Astronomy Education in Developing Countries: the role of Developed Countries

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Abstract.

Here I present a personal view, focussing on the role of developed countries and the potential opportunities for enhancing astronomy education in developing countries. In particular, I emphasize the importance of using the web for astronomy and running an external visitor’s program.

1. Problems and Solutions

Astronomical research and education in developing countries faces a number of hurdles. There are always financial constraints and often other difficulties particular to individual countries. For example, political and economic upheaval, the role of women in society, fear of western ideas and ideals etc. can all hinder the progress of astronomy. The problems are complex and even if a simple solution were possible it would not work for all countries.

As well as problems, there are of course opportunities – it is the latter that I wish to focus on. Although they may lack financial and technical resources, developing countries often have a large supply of human resources (i.e. good people) and access to small telescopes. A lot of fundamental astronomy is, and can be, achieved with small telescopes. As the developed countries start to close their small telescopes to fund expansion to 8-10m class telescopes, this offers an increased role for developing countries.

2. Some Ideas

2.1. The Internet

I see the internet as a great resource for astronomy which will act to ‘level the playing field’ for astronomers in developing countries. A large number of ground-based and space-based databases are now online. A particularly useful database is the HEASARC service based at Goddard Space Flight Center allows users to query hundreds of different catalogs...
and services distributed all over the world, using a simple interface (see http://heasarc.gsfc.nasa.gov/astrobrowse/). From this and other databases, anyone can access HST archive images or CFHT spectra for example.

Through the Astrophysical Data Service (see http://adsabs.harvard.edu) astronomers can access up to date journals online. This could remove the need for expensive library subscriptions. The developed countries need to ensure that this access is enhanced and maintained. Preprints can also be effectively ‘distributed’ without the need for expensive postal mailings using services like the Los Alamos Preprint Server (see http://xxx.lanl.gov/).

It is still however desirable that papers are refereed and submitted to an international journal as is done now. Eventually wholly electronic journals, with very low fees, may be established.

A number of universities and lecturers are creating web–based learning courses. I encourage universities in developed countries to make these available world wide. Such distant–learning will no doubt be more common in the future, and should help to raise the standards of education in developing countries. A current list of educational resources in astronomy can be found at http://webhead.com/WWWVL/Astronomy/astroweb/yp_education.html.

2.2. Visitor Program

Another fruitful area I see for developing countries is to attract overseas astronomers to give seminars/lecture courses. The way to do this is via a visitor’s program. Astronomers can often make stopovers from conferences and observing trips without much additional expense. Many would be willing to stay a while if local expenses were covered. Local expenses are usually cheap in developing countries and within the budget of the local institute. I know of 2 institutes (UCA in India and INAOE in Mexico) that currently run successful visitor programs. Once a program has been setup, it should be advertised e.g. at conferences, on a local web page etc.

2.3. PhDs at the University of Birmingham

Another avenue where developed countries can help is to offer PhD positions to students from developing countries. The Astrophysics and Space Research group at my University takes on several PhD students each year. Subject areas include astronomical research, solar physics and space instrumentation. As well as a special studentship scheme for Chile, Brazil, Argentina under the Gemini telescope program, the University also offers an open international studentship.