

MIT AITI-Ethiopia

JULY/AUGUST 2006

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Part I: Executive Summary

Purpose of the Report

The purpose of this report is to present what the AITI-Ethiopia team did in the summer of 2006 to the stakeholders of the program. It gives a thorough overview of the MIT-AITI experience from the preparation stages of the program to its conclusion. In this report, we discuss how the program was designed and implemented, what problems we encountered during our stay, and how we solved them. At the end of the discussion, we will make specific recommendations to future AITI-Ethiopia teams based on our experiences this summer. We hope this report will be a useful resource for all parties interested in the exciting program of MIT-AITI.

Part II. Program Description

1. Overview

a. General Program Description and Objectives

“The MIT-Africa Internet Technology Initiative (MIT-AITI) is an innovative program started by MIT students to integrate computers and Internet technology into the education of students in African schools. The program uses innovations such as cutting edge programming tools and free open-source systems to introduce students in Africa to the Internet, and to equip them with skills that will allow them to be creative and resourceful”¹. To that end, MIT-AITI sends five or six MIT students to Africa each year to give an intensive six weeks course on Java Programming and entrepreneurship. So far, MIT-AITI teams have gone to Ethiopia, Kenya, Ghana and Zambia.

b. History of MIT-AITI in Ethiopia

MIT-AITI in Ethiopia started in the summer of 2003. Since then, the program has been consistently implemented except in the summer of 2005, when security concerns forced the program to shift to Zambia. All students come from the Addis Ababa University (AAU) Technology Faculty.

The AITI program is very popular among Addis Ababa University students as evidenced by a high turn out of applicants during the summer of 2006.

We attribute this mainly to the increased popularity of AITI certificates in the job market. However, it is also due to the fact AITI teaches Java: a programming language that is not offered in the university.

AITI has been very successful in Ethiopia. We heard from students that the Java programming lessons they learned from AITI have helped them to do class projects. Many graduates have earned credibility in the job market. Above all, one AITI student has managed to create his own software company and pursue a career in software development. This is a testimony to the impact of AITI in Ethiopia.

c. **Country and School Information**

Ethiopia

Ethiopia is located in the Horn of Africa. It is bordered by [Eritrea](#) to the north, [Djibouti](#) to the northeast, [Somalia](#) to the east, [Kenya](#) to the south, and [Sudan](#) to the west. Ethiopia is the oldest independent country in Africa. Here are a few facts about Ethiopia:

- Population – 74.2 million (UN 2005)
- Capital City – Addis Ababa
- Major languages – Amharic, Oromo, Tigrinya, Somali
- Major religions – Christianity, Islam

Addis Ababa University (AAU)

Addis Ababa University is the oldest and leading institution of higher education in Ethiopia. It started its operation in 1950. AAU runs Diploma, Bachelors, MD, DVM (Doctor of Veterinary Medicine), Masters, and PhD degree programs. It launched its first MSc programs in 1979 and its first PhD programs in 1987. There are close to 30,000 students in AAU out of which about 25,000 are undergraduates and 5000 graduates. MIT-AITI began its project in AAU in summer of 2003.

2. Preparation for the Program while at MIT

1. Curriculum Building

1. Java

Our curriculum was initially designed to teach Java Programming Language and Entrepreneurship in six weeks. However, we made major modifications to the curriculum as we were forced to shorten our program to four weeks.

For our java lectures, we used power point slides which the Kenya 2005 team used in the previous summer. These slides, which are accessible on MIT-OCW, helped us structure the program in a way that made the lectures coherent and easy to follow. We modified, deleted, and added slides during the program to teach the most important topics to the students within the limited amount of time we had.

There were seventeen java lectures which we divided among team members. Each team member had at least three java lectures to teach while two of the five members had four. However, those students who had three java lectures were responsible for the Entrepreneurship seminars.

Team members were also responsible to design labs for topics covered in their lectures. Our initial intention was to use labs which were on OCW but the solutions were available on there as well. However, we decided to merely modify the labs instead of changing them completely.

Julie and Tawanda were responsible for arranging the CDs required to install Eclipse on the computers. Tawanda took multiple copies to Ethiopia which proved to be an excellent idea since many students were asking for them to download Eclipse to their personal computers.

2. Entrepreneurship

Given that none of us had any experience in entrepreneurship before, we initially intended to use the existing power point slides as a template for our lectures. However, while some of the slides gave a solid introduction to the fundamental ideas of entrepreneurship, we feared that they do not relate directly to a specific country. Therefore, we decided to give a brief introduction to entrepreneurship and focus on inviting guest speakers who are young and successful business entrepreneurs in Ethiopia.

Our entrepreneurship curriculum also included a business competition, which entailed writing a proposal for a business idea. Although we did not decide on a prize while we were in MIT, we agreed that monetary reward would be the most likely choice.

3. **Seminars**

Time permitting, we decided to include short seminars where each member of the team presented on a topic that he/she thought was useful or interesting to the students.

2. **Logistical Preparation**

Primary logistics include planning the Ethiopia team's flight arrangements, organizing lodging for our seven-week program, getting all the vaccines and medications needed to travel safely in Africa, and making sure we were culturally prepared for our stay in Addis.

1. **Travel**

The AITI Logistics Manager arranged for all of our flights to and from Ethiopia on KLM and British Airways. Team members were given amazing flexibility in deciding exactly when they wanted to arrive to and depart from Ethiopia based on their schedules and final travel destination. Jeremy and Bruck stayed an additional one and three weeks in Ethiopia respectively to travel and spend time with family, while Saba continued on Pakistan after leaving Ethiopia instead of heading back to the U.S.

Acquisition of visas was also handled very well by the AITI executive committee. For Saba, Tawanda, and Julie, visas were handled through the Ethiopian embassy while we were still in the U.S. and Jeremy was allowed to purchase his own visa (USD20) in the airport upon arrival.

All vaccinations were handled directly through MIT medical. After an evening lecture outlining the different types of malaria medications, typhoid vaccines, etc. which were available to us, each team member made their own arrangements to get their shots in late spring, well before we departed.

2. Housing & Local Logistics

All housing costs were covered by AITI, with Bruck's family serving as a liaison in Addis, locating a house and agreeing on the price. Our housing arrangement in Ethiopia was exceptional. Upon arriving in Addis, we discovered we were living in a western-style home in a very safe neighborhood in southern Addis. Two maids and a night watchman had been hired to cook, clean, do laundry, and guard the house after dark.

The team ran into two major issues in the airport, however, regarding taxes on digital projector and OpenCourseWare hard drives that could be recouped upon our departure. We could easily do this for the projector, as we planned to return it to the United States when the program was complete, but we were donating the hard drives to local universities to be used as mirror servers for the extensive OpenCourseWare libraries available online. Again, Bruck's family graciously provided the deposit on the projector. Bruck, however, had to spend four full days stalled in government bureaucracy before he could get the paperwork he needed to classify the hard drives as educational material which is exempt from import taxes.

3 Cultural Preparation

Bruck, having been raised in Ethiopia and lived in Addis for most of his life, was instrumental in explaining to the rest of the team exactly what to expect while living in Ethiopia. He clarified the meaning of first and last names in Ethiopia, the Ethiopian method for keeping time, how one shakes hands, eats politely, etc. Most importantly, Bruck's presence allowed us to get fair prices while we traveling and living in Ethiopia. Foreigners are often overcharged in Ethiopia even for small purchases like Coca Cola. When Bruck was not available, having reliable guidebooks (Lonely Planet and Bradt are the best) were invaluable.

