices and summer outreach program participating students.

Mr. Mark Gelfand has previously been awarded life membership by the university.



Students involved in project works





Invited Guests during the Inauguration Ceremony of STEM Center Partially

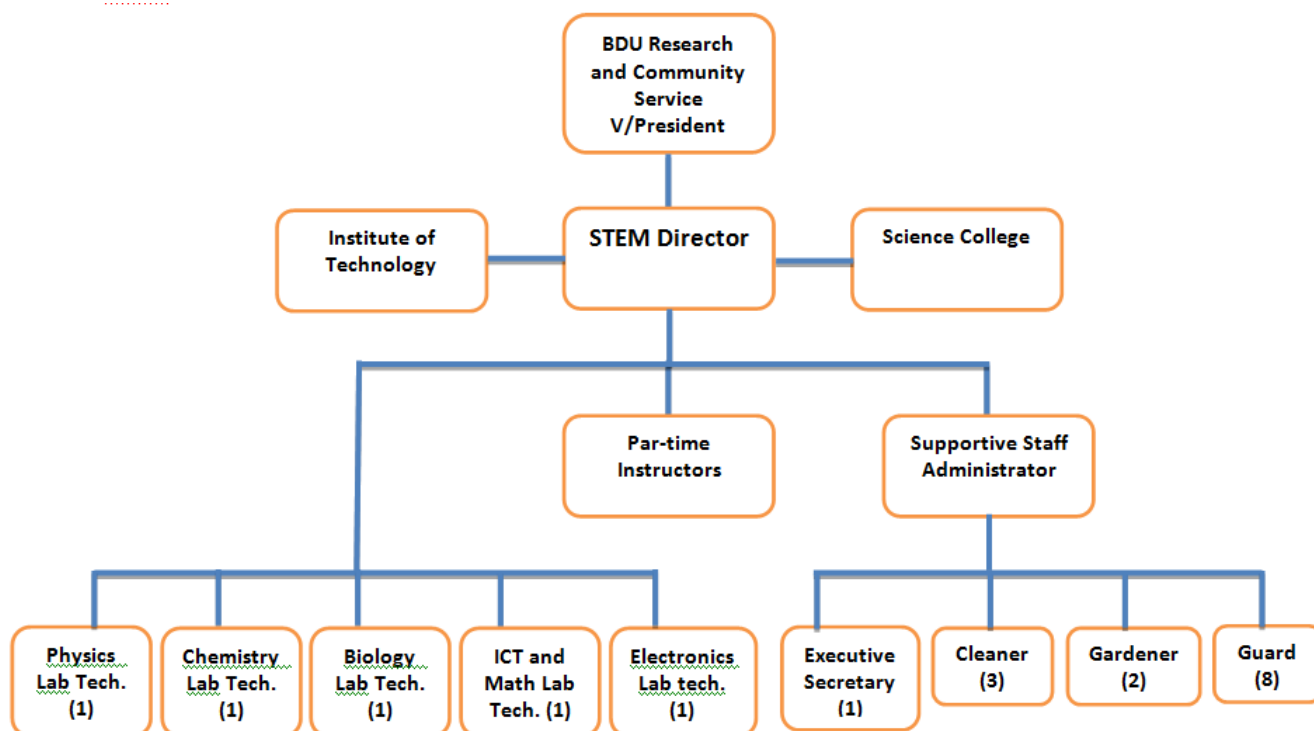


Photos during the Closing of the Inauguration Ceremony



## 7. STEM Incubation Center Administration Structure and Future Plan

### Administrative Structure



### Future Plan

- **Supporting Schools and school students**

- ✓ Supporting Science and Technology clubs;
- ✓ Providing teaching and learning resources, like audio and video files, books, laboratory manuals, learning/teaching softwares and standardized exam items;
- ✓ Providing Library, Internet and Laboratory Services to students including primary school students.

- **Functioning the STEM Incubation Center fully** for the whole academic year so that students either individually or in group or with their school teachers can conduct laboratory works.

- **Supporting Innovation**

- ✓ The STEM Center will be a Technology park

- **Searching and supporting more talented students to involve in projects.**

## 8. Expenses

- Students Food, Dormitory and Medical Expenses: **131,802.08 ETB**
  - Financed by Research and Community Service V/President Office, Bahir Dar University
- Instructors and Laboratory Technicians Professional Fee: **290,220.00 ETB**
  - Financed by Research and Community Service V/President Office, Bahir Dar University
- Construction and Lab equipment Purchase: **12,500,000.00** (12.5 Million ETB)
  - Financed by Mr. Mark Gelfand and Family Charitable Trust
- Total Expense: **12,922,022.08 ETB**

## 9. Collaborations

- Mr. Mark Gelfand and Family Charitable Trust
- MOE
- Amhara Educational Bureau
- Benshangul Gumuz Educational Bureau
- Bahir Dar City Educational Offices
  - ✓ Funding the Outreach Program and STEM CENTER
  - ✓ Selection of Students
  - ✓ Covering Transport costs of students.