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Bruce Gerson: Hello. I'm Bruce Gerson and welcome to this special Carnegie Mellon University G-20 podcast, in which you'll hear about some of outstanding work done by students this summer in Africa. With us today are students Beatrice Dias, a Ph.D. student in Engineering and Public Policy; Anthony Velazquez, a senior in Computer Science; and TechBridgeWorld project manager, Sarah Belousov. All three of our guests were involved in a 10 week internship program aimed at introducing various technologies to improve the quality of life in Tanzania. Welcome to all of you.

Beatrice Dias: Thank you.

Sarah Belousov: Thank you.

Bruce Gerson: Beatrice, tell me about your experience in Tanzania, about some of the projects you worked on and the impact you see these projects having in the future.

Beatrice Dias: Okay. We had three projects we worked on in Tanzania. One was with a primary school called Mlimani. It's located by the University of Dar es Salaam. And that project entailed building some type of literacy game or tool via some technology to help students learn English or get better at English. Second project was also with another school in the Dar region and that was directed toward assisting visually impaired students to learn to write Braille. And that was a project that had been ongoing prior to the internship but we wanted to improve the technology or, and cater it to Tanzanian schools. And then the third project was a little different. It was directed to towards assisting social workers in the field in collecting data on orphans and vulnerable children in the area and often the vulnerable children, meaning children who have, whose parents have died due to the AIDS epidemic in Africa in general and Tanzania. So, those are the three projects and our experience-- well, first of all when you move to another country, everything's different, you have to get used to. So, the learning curve is pretty steep. The first week we were all a little lost, getting used to the different pace was a big, big deal there. We're used to certain luxuries here or everything's facilitated here by technology. So in the U.S., the Internet's really fast, you know. We have access to the Internet pretty easily. There, it was a lot harder. So the students, our team took a little while to get used to that. And then the pace of things is very different in Tanzania.

Things are a little slower to get started and if you want to schedule a meeting, it takes a little longer to do that. And, you know, I was working with different people's schedules and time commitments and restraints and learning how to speak their language, not necessarily the Swahili that's spoken there but in lingo that people can understand what you're saying. So that took a while. I remember in my first couple of meetings, I spoke too fast, they said. I think in the U.S. we get used to speaking really fast and so people had a hard time understanding me. So you had to slow down your pace and make sure they actually understood what you were saying. So people have a tendency to just nod all the time and say yes to everything, so that took a little getting used to. And understanding physical cues from people, so looking them straight in the eye and actually seeing if they're comprehending what you're saying. So I often repeated everything twice. And then a lot of times I used somebody to translate into Swahili, so we understood that they actually were knowledgeable what I said and answering me truthfully to, you know, based on what I was asking. So there was, those were kind of the hiccups we had to face. And then, once a project started off, we started with interviews, interviews with the teachers at the different schools and interviews with some of the people involved in social work in Tanzania. Because our model is you go in, you talk to the community, you understand what the needs are, figure out how maybe technology can assist them in addressing some of these needs. So we went in and that was also a struggle, because explaining to them that we're not going to give them a computer to fix their problems was a, another obstacle or hurdle, basically. Because people's idea of technology, when you go in there, you say you're a technology expert, they expect you to give you, they you to give them a computer and it'll fix all their problems. But where they don't understand is, well, you get a computer. What are you going to do with it? You're not going to get Internet automatically. So stuff like that needed to, we needed to kind of explain our role, our model for doing work there and how it'll be-- kind of convince them that it will be more beneficial to them in the end if we do it this way, actually have a conversation and include them in the process. And I think they appreciated that towards the middle of it when they actually understood what was going on. So the beginning was basically getting everybody to sit down with us and have interviews. And the interviews were really good for us because we got to understand not only the technology aspects but just in general what type of infrastructure we were working in the different schools and with the social worker project, what type of infrastructure is in the country, to make these projects successful. So we started interviews, we assessed some needs and then we summarized our findings. And we had brainstorm sessions with the tech-visual team here as well as our iSTEP team members who are here in Pittsburgh and Doha. And then we discussed some options for technology solutions. Going in we had some idea of what the technology would be, but we had to make some adjustments, figure out what would actually work on the ground. And then after that, we developed the technology for our three projects. So that took, you know, two to three weeks to develop everything. And then go back to the community, do some demos, show the community-- well, this is what we came up with. What do you think? And again we faced the issue of they think