4 Team Building

To get to know each other and build our curriculum, all five Ethiopia 2006 team members met weekly on Sunday afternoons for two to four hours. Because every member felt comfortable giving lectures, we

divided our lectures in fifths, giving every team member three or four hour-long lectures to research, refine, and practice. Each week, every team member would deliver the first 15 slides of his or her presentation to the rest of the team to practice the delivery and get feedback. While it took time to get everyone up to speed in Java, meetings ran very smoothly by the end of the term.

When someone could not attend a meeting, we would schedule a makeup session so that everyone had delivered at least three lectures prior to leaving for Ethiopia.

5 Interaction with AITI Leadership

The Ethiopia 2006 team was in frequent contact with the executive committee. While email access was often limited, we would send weekly reports back to the U.S. describing how the class was going and outlining any major changes and decisions that we had made. Bryant Harrison, AITI president, was an excellent resource for asking questions about the program, funding, etc. and was quick to respond. We were also heavily involved with Edward Mabonga, logistics head, as he tailored together our flight schedules to and from Addis. Overall, our team felt that the executive committee did an excellent job giving us guidance while still supporting our ability to make decisions on our own. In our first weeks abroad, for example, when we had to make major changes to our curriculum, the executive committee made recommendations on what the final goals of the program should be, but entrusted us with running the revised program on our own.

3. Course Structure

1 Overview

All classes and lab work were carried out in facilities of the Electrical Engineering and Computer Science department of the Technology Faculty at AAU. Because political protests had pushed the academic calendar well into August, we had to restructure our class schedule to accommodate the time constraints of our students and the facilities that would be available at the university. The course was shortened to four and half weeks, 8 hours of class time per week. Java and entrepreneurship lectures were given in a 100-seat lecture hall three afternoons per week. Lab sessions were carried out over the weekends in a 20-person computer lab.

2 Schedule and Class Operation

Student Selection:

Due to a major communications breakdown within Addis Ababa University, the Technology Faculty had not prepared facilities for us to use, nor had they selected a group of students to take our class. We held an open meeting to gauge student interest and the student's enthusiasm was overwhelming. 150 students came to the meeting to fill the 70 spots we advertised. After processing the surveys, it became clear that the majority of our students had experience in some programming language (mainly C and FORTRAN) but very little exposure to Java. Each survey also contained a seven-day hourly timetable where students filled in what times they were unavailable to take the class. Priority was given to 4th and 5th year students, so the schedule was structured around which times the majority of them could attend lecture. All 3rd, 2nd, and 1st year students who could attend the lecture time were subsequently admitted. To make up for our reduced schedule, we decided to admit a total of 100 students.

Lecture:

Java lectures were given twice weekly on Thursdays and Fridays. During each of these 90-minute sessions, two team members would deliver the lecture they prepared for the day but reduced in length by 25%. All lectures were taught mainly with PowerPoint presentations coupled with three minute "pop quizzes" given four to five times per lecture. The most advanced topics, namely Swing and GUI lectures were not given due to lack of time. Typically, the lecturer would introduce a topic in theory first, followed by a simple coded example and a pop quiz. If we got the sense that few students were answering the pop quiz questions successfully, we would continue to explain the topic until everyone understood.

Because there were so few lectures, attendance was mandatory. Attendance was taken daily and if a student missed more than three lectures, we met with them to discuss whether or not they felt they could complete the class.

To make lectures more accessible to our Ethiopian audience, we went to great lengths to incorporate local names, places, and topics into our lectures. The more cultural attention we put into lectures, the more our students seemed to enjoy being there. Bruck taught the rest of the team

a series of common phrases and commands used by Ethiopian instructors which our students loved hearing foreigners repeat in class.

Entrepreneurship lectures were also given once a week. After the AITI team introduced the basic ideas behind business models, producers and consumers, etc. to the class, two Ethiopian executives were invited to lecture on how they started businesses in Ethiopia. The students responded to these lectures well, giving a standing ovation to the presentation given by a young and charismatic manager of an Ethiopian web-design firm.

Lab/Problem Sets:

Seeing that we only had access to 20 computers for our 100 students, and because each student's time was so precious, we opted to bring five sets of twenty students into a 3-hour lab sessions given on Saturdays and Sundays. Our problem set assignments were generally written to be completed within the three hours, although this sometimes proved challenging for our younger students and those who were not studying EECS. Still, the instructor-student ratio of 1:4 during these sessions gave us the flexibility to give students the help they needed in lab. After working nine hours on Saturday and six hours on Sunday, weekends were easily the most taxing part of each week.

Problem sets increased in length and difficulty as the course went on, culminating with a GradeBook assignment which combined many of the concepts covered in class into one useful program.

Final Exam:

A very large portion of our students' final grade was placed on their exam at the end of the program. Several students had to share computers during lab sessions, so this was our one gauge of each student's individual ability at programming. Mean score on the final exam was a 64% with a standard deviation close to 20%. The high standard deviation was reflective of how well some students had understood the material, and how some had struggled through the course.

Grading:

Ultimately, grading was based on a pass-fail system. If students attended lecture, completed all three lab assignments, and scored above a 45% on the final exam, they were given a certificate of completion. Of our 95 students who regularly came to lecture, 85 completed all

assignments and took the final exam, and 75 passed the final and received certificates. Given the amount of stress our students were under, taking exams in their spring term classes and finishing other final projects, we consider this quite a success.

Final Project:

The final project was based on Object Oriented Programming. The students had to create 2 interactive classes, namely Student and Course and implement certain methods given to them for each class. Data from these first two classes was then to be effectively used in a third class, the Gradebook (class). This project was longer than the first two, so we gave the students about a week to finish it. They were allowed to collaborate with other class members, but were reminded to come up with their own code for the entire project. They could also call us or email us after the lab session if they had any problems, which some of them did. It was quite challenging for many students, but most of them understood the general idea.

Some of the students were really creative; they used skills from other languages and material we had not taught them to come up with amazing modifications of what was expected of them. We were really proud of those who decided to do some extra work to make their projects perfect

Curriculum and Resources:

At the beginning of the course we handed out full hard copies of our java course notes to the students and made soft copies available for those who had not been able to get them due to shortages. We also gave them links to sites with more information on certain topics whenever necessary, especially on <http://java.sun.com/> with very helpful tutorials and references, and directed them to MIT OpenCourseWare or OCW (under MIT Special Programs, SP772) for greater detail of what we taught or extra Java skills.

Schedule and Teaching Delegation:

Our Java lectures were held at 5pm every Monday and Friday only, because the students, although highly interested in our program, also had exams coming up. We gave 13 lectures and taught them in rotation among all five of us.

We explained several Java topics in detail and gave them pop quizzes to test their knowledge after almost every lecture. These quizzes were not for credit. We also gave the students handouts with questions testing their knowledge of the previous lecture to ensure that they were up to track with the information they were supposed to know, and to prepare them for the lab sessions.

Entrepreneurship

We had doubts about the success of the entrepreneurship part of the program since students were having final exams the very next week. However, it was much better received than we had anticipated.

Our basic goal for this part of the program was to encourage the students to apply their minds outside the academic realm, to use their creativity, and think outside the box to come up with innovative initiatives for starting their own businesses. To this end, we gave 5 lectures on entrepreneurship, one by each team member. Due to the compressed curriculum, we gave all five lectures within a one and a half hour block near the end of the first week. Topics covered were Introduction to Entrepreneurship, Entrepreneurship in the developing world, Innovation, Writing Business Proposals, and Outsourcing/off-shoring. Tawanda was responsible for this part of the course, so he led the effort in contacting the CEOs, though by the end of the day, we were all equally involved.

