

Weekly Report: July 12- July 18

1 AITI Java and Entrepreneurship Course Summary

Overall, teaching the AITI Java and Entrepreneurship course has been a truly rewarding experience. It is definitely something that we can not put into words. Thus, we would like to thank MIT-AITI for this incredible opportunity.

This week we spent some time gathering feedback from OCW students in both tracks and compiled a "lessons learned" report (see website). We also had lunch with our faculty contact Professor Aryeetey on Friday. The goal of the lunch meeting was to update him on the course and to get suggestions for delivering certificates. We proposed a university wide information session on OCW to the Professor. We created an invitation to the University of Ghana faculty (see website) and submitted it to Professor Aryeetey. The Professor then sent out the invitation to the general faculty and staff at University of Ghana, Legon. We have schedule the OCW session for some time early next week.

The report detailed below contains information related to teaching throughout the week of July 12- July 18. Since then some proposed ideas have changed.

2 Java Course

While splitting the class into two tracks has allowed us to connect better with the students, it has been quite a challenge managing our time and tasks. This week's lectures for both standard and advanced tracks required a lot of lab access. However, in the main computer lab there are not enough machines for students in both tracks to use at the same time, thus, it was very difficult to manage lab time. More specifically, the standard track was going through the Swing material and the advanced track was going through the JSP material. Both topics are taught well if the students are working on the computer while and listening to the lecture.

2.1 Organization and Logistics

At the beginning of the course, we had students fill out biography forms. You can see these forms on our Ghana 2004 course materials website. We also took pictures of the students, so that it was easier to learn their names as soon as possible. We had Ato go through some of the names with us, so that we could get the pronunciations correct.

We used the information from the student biographies to prepare a grade book for the students. We record all of their grades including labs, exams, quizzes, entrepreneurship assignments in an excel sheet. This helps us to keep everything organized. We also have which computers they work at recorded so that we can go on their computers and grade their labs after class, and know which folders to look for. We try to provide the students with daily agendas, by projecting the agenda prior to the lecture.

We have given report cards to all of the students with all of their grades twice so far – once after the 2nd week, and once after the 4th week. This helps us to let the students know what grades we have recorded for them, and what they need to do in order to pass the course. Many times there are errors in the grades we have recorded (because we could not find a lab that they were working on the grade, for example). It is also a good way to tell the students what grades they should be getting to get a certificate and what grades they should be worried about.

2.2 Advanced Track

The JSP track spent the week wrapping up the Java curriculum in preparation for the final Java exam. The exam was administered on Friday and the students performed very well on it.

We also held the first three lectures of the JSP curriculum. This went well but the students could not write JSP code because we had some problems getting the software to work on the machines. We will be spending the whole of this last week guiding the students through their final project, which is a JSP application that uses a MySQL database. There were a few challenges that we faced. This was mainly preparing the machines in the computer lab with the JSP software. The installation process is detailed Section 2.6.

Results from Exam 2

We allow 1 page cheat sheets for the exams. We decided to implement this idea when we offered the standard track the exam makeup for exam 1. We thought that it would help them to study for the exam, and that it would be more reasonable because programmers can always look up syntax when programming.

The average on the exam was 75.5 – we were extremely happy with that. The grades ranged from 55-95, which was to be expected, considering we had the students with scores below the 60 or 50 range move to the Standard track.

Re-introducing Self Learning

The final project for the JSP class includes the java SPA lab, which requires the Collections lectures 1 and 2. We decided to try another self-learning initiative because we would like to give the students the opportunity, experience, and confidence to learn on their own, so that their Java knowledge does not end when we go back to the US. So we have put the SPA lab on their machines, with the API, and we have textbooks available for them, and we are available for them, and we hope that they will learn the material mostly on their own – or at least they will be responsible for asking questions of us, their neighbors, or looking up information in books or the API. We explained that this is why we are not teaching the lectures to them like we have done before, and they seemed to understand the importance of accomplishing such a task (learning the material on their own). Sam will briefly go through the classes with them, but we hope to leave the majority of the learning to them. We also wanted them to get used to programming for a due date. We don't give them specific time to just work on Collections, but they have been having a couple of hours of free time in between exams and exam reviews, lunch, weekends, etc and we told them that it is their responsibility to finish the project by Wednesday at 5pm.