it's great but, you know, getting any criticism from them was a bit difficult, but they were very excited about having something new of something technology-wise because a lot of them don't have exposure to such things. So I think the general reception of the work was very positive and then we worked with them to try and understand what type of improvements we would need to make and what we need to do to set it up as a long-term project or deploy the actual technology. So that's kind of how we left things because by the time we did the demos and got some initial feedback about them, it was time to leave. That kind of gives you a sense of how long things took. The interview process took about the first three to four weeks, actually. And then, after that we took some development time and then going back to the communities, doing some demos, getting feedback and then, yeah, we had some discussions and tried to make sure that the partnerships that we created or developed on the ground would sustain themselves once we left. So keeping in touch with the communities via our primary partner, the University Computing Centre in Dar es Salaam, that was important. So we managed to introduce each party to the UCC, the University Computing Centre, so they would have somewhere to contact in case they wanted to ask more about the projects. And then we would also have somebody who would communicate with them on our behalf. So that's how we left things. Nothing is deployed yet, but they definitely have the technology there. Those are two projects, the one with the Braille Tutor at the visually impaired school, that, we left them with the Tutor, they are, the teachers are going to work on the Tutor and get comfortable with it because it took them a while to understand how to set it up, so we taught them. We had a little training session so that they could set it up, hook it up to the computer, start it up from the basics and then use it as a teaching aid in the classroom. So they're going to practice with it, same in the Mlimani Primary School where we had the literacy project. The teachers are going to work with the project and work, try and practice putting content into the-- we created a game for them where it was based in football or soccer, and so they're going to practice putting in questions into that game and, you know, they have it on their cell phones. It's a cell phone based game. So they're going to try and practice that. And then with the social work project, there were a few more obstacles because we're dealing with government organizations too. But currently the status of that project is, we're waiting on somebody in the government to actually take ownership of the project and so that we could work with them to actually deploy or do a pilot study in a small region in Tanzania. But yeah, I can keep going. I don't know if I should stop.

Bruce Gerson: That's great.

Beatrice Dias: Okay.

Bruce Gerson: Anthony, you participated remotely from Pittsburgh. Can you describe your role in the projects?

Anthony Velazquez: Well, nominally my position was as a tech floater and so each of these projects had an individual person who was in charge of all aspects of that project, sort of the manager for the project. So they got down and they worked with the people on the ground and discussed what they need most and then they also came back and decided this is what we needed to be doing for development. And so my role was sort of, I served as someone they could give tasks to work on for each of the projects. So like with the Braille Tutor, I ended up writing a lot of code for the project and I developed a new mode for the Braille Tutor that allowed students to sort of make music by keying into the Braille cells. And so like the Braille Tutor has a set of 32 cells which, with the six dots signifying a Braille cell and so students could key into those cells and it would play music back to the students to sort of get them familiar with the technology. With the social worker's project, I served as-- I wrote a lot of code for the back end of the data base where the social workers would send in information and reports and the data, so I wrote software that could record the reports coming in and sort them into a data base that could be exported later. And then with the literacy tools project, with, especially when you're writing games for literacy tools you want them to be very visually appealing, so I did a lot of graphics work for that sort of project. And so, nominally as a tech floater, my role was to serve as sort of someone who could just take tasks and work on them. But also given that I was in Pittsburgh, I also had a more subtle role where I was very much an anchor for the rest of the team because, as Beatrice was saying, they didn't know their day-to-day conditions and very much things like Internet access were something they took for granted here and weren't so available elsewhere. And so when the people on the ground had issues that they needed me to, that they needed Internet access for, I could do them easily. So like, when we had to change on the ground based on what we found out and we needed research similar projects or see what else's worked, I spent a lot of the earlier weeks researching other projects that did similar tasks so we could sort of see where we could go, what other things have been tried and sort of be an additional resource for them. So given that they didn't have stable Internet access and I was able to, I was privileged to a lot of luxuries they didn't have on the ground, I was able to do a lot more research on what has and hasn't worked. And so when we were going through the development or before we got to the development phase, I was able to sort of weed out a lot of the ideas that weren't going to be plausible and maybe come up with a few more that would be more plausible. And so that sort of encompasses what my roles here were in Pittsburgh.

Bruce Gerson: Sarah, tell us about TechBridgeWorld and this new innovative internship program.