The second and third lectures were by guest speakers. We made an effort early on to find these speakers. Interestingly, both the companies we decided to contact were brought to our attention by billboards in Addis Ababa. We went and spoke to the CEOs, who received us very warmly and agreed almost immediately to speak at AAU. Our first guest speaker was Ato Tekeste Habtu from Cybersoft, one of the leading software companies in the country. The company had been in existence for eight years now, and had been quoted in books by Western writers. Our second guest speaker was Ato Michael Mahdere from AfroLink, a graphic designing and website company, in existence for three years. We thought this somewhat newer company would be an interesting contrast to Cybersoft, which was well established. Both speakers spoke very eloquently and surpassed our expectations in motivating the students to consider starting their own companies after they graduated. We thanked them by presenting Thank-you cards signed by the AITI team. The students had many questions, especially for Ato Mahdere's talk, since he was also an AAU alum and a young entrepreneur. We were very excited

to see the students' lack of shyness in participating in discussion at the end of the lectures.

We had our Business Competition on a Saturday, the day after we gave the Final Exam. It was the weekend before the students' finals for their department, so we were happily surprised by the turnout of the audience as well as the quality of ideas presented. We had posted flyers about the competition, which was open to all, a week or so in advance. We required the students to submit a 2-5-page proposal on their business idea a day before the actual competition so that we could skim over them and shortlist the teams that sounded promising.

In the interest of some faculty guidance in the judging process, as well as involving the management faculty in this competition, we requested the Dean of the Faculty of Management to be a member of the judging panel, along with the AITI team. He happily conceded, and then promptly asked us why we hadn't contacted him earlier so he could also get students from his own department involved in the competition. He also stressed the importance of collaboration between the Technology and Management departments and students, which we were very happy to hear about.

The competition itself was a great success. About 18 teams submitted proposals, but 15 showed up to present on the day of the competition. We were very impressed by the quality of the students' ideas, their enthusiasm, and their willingness to participate in the 5-min Q&A session at the end of each presentation. Most students were so excited to talk about their ideas that they went over the designated time limit of 5-7 minutes and we had to gesture repeatedly for them to wrap up. However, we noticed that most students were lacking in presentation skills using PowerPoint.

The judging process was difficult, since we could only give out prizes to three teams. The prizes went to the following teams/ideas:

Third prize: Creation of Flash Animation advertisements for Ethiopian television

Second prize: Microwave for making of Injera, or Ethiopian bread.

First prize: Gel-based efficient fuel source

Other notable ideas were:

- A customized web tool to find academic resources for Ethiopian students

- A chicken farm
- Waste recycling in Addis Ababa
- Wind-vanes in the Simian Mountains of Ethiopia to harness wind energy

All in all, we felt the entrepreneurship part of the course was extremely valuable to AAU technology students, in light of the fact that their own departments offer nothing like it. A technology student cannot take management electives, and for this reason, it was viewed as a rare opportunity to be made good use of.

We luckily found the ideal guest speakers, who did a stellar job of motivating the students to become entrepreneurs. Worth mentioning is a recurring example used by Ato Tekeste in his PowerPoint slides. He used advertisements by Accenture, the consulting company, which show Tiger Woods hitting a shot, with the caption "Go on. Be a Tiger!" At the end of every entrepreneurship idea he discussed, he would mention that it takes guts to become an entrepreneur, that it is not for the weak-hearted, that you need patience and you need to be daring, that in a nutshell, you need to be a tiger. And then he would bring up the slide and say "Go on. Be a Tiger!" It led to some chuckles from the audience but communicated Ato Tekeste's point very well.

Some students felt that it was unfair that the graduate students were also allowed to participate. We initially thought it would make for better competition and more diverse entries, not to mention that the graduate students were done with their term and free at the time of the competition. For future years, it might make sense to divide up the competition between the undergraduate and graduate students.

Additional Activities

Week-long Seminars:

Since our course was only 4 weeks long, we decided to add on an extra week of seminars, which would be open to all AAU students. We picked the topics with a few things in mind. In the course of teaching the students, we had felt they were lacking in certain aspects, such as communication, and motivation to apply for graduate school abroad, so we picked these for seminar topics. In addition, we wanted to talk about technical topics that would be of interest to undergraduate as well as graduate students in the Technology department. Lastly, we thought it would be useful to introduce them to the OCW resources made available by MIT.

Our schedule for the seminar was as follows:

Monday: Bruck, Applying to Graduate School in the US

Tuesday: Jeremy, Using OCW resources

Wednesday: Tawanda, How to build a Spam Filter

Thursday: Saba, An Introduction to Artificial Intelligence: Expert Systems

Friday: Julie, Communication

Part III. Future Recommendations and Problems Encountered

Not very surprisingly, we encountered a hoard of problems in the course of our stay. The more salient ones are summarized below:

- The airport authorities at Addis Ababa did not allow us to take the OCW hard drives into the city. They demanded a deposit of 6000 Birrs. which would be returned to us when we left the country. Bruck's father very generously supplied this sum of money but a lot of bureaucracy was involved and multiple trips to government offices in Addis Ababa were needed to get the projector. Thankfully, we managed to settle the issue before the course began.
- No classroom had been reserved for us to teach in. We had to speak a couple times to Dr. Bayou to get a room that was spacious enough to fit our students.
- The biggest administrative issue was that of a schedule conflict, which we had not been made aware of in advance. The students were having final exams in a few weeks from our arrival date. For this reason we had no choice but to compress the course into four weeks so that we would be able to finish before their exams. This also meant the students had to be committed enough to our course to be able to manage it along with their own course load and approaching finals.
- In past years, the AAU administration had taken care of the student selection process for AITI's course. We were not aware of this policy and attempted to take matters in our hands and select the students ourselves. For one thing, this meant that the selection process was not based on GPA, and we ended up getting students who would need to be mentored more closely. For another thing, this led to widespread discontent among the students because we could only select so many students due to limited resources. We got many emails, phone calls and personal grievances from students requesting to be allowed to take the course. This led to an unpleasant situation where we had to explain our selection criteria and turn very enthusiastic students down.
- Since the course was compressed, it moved much faster than usual. This proved overwhelming for some students. One student decided to quit the course in the middle of a lab session and had to be convinced to stay.

- There was a bit of a language problem, where we would repeatedly explain the same concept to a student but would not get a positive response. If we used a slightly complicated word that the students were not familiar with, they were hesitant in asking what it meant, leading to confusion on both sides. Some students pointedly asked Bruck to explain a concept to them since he could communicate it to them in Amharic. It definitely helped to have Bruck with us!
- Lab space and computers were a constant problem. We barely had enough to fit 13 students in each session. We resorted to asking the graduate students to bring their own laptops and allowing some students to share computers.
- We did not have a designated budget to get gifts for our guest speakers or for the AAU faculty. Neither were we given any funds to purchase gifts or give money prizes to the winners of the entrepreneurship competition. We had to pool in money from our personal stipends for these purposes.

The AITI program needs at least 6 weeks of Monday to Friday, 9-5 teaching. Issues like student schedule, classroom reservations, and lab space need to be discussed in advance and the AAU administration needs to take responsibility for providing these facilities. This can only be done if there is communication with the administration before the AITI team actually arrives in the country. We spoke to the Technology Dean and brought up these issues; he promised that he would try his best to designate a point of contact for AITI in future years.

We also recommend that all AITI teams should review the final reports from the previous year's team, so they are aware of potential problems and ways to solve them.

For the entrepreneurship competition, we recommend involving the Faculty of Management in this activity. Speak to the Dean and poster the competition in the Management building. This will also serve as a much-needed link between the Technology and Management faculties. We also recommend separating the undergraduate and graduate students for the business competition to make it fairer for everyone.

Part IV. Impacts and Benefits

For the students

We initially anticipated that the students at AAU would not participate in the AITI program, because the course overlapped with their final projects and examinations. At MIT, few students would pick up a new class a week before their finals. That 140 students showed up to our introductory session, despite a heavy course load, is testament to the impact AITI has had at AAU in the past.