2.3 Standard Track

The standard track has been doing the lecture, lab, review lab routine for the past week, and it seems to be working well. The class has become much more interactive now that we lecture in a lecture hall without computers. We have found that having them work on sample questions at their chairs and in groups really gets them excited about the material, and really pushes them to understand what they are doing. The lectures tend to go much more slowly than they had before, which is what we expected. There is huge improvement in about half the class. They are really eager to understand the material, and now that they see we are focusing on them and putting a lot of effort into them, they are trying hard to work with us.

30 Minute Quiz Results

The standard track was given a quiz on Friday morning, so that it could be graded and discussed by Friday afternoon, when we would have an exam review for their Monday exam. They performed extremely well on quiz 3. The average grade was 8/10. The average on the other quizzes was usually much lower. We suspected 2 pairs of students (4 student's total) of cheating because their quiz answers were completely identical (and they sit near one another, and we have seen them look onto each other's papers before). We discussed the situation as a team, and decided that the 4 students who were caught cheating would have 10% of their final grade (the amount allotted for quiz results) set to 0%. We had Ato address the entire class (JSP and standard track) and explain that this is a serious situation, and cheating counts both ways – letting someone cheat and cheating yourself. We said the same disciplinary actions would happen if we realized they were cheating on another part of the course – for example, cheating on the exam would set 40% of their grade (the amount allotted for exams) to 0%. We then handed out the quizzes, with 0's on the tops of the 4 we suspected. All 4 came to speak with us after. Two students claimed they studied together and were very upset by the situation. The other pair – it was obvious that one cheated from the other, and the one who cheated made no argument, while the one who was cheated off of said he tried to hide it from the other boy. Again, we discussed as a team, and decided to reset the grades of 3 of the 4 students who made arguments to us back to their original grades. We still think they cheated, but our main goal was to make sure it does not happen again, and we think the class has really gotten the point that cheating is unacceptable in this class. Our advice to future AITI teams: make it extremely clear that cheating is unacceptable right from the beginning. We did include a statement in our syllabus and mentioned it at the beginning of the course, but we should have reminded the students a bit more often.

2.5 Final Projects

This week we had several discussions about what exactly the final project should be for both the advanced and the standard track.

Advanced Track

The JSP project for the JSP track will be worked on in pairs. We wanted to give them the benefit of learning to work in teams. We also thought this would lighten their load for the final week a bit because we want to make sure we get through all of the JSP lectures, and have them finish the Java lab. They will create a website that will have certain requirements that we will decide by Monday. You can find the handout that we are giving them on guidelines for their final project on our course website.

Standard Track

The standard track's final project will be the Collections labs – they will be asked to complete the SPA game. We will be actually lecturing the collections lectures to that class. We have realized that they would not benefit from attempting to learn the material on their own because they have very much trouble even grasping the most basic concepts that we have been going over for the past 5 weeks. We decided this would be the best choice for them because it would expose them to the Java API, as well as a number of classes, so they could get used to reading other people's code.

2.6 JSP Software Installation

Installing the JSP software on the machines was a bit tricky because the machines are not fully networked, and also because the CD drives on most of the machines were faulty. We first installed Netbeans to run JSP code. However, this did not work well with some of the machines and we had to reinstall tomcat on its own and have the students use JCreator to write the JSP code.

The network in the lab has been unpredictable over the course of our stay here and we would advise next year's team to start copying the files required for the JSP curriculum into the machines early enough.

3 Course Evaluations

On Thursday, we handed out an evaluation to the class about how they felt about the split into the JSP (advanced) track and the standard track. We also wanted to know more specifically how they felt about the entrepreneurship class. We also wanted to see if they would be interested in a class get-together ☺ . You can view the evaluation (Form 2) on the Ghana 2004 AITI course materials site

http://web.mit.edu/aisha/www/Ghana/Ghana2004_Weekly_Reports.html

We list the topics from the evaluation below along with a summary of the responses.