Sarah Belousov: Well, TechBridgeWorld is a broader research group here at Carnegie Mellon which is dedicated to exploring technology innovations and partnership with developing communities around the world. And this was started five years ago by a

faculty member in Robotics, whose name is Bernadine Dias, she actually completed her Ph.D. in the Robotics Institute and then stayed on as faculty and among her many research projects, she's very dedicated to the idea of computing technology for developing communities. So in the past five years, we've built a research group which offers courses to students, internship programs like the iSTEP program, Innovative Student Technology Experience, which Beatrice and Anthony were participants in this summer, and we also offer seminars throughout the year and participate in conferences and actually publish our research in this field in a variety of venues. We actually are seen as a leader in the field of information and computing technology for development and we just hosted the 2009 ICTD Conference at Carnegie Mellon University in Qatar this past April. We're very fortunate to have both Bill Gates and Carlos Braga as our speakers for that event and it was seen as a success by many people around the world who attended. One of the things that I wanted to mention about this particular program is that iSTEP was just launched this summer with Tanzania as our first location and we wanted to design something as a very unique student experience that would focus on bringing together a multi-disciplinary team of students who would be globally distributed in their work and would be conducting research projects in collaboration with developing community partners on the ground. And through this program we've seen that technology, as we've seen in many of our other projects, technology really can have a positive impact in communities. And as Beatrice said, it takes a lot of work for these things to happen. That's why it's important for them to spend something like ten weeks on the ground in Tanzania to really work closely with partners, to go through those challenges together with the partners and then to develop technology solutions that really meet the needs of those partners. And we hope to continue these partnerships in the long term that were begun this summer in Tanzania. So two primary aspects of our work are to create partnerships with developing communities, to explore the positive impact that technology can make in developing parts of the world and also to create these unique student experiences which really can have a life-changing impact on our students. And if they do have a moment, maybe they could talk about the positive impact on each of them because that was something that we've seen in a lot of their writing about the programs. If you'd like to learn more about TechBridgeWorld, feel free to visit our web site, www.techbridgeworld.org. You're welcome to contact us with any interest and questions. And that's all.

Bruce Gerson: Beatrice and Anthony, I'm sure the work you did this summer will greatly benefit the people in Tanzania, but I'd like you to speak on a personal level and from a student perspective and tell us how this experience has affected you. Beatrice?

Beatrice Dias: Well, it's impacted my life pretty significantly. I grew up in Sri Lanka, which is also a developing country or a developing community or country, and the problems in these communities are vast. I mean, you can't even begin to address them with a ten week program, but there were certain moments in Tanzania where you feel

overwhelmed, so, particularly when you're listening to the needs that they're talking about. So in one school, for example, there was no electricity. The classrooms were in disarray in sense, there were holes in the ground you could trip over. The black board was gashed in the middle. The conditions are really bad in some of these schools and still the students are excited about learning and teachers are, they're not necessarily negative, you know, they deal with, use what they have, they're very resourceful. So it's encouraging. It's also overwhelming. But then when you present them with this technology that's new and you spend time with them, developing something with them in partnership with them, they see something that they helped create. It's a really indescribable moment where they excited about the project and the technology itself, but they're also excited about being involved as co-owners of the work. And that's a big difference in the work we do with tech-visual, I think, rather than going in and donating a computer, it's very different. It's a very different feeling where you have buy-in and ownership with the partners on the ground.

Bruce Gerson: Anthony?

Anthony Velazquez: At Carnegie Mellon I do a lot of work in diversity in computer science and so, there's been this model computer science is very stereotypical and so, in, I do a lot of work in trying to break out of that model and give different views and so when people think computer science, they're very much think the cubicle model of, that's what you're doing to end up doing and so, I work to sort of break that model. And so through my experience at TechBridgeWorld in sort of developing, through TechBridgeWorld I've been sort of developing technology that helps people and makes a difference and sort of outside of what you may think developing software and writing Microsoft Word or any of that. So to have this experience and be able to talk to other students about this experience and sort of what you can really do with computer science is very positive for me. And to show the computer science students that were on the ground and show them pictures with them, pictures of them with lions and pictures of them with students and sort of interacting with people, it gives them a very different image what computer science is and what computer science can do, which can really help the computer science community as it is, which seems to be declining in the recent years.

Bruce Gerson: Beatrice, Anthony and Sarah, thank you for your time and for the important work you're doing with TechBridgeWorld. This has been a Carnegie Mellon University G-20 podcast. Learn more from our faculty experts at CMU.edu/G20. Thank you for listening.

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