We discovered that the certificate AITI hands out at the end of the Java course is seen as an important qualification for securing full-time employment in Ethiopia. Many students were desperate to join our class to obtain this certificate. This is both good and bad. On the one hand, the certificate motivates students to put in the required effort in the class. Moreover, as more and more AITI graduates enter into full-time employment, the certificate and the program get increasing visibility within the Ethiopian technology sector. On the flip side, as the certificate gains in importance, students join the program for the wrong motives. Instead of seeking to learn Java, they pursue good grades and project completion, even if this means they have to cheat (as happened in our case).

Despite the issue of certificates, we feel the students still gained an appreciation of the fundamentals of computer science from our class. Many of the students had taken a course in programming (mainly C++ or Fortran), but none in Java. Also, it seems their previous courses focused more on the syntax of the language, as opposed to the underlying computer science principles. Our course was geared to target the principles first, and syntax second, and the students definitely appreciated this approach. More than one student commented that they wished their other computer science courses were like ours. One fourth year computer science student commented that he "felt he now really understood programming" after taking our course. A first year student said that before taking our course he hated computer science, but now he was considering pursuing it as a major.

Students also gained from the fact that we were their peers. In fact, our group comprised three freshmen who were younger than most of the AAU students. The AAU students were impressed that men and women so young could be confident enough in their material and themselves to teach it to older people. In a society where hierarchy is integral and students often lack confidence to express themselves, the students were inspired by our youthfulness and self-assuredness.

The students further gained from our MIT teaching style. We encouraged questions and participation, which is not the norm for their other classes. Initially

the students were very shy and unresponsive. By the end of the course, they had gained in confidence, and were more engaging. We hope that they continue challenging the status quo and allowing their voices to be heard.

Due to time constraints, we only had three entrepreneurship courses. However, these courses probably had the most impact on the students. Our initial lecture was an overview of various business practices. Immediately after the lecture we got very positive feedback. Many students wished that we had more entrepreneurship lectures. Some students lamented that their coursework did not include an entrepreneurship component along the lines of the course we were offering. The guest speakers were particularly inspiring, especially Michael of Afrolink. He frankly discussed his experiences as a young entrepreneur and challenged the students to pursue their business dreams. He encouraged them to dream big, and entertained some business ideas from the students at the end of his discussion. The enthusiasm was visibly evident during his talk.

The business competition was a pleasant surprise. More than twenty people participated, and the ideas were very good. These participants had no previous business-related coursework. They were driven purely by the passion for their ideas.

Overall, judging from the e-mails we have received from many students during and after the course, the AITI experience was unlike any other course the students have taken. They were definitely inspired, empowered and educated by the material and teaching style.

For the MIT instructors and the AITI program

We found the experience in Ethiopia life-changing. We learnt as much from the students as they learnt from us. We will never forget their dogged determination to complete the course, despite having four/five final projects the week of our third problem set, and final exams the day after our last quiz. It's going to be hard for us to complain about MIT after seeing that. Also, we learnt to appreciate many of the things we take for granted at MIT: high speed internet, access to textbooks, cheap, high quality photocopying, large number of public computers and so on.

The entrepreneurship instructors encouraged us to seriously consider self-employment as an option after graduation, and made us dream bigger than we were dreaming before.

Outside of the classroom, we thoroughly enjoyed getting to know each other and formed long lasting friendships that will hopefully last a lifetime. We traveled around a country most of us were unfamiliar with; we learnt a few words in a

new language; and we befriended people of a different culture. We laughed, we cried, we got sick, we had allergies, we were constipated, we argued, we pulled late nights, we roamed the streets of Addis, we haggled with cab drivers, we danced in the local clubs, we drank tej and ate kitfu ...this sort of education cannot be picked up sitting behind a computer at MIT.

And at the end of it all, there was nothing more rewarding than seeing the students learn the basics of computer science and grow in self-confidence and self-belief.

We believe that Ethiopia is an important destination for the AITI program. Nowhere else is the course as popular among students. We were completely taken aback by the students desire to take the course. People called and mailed us daily to try and get in the class, despite our incessant efforts to inform them that the class was full. Clearly, the students at AAU are hungry for the AITI program. We propose increasing the size of the team to Ethiopia in order to meet the incredible demand.

For the AAU instructors

Unfortunately, we were unable to engage the AAU instructors. When we first arrived, the Dean of the technology faculty and the head of electrical engineering and computer science expressed surprise that we were in Ethiopia. They assumed the course would be cancelled due to the changes in the academic calendar. Once they realized we were determined to teach, they offered us little by the way of encouragement. Instead they warned that the students would not take the course. To their surprise, the student turn out was phenomenal. Still, the faculty did not get involved much. None of them attended our lectures or lab sessions. Worse still, they did not fulfill many of their promises such as ensuring we had 18 working computers for our lab sessions.

There were really only two members of staff that were supportive. One was the secretary for the dean of the department. She allowed us to use her computer frequently to print fliers. She also posted fliers on our behalf, and kept our notice board up to date. Without her, we would not have been able to communicate effectively with the students.

The second member of staff who was very excited by our program was Professor Tekalign, dean of the Faculty of Business and Economics. We approached him to adjudicate our entrepreneurship competition. He was enthralled that we were holding a business contest for engineers, and expressed an interesting in extending our program to include some of his students in the future. He seemed very open to the idea of collaborating with AITI in the future. True to his word,

he attended the business competition and offered invaluable advice to us and to the participating students.

The dean of technology, Dr. Bayou, seemed good-natured, but was too preoccupied with the stresses of his position to really entertain the AITI team. We were always unable to get a hold of him, or forced to wait for a long time to see him in his office. We invited him to the final graduation ceremony but he did not attend.

At the end of the program we met with Dr. Bayou and let him know of our concerns regarding the lack of interest from the AAU staff. He apologized profusely and committed to better communication in the future, and more involvement from the AAU side for upcoming projects.

We hope he remains true to his word. The problem is not that the AAU faculty members are disinterested in our project, or ungrateful. They just have too many other concerns to additionally take on the pressures of coordinating a program like AITI. We propose that AAU appoints a junior faculty member, with few other responsibilities, to be the liaison between AAU and the MIT team. Communication between MIT and the liaison should begin early, and the liaison should be responsible for publicizing the program to the AAU students, selecting participants, and ensuring the lab space is reserved and adequate. This liaison should also attend a large number of the courses to learn from our teaching style and material, and also offer us helpful feedback.

Final Words

We are very grateful to the AITI organizing committee for selecting us to participate in this incredible opportunity, and raising the funds to make the trip a reality. AITI changes lives. We saw this first hand. Many students realized that computer science, in addition to being exciting, could empower them and their nation. We realized that we can use our MIT experience and training to inspire others and galvanize change.

Part V. Appendix

Appendix A.

MIT AITI Java and Entrepreneurship Course

Course Overview

This year the AITI team is offering an introductory course in computer science using JAVA programming that will run from July 14 – August 5. The course will cover basic topics in control structures, methods, and object oriented programming. Weekly JAVA labs will reinforce the principles taught in the class.

We are also offering a short entrepreneurship course comprising 3 seminars, which will likely feature young, upcoming Ethiopian entrepreneurs as guest speakers. This course is open to all students, not just those registered for the JAVA portion of our class. The entrepreneurship course ends with an open business competition.

General Requirements

1. All students are expected to arrive to class on time (or earlier, whenever possible).
2. All students are required to complete and submit all assignments including the final exam. If you have a schedule conflict for the final exam, let us know well in advance so we can arrange a make up exam for you. There will not be any make up labs given!!!
3. Lectures are MANDATORY and attendance will be taken!

