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Short Report

Café Sci East Africa: talking with young people about science and technology

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Betty Kituyi Mukhalu is co-ordinator of Café Sci East Africa. Her passion for science is reflected in the success of Café Sci in Ugandan schools and in other informal science programs she co-ordinates, for example FundiBots – a programme that uses robotics to introduce young people to science, technology and engineering. She has organised several local and international science conferences. She is a member of the Ugandan National Biotechnology Essay Evaluation Committee.

Ann Grand is a Visiting Fellow at The Open University, where she previously had been a member of the RCUK-funded Catalyst for public engagement with research. She is also a part-time Research Fellow in the Science Communication Unit at the University of the West of England, Bristol, specifically focussing on embedding public engagement within research projects. Ann has been a prominent member of the Café Scientifique movement since she started the Bristol Science Café in 2003. Since 2010, she has been voluntary webmistress for the network, advising new café organisers around the world and hosting and maintaining the website.

When Café Sci started in Ugandan schools in 2009, it was rare for scientists to visit schools to talk about their research. Former students might speak at career days and the National Council for Science and Technology set up occasional school visits by scientists but the visits seldom focussed on the students' interests in science and technology.

As discussed in Ann's earlier article[1], the aim of Café Sci is to support informal, but respectful and rational, conversation between scientists and young people. With the support of the UK's Wellcome Trust, the British Council and the Ugandan Ministry of Education and Sports, the Café Sci project began in Ugandan secondary schools, primarily in the area around Kampala and Mbale, in 2009. By the time the project finished in 2012, Café Sci had established itself in 35 schools as an effective route for scientists to meet young people to discuss issues in science and technology that came from the *students'* interests. We ran about 400 cafés, as well as three conferences where students were able to share their experiences.

I (Betty Kituyi) came to Café Sci from a background in science teacher training. My role as Project Co-ordinator was to go into schools, sit with students and learn what issues in science and technology the students wanted to discuss. Working with teachers and student co-ordinators in schools, I then identified scientists from academia, research centres or medical facilities who were willing to go into schools and lead science cafés. Right from the start, we hoped that the lessons learned from the Ugandan project would be shared across the continent.

Sabrina Kitaka is a popular speaker on free will and adolescent health.

In science cafés, scientists hold lively conversations with students on aspects of science beyond the science curriculum that the teenagers want to explore. Topics have included *Space*, *Robots*, *Global Warming*, *Mobile Phones*, *Social Media* and the *Science of Love,* among many others. In one school, a scientist might use classical physics to unravel ghost stories; in another, students can ask a space scientist 'are we alone?', 'is there another planet that can support life?', 'will the sun's energy ever end?' Or an international team of astronomers might share their research experience and demonstrate how to use their telescope. In cafés, we witness doubts disappearing from students' faces as hope, and 'seeing is real believing', happen. Science cafés are nothing like normal science lessons, nor are they lectures. They take place after school or at lunchtime, not on the school timetable. Cafés are conversations between the scientists and the students, with questions and thoughts and comments tossed from one to the other. Engaging with students like this helps them learn how to ask questions; a vital skill for science students. In a country where much emphasis is put on covering examinable content and academic scores, and little on cultivating students' enthusiasm, Café Sci offers a new method for inspiring, tapping talent and nurturing students' passions for science. Cafés have proved to be a strong component of the informal science curriculum and are helping to enhance students' attitudes to science.

By paying attention to students' curiosity and interest, scientists in the Café Sci programme are, perhaps without realising it, influencing students' attitudes to science. Café Sci cannot directly help students improve their grades in the national exams but it can help develop their broader understanding of science in the modern world, by giving them opportunity to engage with real scientists who actually do science. When a teacher phoned to say a Café Sci student co-ordinator had topped all other students, with the best aggregates in the O- or A-level exams, one impact is immediately apparent. Other impacts of the Café Sci programme have been noted: eminent Ugandan and international scientists are visiting schools, and Café Sci students are winning internships in national science competitions, getting jobs in science projects, going on science field trips, attending conferences and more.

Compelling success stories such as these led to the development of a new project: *Café Sci East Africa*, which is reaching out to schools in northern Uganda, Rwanda and Burundi. The three-year project (2014–2017), again sponsored by the Wellcome Trust, through an International Engagement Grant, has learned lessons from the first project. One vital element will be to enable school cafés to become self-sustaining, so we are taking a slightly different route for organising and supporting cafés. Once again, I am acting as project co-ordinator, but Ann and I are working closely together on key technical and development issues; Ann drawing on her experience as volunteer mentor for the international café scientifique network and me on my previous experience as Café Sci co-ordinator.

Solomon Benge leads cafés on robotics.

The success of Café Sci continues to depend on the teachers' enthusiasm and the quality of the interactions between speakers and students. But with a greater geographical spread, across three countries, our focus is on developing online and offline resources to support teachers and students to organise their own cafés and scientists to become effective café speakers, so that cafés become sustainable in the long term. We are currently developing a website that will host the resources and be a forum for interaction for teachers, students, speakers and co-ordinators across the East African region and perhaps beyond.

Patricia Spinelli (GalileoMobile) shows a student how to use the telescope.

So far, six schools in Gulu, in northern Uganda, have been introduced to Café Sci. In three schools, students have chosen their topics and are looking forward to their first café. The major challenge is that this is a new idea in every school we go into; some teachers are uncertain whether it will succeed. Café Sci must also compete with the many other school activities that students enjoy. But if the teacher is strong, believes in the principles of Café Sci and can lobby for time, cafés can succeed. Another challenge is the issue of speakers' transport. Some scientists are willing to personally meet the costs of travelling to a school, because it is an opportunity to give back to the community and nurture the next generation of scientists. But in an economy where scientists are paid very little, it is rare for a scientist to be able to afford such visits. To get things started, we have earmarked a modest amount of money for speakers' expenses; eventually, schools must find ways to meet this cost themselves. Keeping track of local impacts of Café Sci will be vital evidence for enthusiastic teachers to convince school managements to support the Café Sci programme.

As we move into two new countries, we will have to understand how their different political systems influence how non-government organisations can offer informal programmes. We have come to appreciate that finding key people, who are passionate about the concept and can navigate the local scene, is vital in ensuring that Café Sci takes root. We have also learned the importance of getting the relevant Ministry of Education on our side, as that makes teachers feel more confident about hosting cafés. We are taking these lessons into northern Uganda, Rwanda and Burundi and are establishing links with influential people in government and policy. The simple, robust and low-cost Café Sci model offers a space for students, teachers and scientists to develop the skills to discuss important issues with confidence, bringing their personal experiences and expertise to a forum in which they can engage together in sensible and good-natured discussion about the issues in science and technology that affect their daily lives. Such conversations, promoted in an informal and friendly atmosphere, help create a solid base for future citizenship. Through discussion, students learn as much about each other, and the importance of learning to live in a world of different and sometimes contradictory views, as they learn about science.

Reference

1. Grand, A. (2014) *Sci. Prog.*, **97**, 275–278.