We have recently initiated the introduction of the Hands-On Universe curriculum into secondary schools in Nairobi, Kenya. Our primary goal for the last year has been the establishment of a pilot school in Nairobi. To achieve this end we have identified a school to which HOU software was distributed, held a web-conference for teacher training on the HOU software, and registered HOU as an official organization in Kenya.

1. Introduction

Our primary goals were to establish the Hands-On Universe (HOU) curriculum in Kenyan schools in the effort to confront the current deficit of research-based education in Africa, and to establish a support network for Kenyan teachers and students that addresses their unique concerns and connects them with the Global HOU effort.

Astronomy is a captivating science. By engaging Kenyan students in actual hands-on science research projects via the HOU curriculum, we aspire to motivate and prepare them to pursue science and technology higher education and careers. By founding our initiative at Kenya High, an all-girls school, we aim to motivate young women, in particular, to consider careers in science and technology. Our effort to make the global, web-accessible science education resources available to Kenya, and to connect Kenya to the online, international, science education community, will benefit the teachers as well as the students. By engaging young students in current science research, we prepare an informed generation of future educators.

2. Infrastructure Building

We launched the Hands-On Universe program in Kenya High. Kenya High is a public, national school situated in Kileleshwa in Nairobi province in Kenya. The student body consists of over 800 female students from all over the country. It is one of Kenya’s oldest schools and has maintained a track record of excellent performance in the national examinations over the course of its history. The science subjects taught at the school are biology, chemistry, physics, computer science and mathematics. The school has three computer labs and a local area network of 80 computers connected to two servers. They currently lack internet access though the process of infrastructure installation has recently begun. The HOU software has been installed on 32 computers in a Kenya High computer lab. This will facilitate a class of around 30 or more students. In September 2006 the teachers were introduced to HOU CDs and they embraced the idea. Our hope has been to establish and sustain HOU at Kenya High and later begin to encourage other schools to join the HOU network of students, teachers, astronomers, and other educators.

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3. Teacher Training

In order to perform teacher training via web video conferencing it was necessary to have a number of internet accessible computers for teachers to use during the training session. We decided to enlist the services of a commercial partner for this venture. A proposal was written that requested internet service, computers, and video conferencing software and submitted to UUNET, Inc. UUNET is Kenya’s largest and most reliable internet service provider. The proposal was enthusiastically accepted; internet service and a conference room were provided at the UUNET office in downtown Nairobi.

On May 10th and 11th, 2007 we held an Internet teleconference workshop for nearly a dozen teachers at UUNET. The workshop was video-conferenced from out of Berkeley Lab via SightSpeed, Inc., a highly praised free Internet video and voice communications services provider based in Berkeley. Running the conference from Berkeley was Rich Lohman, a veteran high school science teacher and HOU trainer, with assistance from Carl Pennypacker. Each day of the workshop featured a three-hour session that started at 4.00 PM. The dedication of the teachers to leave work and drive across town to attend the training session after a full day’s work was admirable to say the least. Nonetheless, spirits were high throughout the sessions and teachers typically stayed after the session to discuss what they had learned and continue to study the software.

4. Sustainability Model

To facilitate the sustenance of HOU Kenya, we propose the establishment of a website and a modest office infrastructure. It would be advisable to create a HOU Kenya website showing what the students and teachers are doing with HOU in Kenya High and other schools that will end up using HOU software. The website will be hosted locally as it will be easier to support it locally. The website will also facilitate the exchange of exciting activities and ideas of how to bring space science and astronomy between teachers around the GHOU network, access to new HOU software and upgrades, and continuous access to current up-to-date information on space science and education. This information will then be disseminated to schools in the Kenya HOU network. We anticipate that our central office will give presentations to teachers and students periodically to update them with what is taking place with schools in the rest of HOU network and to propagate access to the newest data and software.

5. Future Plans

We have begun preparation for an agreement with the British Council to give Kenyan teachers and their students, future access to images from the powerful 2-meter Faulkes Telescope on Haleakela, Hawaii. The Faulkes Telescope is the cornerstone of Las Cumbres Observatory Global Telescope Network, which operates research class robotic telescopes in Hawaii and Australia.

We have begun interacting with the astronomers and science educators from across Africa for introducing the HOU curriculum in their countries. Two of the authors (Murabana and Oluseyi) will attend the IHY-Africa meeting in November 2007, which will host 63 African science and educators from 19 countries [1]. They also will attend the MEARIM conference in Cairo, Egypt in April 2008, which will bring a planned ~ 300 scientists and educators from all over Africa and the world [2].

Finally, we are planning to develop a cd/dvd based data archive for HOU that would be appropriate for rural African schools where the internet is not accessible. Students would be able to perform virtual observations and carry out analyses.
6. Conclusion

We have successfully initiated the introduction of the Hands-On Universe curriculum into Africa. Through meetings such as the IHY-Africa meeting we have also increased the awareness of HOU on the African continent. We plan future teacher training sessions and look forward to students all across Africa planning telescopic observations, performing data reduction, and making scientific measurements from their data. With some luck, African students will be discovering new asteroids, new comets, and new supernovae in no time!

References