Collaboration Policy

We, the AITI team, are here to help with any problems you might have. You can come to us personally or send your questions to us at aiti_ethio2006@mit.edu. You are welcome to help each other as long as each student has a complete understanding of the material and writes his/her own code. We will check this at the end of each lab!

The least instance of cheating will result in immediate expulsion from our program and the involved students will be referred to their respective departments.

We consider the following to be cheating:

1. Borrowing/taking/stealing someone's work/ideas and passing them off as your own on assignments and in exams.
2. Sitting in lab/exam for someone else.

Competition for Original Business Ideas.

Competition takes place Saturday August 5th and is open to ALL students. Students in groups of 3 to 5 are asked to submit a 2 to 4 page proposal by Friday August 4th. Students will give brief presentations on their business plan on Saturday and prizes and certificates will be awarded. More details of the proposal will be posted around campus within the month.

Grading

AITI will be run on a Pass/Fail basis. To pass, students are expected to turn in the three completed weekly lab assignments and demonstrate reasonable understanding of the material on the final exam.

- Attendance and participation in lecture is mandatory
- Assignments completed at each weekly lab session count for 25% of the final grade.
- The final exam administered during class on August 4th counts for the remaining 25% of the class.
- If students have a conflict with the final exam time they should contact us immediately.

MIT AITI COURSE SCHEDULE 2006

<p><u>FRI, July 14</u></p> <p>5—6:30PM</p> <p>Lecture 1: Intro to Java</p> <p>Lecture 2: Variables</p>	<p><u>SAT, July 15</u></p> <p><i>Lab 1 & Lab 2: Section 1: 9AM – 12PM Section 2:1PM—4PM Section 5: 4:15PM—7:15PM</i></p>	<p><u>SUN, July 16</u></p> <p><i>Lab 1 & Lab 2: Section 3: 9AM – 12PM Section 4:1PM—4PM</i></p>	<p><u>MON, July 17</u></p> <p>5—6:30PM</p> <p>Lecture 3: Operators</p> <p><i>Lecture 4: Control Structures</i></p>	<p><u>TUES, July 18</u></p>
<p><u>WED, July 19</u></p>	<p><u>THURS, July 20</u></p> <p>5—6:30PM <i>Entrepreneurship Lecture 1 by AITI Team</i></p>	<p><u>FRI, July 21</u></p> <p>5—6:30PM</p> <p>Lecture 5: Arrays</p> <p><i>Lecture 6: Methods</i></p>	<p><u>SAT, July 22</u></p> <p><i>Lab 3 & Lab 4: Section 1: 9AM – 12PM Section 2:1PM—4PM Section 5: 4:15PM—7:15PM</i></p>	<p><u>SUN, July 23</u></p> <p><i>Lab 3 & Lab 4: Section 3: 9AM – 12PM Section 4:1PM—4PM</i></p>
<p><u>MON, July 24</u></p> <p>5—6:30PM <i>Lecture 7&8: Classes and Objects</i></p>	<p><u>TUES, July 25</u></p>	<p><u>WED, July 26</u></p>	<p><u>THURS, July 27</u></p> <p>5—6:30PM <i>Entrepreneurship Lecture 2: Guest Speaker</i></p>	<p><u>FRI, July 28</u></p> <p>5—6:30PM <i>Lecture 9: Lists and Iterators Lecture 10: Modifiers and Packages</i></p>
<p><u>SAT, July 29</u></p> <p><i>Lab 5 & Lab 6: Section 1: 9AM – 12PM Section 2:1PM—4PM Section 5: 4:15PM— 7:15PM</i></p>	<p><u>SUN, July 30</u></p> <p><i>Lab 5 & Lab 6: Section 3: 9AM – 12PM Section 4:1PM—4PM</i></p>	<p><u>MON, July 31</u></p> <p>5—6:30PM</p> <p>Lecture 11: Inheritance</p> <p><i>Lecture 12: Abstract Classes and Interfaces</i></p>	<p><u>TUES, Aug 1</u></p>	<p><u>WED, Aug 2</u></p>

<p><u>THURS, Aug 3</u></p> <p>Entrepreneurship Lecture 3: Guest Speaker</p>	<p><u>FRI, Aug 4</u></p> <p>5—6:30PM</p> <p>Final Exam</p>	<p><u>SAT, Aug 5</u></p> <p>9—1PM</p> <p>Business competition presentations.</p> <p><i>Graduation ceremony.</i></p>		
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Appendix B.

WEEKLY REPORTS

WEEK I: Wednesday, July 5th – Friday, July 14th

Administrative Issues:

In previous years, the AITI java course was restricted to fourth and fifth year students and the ECE department staff selected participants. We happily assumed this year that the course was to be made available to all students in all departments because students are studying for finals and we anticipated less interest. The school lecturers decided not to do the selections this year since they're quite busy with exams, lectures and the greater number of students. As a result, the team encountered a string of problems:

- No classrooms were reserved for us.
- No computer laboratories were available.
- We had no students. Dr Abebe, our only contact at the university, is no longer dean. He had been communicating with Dr Baiu, the new Tech faculty dean, who said he couldn't reply while we were at MIT because of schedule conflicts, and hadn't expected us to come in the end. He seems very indifferent and unhelpful.
- 4th and 5th year students who had been told during previous years that they could not participate in the program were upset by the fact that we chose 23 1st – 3rd year students this year and refused to admit a few 4th and 5th years that had schedule conflicts. The older students wanted us to kick out the younger ones from the class.
- The number of 4th and 5th year students has doubled due to political issues in Ethiopia. It was impossible to admit all of them this time as had been done in previous years.
- We had to leave our hard drives at the airport because, donation or not, we were expected to pay tax. Bruck has been running round the ministry of education and a couple of other ministries all week to get documents that grant us permission to collect them.
- We paid Birr 4000 (\$ 500 approximately, generously lent by Bruck's dad) for our projector at the airport because they thought we might try to sell it. We'll collect the money once we're done and are about to leave for Boston.

So far, we've dealt with the above-mentioned problems pretty well.

- Ato Mubarak and another lecturer showed us round school and helped us post notices to get students. We had a meeting with interested students, who filled out surveys to help us decide on most convenient class times. The turnover was much bigger than we had expected, and we had to turn away many students. We distributed surveys to find out the students' schedules, and selected 72 from among the ones who responded. Selection was based on whether students were available during the most popular time slots. 4th yrs and 5th yrs were given preference.
- After many emails and phone calls from dissatisfied 4th yrs and 5th yrs, we opened up 17 more slots for them and ran a lottery.

- We selected 11 postgraduate students for the program, but only if they had their own laptops. We hadn't admitted them in the first place because we assumed they had enough basic computer knowledge, but they really want to learn java (or get the certificates). Now, we have a total of 100 students.
- We obtained our classroom, which can seat all of our 100 students.
- After a few days of pestering the administration, we were given a lab room, available on Saturdays and Sundays only. The lab has 13 working computers so we are running 5 lab sessions all weekend so all 100 students can do some hands-on Java.
- We have squeezed our course into 4 weeks comprising two 1.5-hour lectures and one 3-hour lab per week (no students were able to handle more than 7 hours per week). The schedule is at the back of this report.
- Bruck and his dad got the required authorization documents for the OCW hard drives on Thursday the 13th, and Bruck finally picked up the drives yesterday.

Academics

We had our first lecture, taught by Jeremy and Bruck, on Friday, July 14th. The first class was great, except the part where Bruck got two phone calls while he was lecturing, got flustered and whammed the projector shut. (We like to think of it as comic relief). We were annoyed that 15 students didn't show up after all the fuss they created to be admitted into the class. We distributed AITI policies, schedule and course notes and covered lectures 1 and 2 in about an hour. The students hardly ask any questions and aren't too confident about their answers, even though they apparently know most of the stuff. But, they look promising!