Thoughts and Suggestions on the Java Course After it was Split into Two Tracks

Overall, the students seemed very happy with the split-up. Many of them said they wished that it had been that way from the beginning. Others said that it showed great initiative from the teachers to work hard to meet all of the students' needs. Students who are now in the JSP track said they were frustrated with hearing the same questions over and over. Students who used to be in the OCW track said they wish they had lectures from the beginning. Many students appreciate that there is much more interaction with the teachers now that the class sizes are smaller.

Many students are saying that the JSP track might be a bit too fast, and that we are expecting too much of them: "we are normal people too," says one student. We explained to the JSP students that we really want them to work hard this final week to draw everything together. This discussion just happened at the end of Friday, and they seemed understanding. We will see if they continue to complain about the workload next week.

Entrepreneurship Assignments

Students tended not to like group assignments. They said they could not find groups. Some did not think the assignments/class were related to Ghana enough.

Entrepreneurship Guest Speakers

Students really appreciated the guest speakers. It was good for them to see how successful entrepreneurs put the theory into practice. They appreciated our efforts to get them to come speak with the class.

Entrepreneurship Lectures

Students seemed to think they were simple and to the point. Some thought they were monotonous and very self-explanatory. Others thought they were interesting.

Additional Comments

The students love us ☺ and are very thankful that we are spending our summer "tirelessly" imparting knowledge on them. They seem to really feel that they have gained a tremendous amount from the course. God should bless us, according to more than half of the class!

4 Entrepreneurship Course (written with a lil' pigeon slang by Ato)

Chale, we received the final drafts of the business plans on Monday. Are you peeps thurr? We set the deadline this late (this day) to enable the students to find time to do some research (okay) and find time and resources to make digital copies of their plans. It is not a walk in the park to get stuff typed in this

country, as unfortunate as it is, so many of the assignments handed in are handwritten. I mean, what is we gon' do?

We hope to grade their business plans by the start of Tuesday. This would be done by all 5 of us. We created a score sheet / grading scheme, which detailed below. Six business plans which we feel address the issues and objectives of a viable business plan would be short listed. These plans would be presented to 3 entrepreneurs and businessmen for further understudy and grading. These six plans are gonna be sent to Eston for him to contribute his quota. We hope to receive final feedback and grades by the end of Thursday after which we would adjudge the winner who would receive the 3 million cedi prize. We can close the pipeline on that on Friday!

Entrepreneurship business plans score sheet

Business plan

Formatting, clear cut divisions

- Out of 10

Business summary

- Out of 10 (page specific)

Market Analysis (5 each)

- Is that all the market?
- Enough research?
- Entering and expansion
- Value creation
- Competition

Biz team (5 each)

- Who is the team?
- What is the team?
- Previous successes
- Cohesiveness

Strategy Information (5 each)

- How will customer realize value?
- Reach and keep customers?
- Coupons, discounts, customer benefits
- Worker/product competition

Product Overview (5 each)

- Detailed product/ prototype
- Customer use
- Production

Financial information (5 each)

- Budget is detailed
- Are the numbers reasonable?
- Explains how much money is needed to start and when they expect to reach profitability.

Venture viability (15)

Full marks: 130

We've a week more to go to Togo! We're doing well rite hurr!!! Score!!!! Okkaaayyy!!!!

PS: greetings to y'all, Akwaaba from Ghana (oohooo), God bless! Prrrrrrrrr.....

5 Awarding Certificates

The students are very interested in getting certificates at the end of the class. Some of them are only concerned with the certificate. We were only planning to give certificates to students who have an average above a 50% or 60%, leaving about a third of the class without the certificates. We had lunch with the professor who has been dealing with much of the administrative work for the class (Professor Aryeetey – head of Computer Science department at University of Lego). We told him our plans about the certificates, and he suggested that we give the students who did not pass certificates that just say they participated in the program. We thought that was a great idea, and decided not to tell them that yet. We will just make it a nice treat at the end of the class, but we don't want students to stop trying because they know everyone will get a certificate. Let us know ASAP if this is not okay.

