Comments on the 1994 Young Scholars Program

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The NPAC Network Multimedia Class

The Northeast Parallel Architectures Center (NPAC) was asked to provide a course on computer technology for a group of 7-8th grade students as part of the Syracuse University Young Scholars Program during the summer of 1994.

In designing a class on computer technology, we felt that the two most important educational principles were for the students to learn by doing, i.e. hands-on experience, and that every student should be able to successfully complete a computer project.

The project we decided upon was to teach the students how to use Mosaic, a revolutionary new tool for exploring hypertext multimedia information in the Internet, and to have the students create their own multimedia documents that could be viewed by everyone on the Internet using Mosaic. In the process, they would learn computing and communication skills, including the preparation of documents and linking together text and image information.

If you have access to the Internet and Mosaic, you can see the results by entering the URL `http://www.npac.syr.edu/EDUCATION/PUB/YSP/YSP.html`

Computer Facilities

Organizing the computers and equipment for quite large classes of 20 students was quite difficult. Ideally, we would have liked to use Macintosh computers that the students would probably find more easy to use, and which would be what they would use in their schools or at home. However the only Mac clusters available at Syracuse University could not access the Internet, although these clusters are supposed to be networked and have Mosaic installed this fall. Also, Mosaic for the Mac is currently still in the developmental stage, however it should be usable by next summer.

We therefore decided to use Unix workstations. This allowed us to use a more robust version of Mosaic, and to have access to a networked cluster of 20 IBM machines, in the MAD Lab in the basement of Link Hall. Unfortunately these machines require much more systems support, and this was decidedly lacking at the beginning of the program. It was only the result of a high-level plea for help after the program had already started and we were running into terrible problems that we got the required level of support from Academic Computing Services to get Mosaic running properly on these machines. In the future, we would need to ensure that we have the ability to gain adequate support from ACS to prepare the systems environment for these classes.

The other problems we faced were that the machines in the cluster often broke down and were not fixed, so that for most of the program we had less than 20 usable machines, and students had to share computers. Another problem was the lack of a teaching station that could project the teacher's computer screen so that it could be seen by the whole class. Hopefully we can find a lab with this facility next summer.

The Classes

The structure of the classes was that two groups of 20 students each would come for a two hour class on alternating days. Two hours was probably too long for each class, and interest tended to wane after the first hour. An hour a day each day, rather than two hours on alternate days, would probably have worked better.

The class size of 20 students was about the maximum we could effectively handle.

The Teaching Assistants

The students needed a lot of individual help in using the computers, fixing problems, and doing the work on developing their documents. It is absolutely crucial to have enough knowledgeable people in the lab to help answer students' questions and deal with their problems. We found that we needed 3 or 4 technically knowledgeable people to do this, i.e. about 1 teacher or TA for every 5 students. There was also a lot of work that needed to be done outside class, such as downloading and editing the photographs we took of the kids with our digital camera (which was a big hit with the kids), scanning and editing other images, etc.

We initially requested funding for some TAs to help prepare and run the classes, but we were told that the program did not have enough funds to provide extra people, and that TAs were being hired for the program and they could be used for this purpose. As it turned out, they could not – they knew as much about computers as the kids did (i.e. almost nothing), and basically their only function was to help with "crowd control".

The TAs for this program should be minority college or grad students who are majoring in math, science or engineering, knowledgeable in these areas, who get involved in the classes and are enthusiastic about helping teach the kids. This did not seem to be the case for the TAs this summer.

The Students

The idea of the program is to try to keep students interested in science and technology. However, it was clear that many (most?) of the students in the program had little or no interest in these subjects. Some of the students who *were* interested in learning complained that they didn't like the program because of the disruptive effects of those students who were not interested in anything but socializing and fooling around. A more careful screening of the students involved in the program is clearly required.

In some of the articles they wrote for the class, students said things like "I came to the young scholars program because I would have nothing else to do this summer", which does not exactly suggest a burning interest in the program or in science. Others listed non-science topics as their favorite subjects at school, or as their career goal (2 people said they wanted to be lawyers: one because "lawyers make a whole bunch of money"; the other because "I am very good at having my own way"). This also suggests a lack of interest in science. Intensive programs like this are probably only going to help people who are already interested in learning about science – they are unlikely be helpful in sparking an interest in science that does not already exist.

Teacher Involvement

Ideally we would like to have involve a middle school teacher in the preparation and running of the classes, since teaching 8th graders is not something that NPAC staff are trained or experienced in doing. It should be possible to identify local teachers who would be interested in working on new computer technology and using the Internet, and would be willing to help work on such a program over the summer. It would perhaps be best if any teacher contact was officially coordinated through the program, although NPAC would be willing to help in finding interested teachers.

General Comments

Many of the students appeared to learn quite a lot from this course, and could use the computers quite well towards the end. Most completed the requested work to develop their own multimedia "home page" describing themselves and their interests. The students' reactions to the course (and to the program in general) were mixed. Most students enjoyed exploring the Internet using Mosaic, and many were interested in using multimedia technology and enjoyed creating their home pages, while others became disinterested and bored.

The program was probably too long, especially since the kids lived away from home. Most complained that they did not like living away from home for such a long time. Also, the program may be a little too intense for kids used to a much more leisurely pace and shorter hours in school. This may not be such an issue if the program was a little shorter (maybe 2-3 weeks instead of 4).

The biggest change that we would like to see in this program is to work harder at nurturing an atmosphere in which the kids feel it is OK to be smart and like science. Choosing good TAs would be a big help in this goal.

Since this was a new course, there were a few glitches, especially early on, however we have learned a great deal from our experiences in this first year, which will allow us to make improvements in this course for any future programs. NPAC is very interested in the area of using computer technology for K-12 education, and we would therefore be happy to assist in any future programs of this kind.