Lab 1 was a combination of labs 1 and 2, modified by Saba and Tawanda on Saturday the 15th. At this very moment the first group of students is successfully finishing their first java 'project'.

Lab Sessions are running well, but keeping the computers running with reliable network connectivity remains a constant challenge.

Discovering Habeshaland

Jeremy, Tawanda, Bruck and Julie arrived in Addis Ababa the night of July 6th and faced disappointment # 1 at the customs office with the hard drives and projector. A few hours later we got over the episode once we saw our house: 3 bedrooms, 5 beds, warm water, phone, cool lounge, TV with satellite...

Disappointment #2 came on Friday when we were told we had no students, no labs, no one knew we were coming, etc. Then we went touring Addis with Bruck's dad and were introduced to the food [injara, firir], a few words of Amharic, and his family. Hany, Bruck's 4-year old baby brother is fascinated by Jeremy's hair, snakes and Home Alone III. We're all addicted to him now! On Saturday, we went to an Ethiopian restaurant and a couple of banks. Life is quite cheap here and tourists are unfortunately very conspicuous. Internet is really cheap but incredibly slow!

On Sunday we visited the Sheraton where we found more tourists and faster Internet. We visited Lucy at the National Museum, got stalked by a sketchy dude along Meskel square (huge square in Addis with a giant screen for football matches). Yea! And bloody Italy won and bloody Zizou messed us bad!

Meanwhile, Saba, minister of Fun & Games, arrived on Tuesday at 2am. The next day we went to 'Burger Queen' and to the 'Lion Zoo' to see the descendants of Haile Selassie's royal entourage of lions. These days, our favorite eating-place is 'Blue Tops', an expensive place right down the street from AAU, frequented by many tourists.

In terms of traveling outside Addis, we have been advised to be cautious not to venture too close to the Somalian, Sudanese or Eritrean borders. For this Tuesday and Wednesday (our 2 holidays for the week), we are planning a trip to the Great Rift Valley to climb hills. Bruck is arranging transport. We also plan to visit the Blue Nile Falls, the Omo tribes in the South, and Bale National Park in the southwest. Can't wait for Tuesday!!!!

WEEK II: Monday July 17th – Sunday July 23rd 2006.

Outstanding Issues:

- Some students didn't show up to the first lab and gave some really interesting excuses like not seeing the date of our first lecture, etc.
- One of our lab groups is "in danger"... They took a really long time to do the first 2 labs although they had sort of improved on their speed by the second one.
- Many students did not finish their second lab. A few complained about it being too hard and too long.
- Some grad students showed up at the first lab without laptops and occupied the undergrads' computers.
- We still have only 13 working computers, with some power and server problems at 7pm on Saturdays.
- Students do not follow the written instructions in the lab handouts. We need to repeat the same instructions multiple times. Initially, students also hesitated to ask for help, even if they were stuck. They are becoming more comfortable with us as the weeks go by.
- We have noticed that our students fall into one of three categories:
 - Students who have programmed before in C++ or some other language, and who finish the labs well within the allocated time, and sometimes much earlier.
 - Students who have not programmed before, but who can think logically, so are just able to finish the lab.
 - Students who are very lost. They still cannot declare variables, or write loops, despite multiple attempts to teach them this material.

We have added extra credit questions to our labs to cater to the first group of students. We have about 10 students who fall into the last category. We are not sure what to do with them. The pace of the class may just be too fast for them, especially since we are teaching a highly compressed version of the AITI syllabus. We are considering holding special office hours for very slow students.

To deal with the problems above, we did the following:

- The students had to do lab 1 before being admitted into the second lab sessions. The case of 2 first year students who claim not to have seen the day of our first lecture posted on the board is still being studied. However, if they don't catch up soon, they'll be kicked out. They have more opportunities later on to participate in AITI.

- We will go over the labs in our lecture on Monday and discuss common mistakes.
- We realized that the written lab instructions could never be too explicit. Most students seem to require a step-by-step breakdown of the question before they can even start attempting it. We will break down the next lab into easier, clearer steps that the students can understand.
- We will hand out typed short questions in class aimed at helping them understanding lecture concepts.
- We put up all our lectures on the AAU public folders so that those who did not receive soft copies could access them.

Saturdays and Sundays are very tiring for us. We run lab sessions from 9AM-7:30PM on Saturdays, and from 9AM-4PM on Sundays.

Lectures:

Julie & Saba gave lectures 3 & 4 on Monday, dealing with Operators and Control Structures. The students love Julie's enthusiasm and interesting examples. Quote from Julie's entrepreneurship lecture: "We want you guys to think of useful ideas. If there was a machine that went to Mars, discovered some aliens and came back, how useful would that be?"

Our first Entrepreneurship lectures were on Thursday and covered the following topics:

Introduction (Bruck)

- What is entrepreneurship?
- Why entrepreneurship is important for Ethiopia, Africa

Developing a business (Jeremy)

- Innovation
- Financing

The Market (Julie)

- Understanding your market and competitors
- Marketing Strategies

Articulating your business idea (Saba)

- Writing business proposals
- The importance of communication

Outsourcing and Offshoring (Tawanda)

- Successful Models (India)
- Applying the model to Africa

The responses to our Entrepreneurship lectures were amazingly positive and the students requested more lectures like that. Next Thursday (Tawanda's birthday, by the way), we're going to have a guest speaker (the CEO) from CyberSoft, a software company among the best in Addis.

On Friday, Tawanda & Jeremy gave lectures on Arrays & Methods respectively, with the help of our mascot, the Purple Monster (whose picture we might include after our stay here). Students still don't ask too many questions, whether they understand or not.

Wondo Genet...Here We Come!!!

So last Tuesday, we hired a cool driver who was the brother to a friend of a friend of a friend of Bruck's mum's friend. We visited Lake Langano resort and saw hippos!!! (And chilled with baboons and horses and cows and cacti and a hare)... and spelt AITI and MIT out in the lake... We slept at a really cool cheap hotel. On day 2, we took a trip to the Wondo Genet hot springs (really burning! Looks like people usually boiled their eggs in the water from the random eggshells we saw at the source. A few seconds after visiting the source, we hiked up the mountain behind the spring and realized just how little exercise we'd been having in the past few weeks: we were panting every other minute! Our guide on the contrary was sprinting up like he was born running. Luckily for us, the view from up (except the weird insects flying about) was worth the air shortages.

We had lunch there then we drove for an hour and a half deep into a village where all the kids kept on waving and screaming "You! You!" as we passed by and naughty donkeys refused to leave the road. After several road bumps, we were led through cacti and volcanic rocks to lake Shala which was just amazing. It had 3000 flamingoes and pelicans or more and the most amazing scenery ever with the green hills on one side, the volcanoes on the other, and the sun at one angle... Again, we took loads of pictures but we're not too sure which to send yet so we'll just wait till the end or till when we get back. Our next trip is going to be a one-day trip to some pre-historic sites. Or we might simply go... P-A-R-T-A-Y!!!!!!!!!!!!!!!

WEEK III: Monday July 24th – Sunday July 30th 2006.

Outstanding Issues:

- Lab II was apparently quite hard on some students. At the end of our last lab session, a couple of students asked Bruck to inform us that it had been awfully long and hard and it'll be good to have a shorter one next time. Unfortunately this is kind of impossible, especially since we're trying to teach them as much as we can in the space of the 4 weeks available. So we will allow them more time to finish it instead.
- We had our first guest lecturer from CyberSoft, Ato Tekeste, who gave a quite long but interesting talk. We'd say his outstanding message on entrepreneurship was "Go on! Be a tiger!" like Woods...
- Eclipse is not quite available to everyone in our class during the students' spare time because they don't belong to the EECS department. Eclipse was installed on EECS 4th year computers only.
- We have a couple of students who were not admitted into the class who still keep on coming. If they finish the assignments satisfactorily, we might give them certificates anyway.