6 Mindstorms

This week we brought changes to the course that made a change for the better. As promised in the last week's report, we took back the sets from the Accra Girls teams (who quit), and then got to work on making the atmosphere more fun and competitive.

On Monday we held a talk to the students about what the class is trying to achieve and what changes we want to make in order to meet those goals. Here are some of the major points covered in the talk:

- The class set out to teach fundamental theory about constructing robots, including some basics in mechanical engineering, computer science, and electrical engineering. We hoped to drive home the point by allowing students to build their own robots with legos. This way, they would have a chance to understand what it takes to build a successful robot, and they would also remember their theory lessons better (with practical application). Although the students had now learnt some theory in mechanical engineering (gearing, specifically), they were woefully behind in understanding how to build good robots. Dead-reckoning robots and poor structures abounded because enough time/effort was not invested in building. Our conclusion was that the theory could wait for the future, and it was now much more important to leave the students with an idea of how to design/build successful robots without complicated theory.
- Dead-reckoning robots are no longer allowed. Robots will be assessed based on how well they can react to unexpected changes to circumstances (hence they need sensors), how eloquently they perform their task, and other standards like structural strength.
- The school spirit did not drive any team to success, even though we expected it to. Now, we choose to increase competitiveness in some radical ways:
 - o We usually bring a box of juice containers for free refreshment. This time, the box would not be distributed evenly but all the juice would go to the winning team.
 - o MIT will be represented, to showcase some experienced design work. We the teachers will take back one of the sets from the Accra Girls, and build with it. To ensure students take us seriously, we will compete for our own prizes each time a competition is run.
 - o Competitions will be held daily. This means that there is very little time to build the robots (3 hours), and all team members must work seriously to get the job done on time. There will be no time to play games or do homework.
- Playing games and doing homework is not allowed.

- We will stop assigning homework. The class is taking up 6 hours of students' time each week, so any kind of extra work is completely optional. We now expect all teams to start and complete their robot during class time. This implies that class time must be well spent.

On Monday, we hadn't yet received the legos from the Accra Girls (despite promises...) so we didn't yet get an MIT team to represent. However, the talk accomplished several changes. For example, students were more active in building their robot, and the robots were of higher quality than any previous ones.

The best point in Monday's class was the competition we held at the end. It was then that the competitive character finally rose among teams, and we felt like it could have a huge effect on their future building. Teams began cheering for their robot as it charged the other one (the theme was "battlebots", where robots that tried to push each other off the table). The noise picked up after the first few elimination rounds, and the final match had everyone on their toes. The winning team started shouting and parading around with their juice box, while we sat back and laughed at their crazed response to winning something as simple as a box of juice.

We left the class with the feeling that the students were starting to take the class more seriously, while also enjoying their time a bit more. The key was to make them interact with each other more, and what could be better than a competition that requires fighting between the teams? Boys will be boys...

On Wednesday, we finally got the lego sets back from Accra Girls, so Lauri (who was the only teacher around) began building a robot to represent MIT. The other lego set was given to Accra Academy, which now had three teams representing (one team had one person). Students were improving on their previous battlebot design, and the results at the end of the class were clearly better than the robots they had accomplished in the past. Unfortunately, almost half the teams ran out of batteries and Lauri had no money to buy more, so the competition was postponed to next week. Lauri's robot is yet to be tested, but looks mean enough to be taken seriously.

Next week, we expect that robot quality will improve while competitiveness remains high. We will have our final battlebot competition on Monday, after which we'll start another project. The theme is yet to be decided, but we're again planning an interactive contest (so at least two teams compete on the playing field at once). What's more, we'll go back to autonomous robots, because we feel the students are now ready to give that another try. In case it isn't clear, the battlebots used touch sensor controls that were extended far from the robot so that a user could control the robot like a small toy with a game pad. This removed the necessity to consider simple AI/algorithms, because robots were controlled in real-time. Now that the students have had more practice with structure building and lego programming, we think they're just about ready to take the next step to autonomy.

