

Results of collaboration between Morgan State University and five universities in Ethiopia

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Executive Summary

Dr. Astatke had a very successful trip to Ethiopia from May 21 to June 6 2012, where he coordinated the **Science Technology Engineering and Mathematics (STEM) conference** that was held in **Addis Ababa, Ethiopia on May 24-25, 2012**. The conference was organized in collaboration with the **19th Africa Achievement Awards and Economic Forum** sponsored by the African Times Newspaper (see <http://Awardsforafrica.com>) . Dr. Astatke also **delivered the 15 laptop computers, 40 Mobile Studio Boards™, and other various accessories that were donated by Analog Devices Inc ADI**. The training workshops and hands-on sessions would not have been possible without the generous support of ADI. Therefore, I want to send my sincere appreciation on behalf of Morgan State University, and the five universities in Ethiopia to ADI, and **Innovative STEM Solutions (iSTEMS)** for providing funding to cover my travel and shipping expenses to Ethiopia. The two day STEM conference was held on the campus of Addis Ababa Institute of Technology (AAiT). The training workshops were attended by 15 participants that consisted of Electrical and Computer Engineering (ECE) faculty members, department heads, and members of vice president's office for academic affairs **from five different universities: Addis Ababa (AAU), Hawassa (HU), Bahir Dar (BDU), Debre Birhan (DBU), and Jimma (JU)**.

The training workshops were held in two different rooms that were provided by the ECE department of AAiT. During the first day of the workshop, participants received training on the **Dimensions of Learning (DOL) pedagogy** and how it can be used to improve course development and delivery. This workshop was based on my experience in applying the DOL pedagogy in all my courses for the past seven years. The participants were shown actual examples of the implementation of the DOL pedagogy in my courses by looking at sample course syllabus, lecture notes, and example problems with learning outcomes, etc... This part of the workshop/training was done first because I wanted to make sure that all participants were aware of various **effective teaching pedagogies** that can improve the development and delivery of any engineering course. During the second day of the training workshop, we conducted hands-on training on the use of the Mobile Studio technology and pedagogy with the ECE faculty members. The 12 ECE faculty members were able to build simple circuits and test the different features of the Mobile Studio Board and software. They were then given a **demonstration of the advanced features** of the Mobile Studio software by a **faculty member of AAiT** that has been using the Mobile Studio board technology since 2009. This is very encouraging because it shows that we have now faculty members in Ethiopia that have enough experience to train the new faculty members from the other universities. This is a **clear example of the capacity building and knowledge transfer** that can occur when universities in the USA and Africa enter into long term collaboration. Although the addition of the mobile studio boards does not solve all their laboratory equipment problems, each university has told me that it will allow their students to **conduct some of the electric circuits and electronics circuits laboratory experiments outside of the ECE laboratories and in regular classrooms and dormitories**. The pictures below illustrate how each university is using the equipment that has been donated.

5th year AAiT student pictures (June 2013)



Students working on a wireless health monitoring system for hospitals (left side). Students working on an autonomous car for landmine detection (right side)

Bahir Dar University student pictures (June 2013)



ECE laboratory set-up using new equipment (left side). Students conducting ECE labs in groups of 4 to 5 students (right side)

Hawassa University student pictures (June 2013)



Students conducting ECE labs in groups of 4 to 5 students (left and right sides)

Debre Berhan University student pictures (June 2013)



Students conducting ECE labs in groups of 4 to 5 students (left and right sides)