To help solve problems mentioned earlier, we did a few things:

- Saba & Tawanda came up with the idea of the tutorial mentioned in last week's review which proved quite helpful. So we continued the practice for our next few lectures.
- Jeremy wrote a list of problem kids and asked them to meet us. Problem kids include those who've been skipping lectures, haven't submitted labs or are doing poorly in them. We asked those who hadn't submitted labs due to server problems or other issues to email them to us and try to upload them to the server. Those who'd been skipping lecture were warned one last time. Jeremy and Bruck redid the whole lab with a student who'd had one of the worst grades in the exercise.
- We put up lab 3 on the server earlier than usual so students had more time to look at it, with a reference sheet with ArrayList methods and useful information. We also extended

the due date for the lab by almost a week, so they had 6 to 7 days to work on it. This was done keeping in mind the complaints from the last lab, their upcoming final exams, and the length of the 3rd lab.

Academics:

On Monday Bruck and Julie gave lectures 7 and 8 on classes and objects I and II. They had a brief tutorial on the previous week's lectures, led by Tawanda. On Thursday, we had Ato Tekeste's lecture about entrepreneurship and CyberSoft. We bought him a thank you card that we will post to his office address. The next day Saba and Tawanda lectured on ArrayLists and Scope & Modifiers. Julie took care of that tutorial session.

The next day we realized during lab that most people hadn't looked at the lab before coming, as we'd requested. But it went on considerably better this time and they seemed to understand a lot more. We're still waiting for their final submissions on Thursday.

We Saw More Hippos!!!

Ya...this time three of them from much closer on Lake Ziway. Julie and Tawanda tested their rowing skills on the tiny boats... and Julie just missed making everyone sink.

We also went to visit a few prehistoric sites, notably Melka Kunture, with a remarkable collection of stone tools from the time of the Homo erectus. A five-minute walk through deep mud took us to a site currently under excavation, where animal bones and tools could be clearly seen. After this, we went to the rock-hewn church of Adadi Maryam, believed to date from the 12th century. It still looked quite functional, and we met a team of Ethiopian showbiz people shooting an Amharic video inside. Then we visited the town of Tiya, a UN heritage site, containing about 40 ancient stelae, the largest up to 2 meters high. Almost nothing is known about the carvers of these stelae but our guide related some interesting interpretations of the carvings on the stones. This time Bruck didn't come with us and we had to deal with our Amharic-speaking driver on our own! We listened to the same Ethiopian tape the entire way there and back. Aster, the latest Ethiopian music diva, sings like a fire-brigade but the tunes are catchy and we sang along even though we didn't understand a word.

Thursday was Tawanda's birthday. We surprised him with a chocolate birthday cake for breakfast, and had dinner at a local Rastafarian restaurant. At school, the students sang him happy birthday. Later in the night, we took him to a lounge where the DJ put on all the birthday songs he had in his collection. On Saturday, we finally went clubbing for the first time since we came to Addis. We actually ran into one of our students at one of the clubs. We also got to see the traditional Ethiopian shoulder-dancing, and chilled with some of Bruck's Ethiopian friends. Sadly, we had to break up at 1AM because of early morning lab on Sunday. This will be the last of our lab sessions. Looking forward to sleeping in late next Sunday ☺

WEEK IV: Monday July 31st – Sunday August 6th 2006.

Outstanding Issues:

-Lab III: Although our third lab session appeared to be running smoothly, more than half of the class copied and pasted other people's code. The students are far more interested in the certificate than in the class. Even though we'd helped them earlier on during lab, they readily wiped off all their code, probably because it didn't run, and replaced it with friends' running code, and in some extreme cases, stolen running code. Consequently, on Friday, after their exam

Tawanda, Jeremy & Bruck spoke to them about the cheating. It was impossible to track down every single cheat so to be as fair as possible, we simply graded the lab like they hadn't cheated at all and made the lab worth 10% (as opposed to the 25% it was worth earlier) and the quiz to be worth 40%. We did not expel the students because more than half the class was involved. Also, we realized that the students were under a lot of pressure with final exams and so on, and they might have felt that cheating was the only way for them to finish the lab.

In general, we noticed that most students were primarily motivated by the certificates. To avoid this, we're suggesting that future groups inform the students that there are no certificates awarded at the end of the course, or that the certificates become certificates of completion and not certificates of excellence.

Monetary Issues: We had two guest speakers over the past two weeks, as mentioned earlier. But when the speakers were done helping us, we felt really bad because we had no MIT gifts or cards to give them. We did end up buying cards for both of them, but we'd really appreciate it if MIT-AITI could, in general, set aside some money for these occasions. Although they did agree to help us for free, we feel we should try to reward them with some MIT memorabilia. If money isn't set aside for these things, please remind the next teams to try to get a few MIT gadgets before coming, if they can.

In addition, we had problems coming up with prizes for the entrepreneurship competition. We wanted it to be a monetary prize for the top three ideas, but there was no AITI budget set aside for this so we ended up chipping in a total of 1500 birr from our stipends.

-Fly Ethiopian next time. If you fly Ethiopian internationally, then you get large discounts on the domestic routes as well.

Academics

This was by far our busiest week. On Sunday evening and Monday morning, we wrote a practice quiz to give to the students. On Monday afternoon, Bruck and Saba delivered our final lectures, on inheritance and interfaces and abstract classes respectively. The last lecture was quite emotional; one of the students got up, and began talking furiously in Amharic, apparently organizing a surprise for us, while the rest of the students applauded and cheered.

On Wednesday evening, we worked on our final quiz. We wanted the quiz to accurately reflect the students' mastery of java. The first five sections of the quiz (constituting 55%) of the quiz consisted of short answers, and true false questions. We designed the questions, so that if a student knew the basics of java, s/he should at least be able to ace the first sections. The last three questions required more thought. One question asked the students to reverse an array, the next question asked the students to implement a child class, and the final question asked the students to use an ArrayList and the random class to randomly permute the contents of an ArrayList.

On Thursday, Michael Mahdere, marketing manager of Afrolink, gave an inspiring talk on his experiences as an entrepreneur. Michael touched on the risks of his business, the tricks of successful marketing. Even more inspiring, was the question and answer section after his talk. Michael asked the students for entrepreneurship ideas. He encouraged them to venture into small business. The talk went over slightly, but the students did not seem to mind.

On Thursday, we also got a chance to meet the dean of the business school at AAU, and invited him to be a guest judge for our business competition.

On Thursday evening, we graded lab 3. We were appalled to find that many students had copied code. We found this very disappointing, and were not to sure how to handle the situation. In the end, we decided to confront the students who had cheated on Friday, and hear their side of the story.

We administered the final exam on Friday. We were glad to find that only 4 students finished the exam within 1 hour. The remainder of the students needed the full 1.5 hours to complete the exam. We added an extra credit question, to keep the good students occupied. After the exam, we confronted the students with the news of the rampant cheating. Most students admitted to having worked together on code. Some students even admitted cheating: copying the code of other students from the server.

On Friday night, we graded the exam, until about 3:00 am. We found that the average of the quiz was about 64% with a standard deviation of 20%. In light of the cheating in lab, we decided to use the quiz as the main determinant of whether or not a student failed the class. We failed any student who obtained a grade below 40% in the quiz. We also failed a few students with 41.5% on a case by case basis. In the end, we failed about 14 students. It was not easy to do this, but we felt that the

14 students had not shown sufficient mastery of Java.

On Friday night, we also skimmed through the 11 business proposals we received on Friday afternoon.