7 Visiting High schools

As you already know, we successfully had a applying to MIT session for Presec High School Due to a busy schedule of extra-curricular events at Achimota School, we will not be able to hold an information session at Achimota. I am contacting three other schools, Accra Academy, Accra Girls Secondary School and St. Mary's Secondary School. Pipeline!

8 Publicity (a lil' mo' pigeon by Ato)

Eyo, we are gonna be treading on air on air on Radio Universe, Legon's radio station. The journalist is the host of Legon's computer link program (IT related stuff). The goal of the interview is to raise awareness

of MIT-AITI, its history and vision. We would also touch on African student initiatives as a whole, u know.

We hope to make noise and drum about MIT OCW through the interview as well. Open Course Ware is the next big thing, u know. Another radio interview is scheduled for sometime in August. Sunny FM, the radio station could not fix a July time for us due to a busy schedule. We still haven't been able to secure a newspaper article yet. The problem with this is the inability to find a journalist who would write an article about AITI. It's all in the pipeline, u know.

9 Yahoo Groups

We collected the email addresses of most or all of the students in order to create a Yahoo Groups for AITI Ghana 2004. We created the Yahoo group under Ghana 2004, and sent out invitations to about 50 students. We will gather the remaining emails this week and add those students to the Ghana 2004 Yahoo Group.

10 Ghana 2004 Exploring Ghana

This weekend we do not have anything in particular planned. We were invited by the professor to go into town and select some traditional Ghanaian garb, as a gift to us for our work at Legon. This was a fun experience. The G-unit girls went with a female friend of the professor to shop for clothing, while the G-Unit men went with the professor to buy Ghanaian clothes. After we went shopping for clothes, we did more shopping around town and at the Art Center. We were specifically looking for Ghanaian local hip-life music, which is actually quite hard to find. But rest-assured we found some! In addition to going shopping over the weekend, we managed to have some late night fun. Most of the G-Unit crew went out dancing on Thursday, Friday and Saturday night. We had a fantastic time at Celebration Night Club and at the Warehouse.

11 General Thoughts and Suggestions

It would have been beneficial to have a place where we post announcements everyday that the students would be responsible for looking at. We have been making some announcements verbally, some projected, and some on the whiteboard. We give announcements at different times of the day, and sometimes students are out for a moment, or absent, which makes it difficult to guarantee that all students here our announcements. If we could do it over, perhaps we would be consistent and always have an agenda projected on the board at a particular time, or all throughout the day.

12 Conclusions

We are working diligently to make sure that we are able to reach as many students as possible. Since the first exam, there has been a tremendous improvement in most of the students. They are working hard too, to understand the course material. We are starting to feel sad now that the summer is coming to a close. But we are having a great time, so it's all good! Thanks to AITI for their support and feedback.

Please be aware that the students paid about \$30.00 to be in the course. Professor Aryeetey explained to us that this nominal fee was to offset the cost of the university resources, such as priming, running the computer labs, and so forth.

Towards the middle of the summer we stopped having official group meetings everyday. Towards the end of the course, we re-adjusted our schedules so that we could start meeting everyday. This allowed us to

improve our communication and to be updated on all the activities that we are involved in. Advice we could give to future AITI teams: meeting everyday is pretty important, but can get tiring to do at night (we usually come home after 7pm, then start meeting after 8 or 9, and stay up until after midnight). We realized that having lunch together daily would be very helpful. We could not do this due to financial circumstances of some of the team members, and other team members getting sick from eating at the local chop bar or canteen. A lunch meeting is nice because it is in the middle of the day, and it helps the team to think about what has happened during the first half of the day and address any issues that may have risen.

A couple of USB cards is very helpful. We were able to transfer information between our computers very easily that way. Walkie talkies might be recommended if you do not have phones. Our team is planning to use a different lab (5-10 min away) for the final week to maximize access to computers, and we plan to use the walkie talkies to make sure announcements are made to both classes, and so forth.