On Saturday morning, we headed out early to AAU to inform the students who would be getting certificate. Informing students that they had failed the class turned out to be an emotional task.

At 10:40 am, the dean of the Business school, Dr. Teklu arrived, and we launched our business competition.

We had 11 participants in our business competition. Each participant was given 5-7 minutes to present their business ideas. The ideas were incredible. These students never cease to amaze us. They are in the middle of finals, and yet they put so much effort into our class.

The talks last almost 1.5 hours. We then recessed, and discussed the best business ideas with Dr. Teklu. Eventually, we awarded first place (800 Birr) to Biniam Tadele, who presented a novel ethanol based gel that made use of molasses to provide energy. Second place went to FAdverts, a flash-based advertising idea. Third prize was awarded to Microwave injera - a group that described the design of a microwave for preparing the Ethiopian national food, injera.

At 2pm, we graduated our students. This was a lot of fun. First, we awarded certificates to 12 students who had achieved more than 90% in the final exam. Then we handed out the remainder of the certificates. The students were visible overjoyed. After we had finished distributing certificates, the students surprised us with a large cake, and then gave each one of us gifts, consisting of a tradition ethiopian shirt, and some beads. We then ate, danced and laughed with the students. It felt great connecting with the students beyond Java and Entrepreneurship. We really fell in love with them.

The rest of the week (Sunday), we just crashed after an exhausting few days.

Habesha Kameez...

We decided we were going to wear Ethiopian clothing to school for our graduation. So on Wednesday the guys went to a shopping center and dressed up in white kameez but bought blue and white ones instead! (By the way! We didn't go out of Addis this weekend, so to compensate, we have attached pictures of the guys in traditional Ethiopian clothing... >=)) Bruck's sister came along with the girls to go shopping (as usual), but didn't find anything they wanted (as usual). On the same day we decided to go watch an Ethiopian movie at the theater for the first time. En route, the girls got hijacked by a van of Saudis. No kidding. Somewhere along Bole road, they heard someone shout "Bole bole bole" & got into the cab assuming it was a commercial minibus going to the theater. It turned out to be a bus hired by 5 Saudi Arabians who felt like screaming "Bole bole" just to imitate the usual minivan drivers. They looked really sketchy & repeatedly asked for the girls' phone numbers and email addresses. The girls were able to stave off their advances but reached the theater quite late. The guys still don't believe this story.

On Thursday and Friday, we graded the lab & the quizzes. The girls couldn't make it to the quiz because they had gone to get their hair braided. But they helped a lot with the grading ☺!

Graduation was one of the most memorable and festive days of our stay here. The students were overjoyed to be graduating with our course. The handing out of certificates was accompanied by loud cheering and clapping, the intensity of which was directly proportional to the popularity of the student receiving the certificate. The students had an elaborate surprise planned out for us, put together by what they called the 'graduating committee'. They had brought a huge cake with the words "Thank you MIT AITI" on it. We cut the cake together and hand-fed it to some of the students. The students made short speeches about how delighted they were to have been given the opportunity to take this course. One of the graduate students ended his speech with "You guys are lovely!" They also bought us these beautiful traditional Ethiopian shirts, bracelets and scarves. This was followed by a dance session, where the students showed us how to do the infamous Ethiopian shoulder dance. We took loads of pictures, had loads of fun and ended up not clubbing because we were so exhausted! Oh well... Bruck's birthday is coming up so we will party then. Next week, some of us are going up North to the Blue Nile and Gondor.

WEEK V: Monday August 7th – Sunday August 13th 2006.

Outstanding Issues

We received an informative e-mail from a former Ethiopia AITI participant, Eric Mibuari. Eric pointed out that traditionally, the Ethiopia program has been marred by problems with logistics and communication between MIT and the faculty at AAU. Eric proposed that we hold a meeting with the deans of AAU to involve them more in the program.

To that end, we held a meeting with the dean of the Faculty of Technology, Dr. Bayou on Friday. Initially, we also invited the dean of the faculty of business and economics and the head of electrical engineering and computer science, but both were unable to attend.

The meeting with Dr. Bayou went well. We first explained to him how we conducted the AITI program this year. We told him that, despite the calendar issues at the start, we were still able to teach the bulk of the Java and entrepreneurship syllabi, and the students dedicated themselves to the program, despite their heavy course load. Dr. Bayou was impressed by our tenacity. He

admitted that he initially thought the program would have to be cancelled this year, and was happy we persevered.

We then told Dr. Bayou how the AITI program is supposed to be run - a full six weeks of class, from 9 - 5pm. We pointed out that each student should have access to a computer during lab time, in order to fully grasp the programming concepts. Again, Dr. Bayou apologized profusely for not being able to furnish us with the necessary resources this year. He was unable to say whether next year would be any better, since the university does not know the schedule yet.

We also raised the problems we had with student selection. In previous years, AAU had selected the participants for the AITI program, based on year, major and academic standing. This year, we selected students using different criteria, which led to many complaints. We asked Dr. Bayou if in the future AAU can handle the selection of students.

We ended by asking for his feedback on the program. In general he was very happy with what we had done. He was particularly excited about the entrepreneurship portion of our course as it provided the engineering students with a different educational perspective.

The meeting ended with the exchange of contact information, and promises from Dr. Bayou for better communication in the future.

Academics

This week, we were done with our course but decided to do seminars all week which were open to all AAU students. The schedule looked like this:

Monday: Bruck, Applying to Graduate School in the US

Tuesday: Jeremy, Using OCW resources

Wednesday: Tawanda, How to build a Spam Filter

Thursday: Saba, An Introduction to Artificial Intelligence: Expert Systems

Friday: Julie, Communication

Attendance was quite high, especially by Wednesday, when most students had finished their finals.

Fun Activities

This week, we did not travel. We spent most of the week preparing for our individual seminars, by going to the internet cafes to do research. On Friday, we celebrated Bruck's birthday. We surprised him, by showing up at his house with a cake and balloons. His mother made dinner for us.

On Saturday morning, three of us (Jeremy, Saba and Tawanda) set out for a five-day trip to the North of Ethiopia. We first flew to Bahir Dar, where we saw the Blue Nile Falls. In the city, we ran into a student from Bahir Dar University who had met Jamal and co. when they went to Bahir Dar two years ago. The student was thrilled to meet the new MIT AITI team, and showed us around the city. Tawanda thrashed Saba in a game of foosball, and earned 10 bir for his efforts.

The next day, we took a minibus to Gondar. We spent four days in Gondar. On the first day, we walked around the town and made friends with some of the local kids. On the second day, we

saw the beautiful castles in the grand enclosure, Fasil's bath, and Debre Selassie church. In the afternoon, we visited a local circus of child gymnasts. On the third day, we went to Kosaye, to look at the Simien mountains and surrounding landscape, and in the afternoon went on a tour of a local brewery (Dashen brewery). On the final day, we hung out with the local kids playing pingpong, and riding motorbikes. Again, Tawanda thrashed Saba, this time in pingpong. Unfortunately, there was no remuneration for his efforts this time, because he was too chicken to make a bet before the game started.

We are currently preparing for our departure for Boston. We loved our time in Ethiopia. Thank you MIT-AITI for making this incredible experience possible.

Appendix C.

AITI Instructor Information

- Bruck Assefa, brucka@mit.edu, Sophomore, Economics and Management, Ethiopia
- Jeremy Franklin, jeremyf@mit.edu, Sophomore, Mechanical Engineering, USA
- Saba Gul, saba@mit.edu, Alumna, EECS, Pakistan
- Julie Laure Maison, mjklaure@mit.edu, Sophomore, EE and Economics, Cameroon
- Tawanda Sibanda, tawanda@mit.edu, Alumnus, EECS, Zimbabwe