Teachers Can be Scientists Too!

Project Findings

Our proposal was to introduce middle school teachers to a variety of the hands-on science activities that have been developed for the “Kids Are Scientists Too!” (KAST) program over the past nine years. This is a summer “science camp” type program in which students in grades 4-9 can spend a week (9:00 a.m. to noon each day) doing science experiments in one of a variety of scientific disciplines. We matched up middle school teachers with particular modules in which they expressed an interest. While we had planned on the participation of ten middle school teachers, with a shortened recruitment period we were only able to match up seven participants with their areas of interest. These “TNE teachers” were assigned to the following modules: Chemistry (two teachers), Physics (one), Science Camera’s Action (one), Marine Science (one), Forensic Science (two).

In interviews with the participants, we learned something about their attitudes toward science, the teaching of science at the middle and upper elementary school level, and areas in which they felt that they could use some help. We then gave each of them some training in the particular modules to which they were assigned, working with the graduate students assigned to the same modules, so that everyone would have an understanding of the experiments that the middle school students would be carrying out.

The different modules utilized their TNE teachers in slightly different ways, so I will describe how the Chemistry module (with which I am most familiar) operated. Each teacher was paired with a graduate student, and the two of them were assigned a group of 7-10 middle school students. Together they would guide the students through a series of eight to ten hands-on activities each day, usually grouped around a particular theme (colors, crystals, etc.).

What we found was that the teachers learned a great deal about the chemistry underlying the experiments from the graduate students with whom they were paired. The graduate students learned a great deal about how to handle students of the middle school age level from the TNE teachers. As an administrator of the program, I was very impressed with how much more smoothly the module ran when we had both a TNE teacher and a graduate student working with the group of middle school students.

The final measure of the success of the program will be how much of the KAST activities can be used in the middle school classrooms of the TNE teachers. We met as a group over dinner on April 25, 2006 to discuss how much of an impact the KAST experience had on their classroom activities. What we found was that all of the participating teachers had been able to incorporate new science activities into their classrooms, and that their attitudes about how to present science to their students had changed. They could better understand, appreciate and apply the inquiry approach to science.
**Contribution to TNE goals**

Teachers of middle school science often find it difficult to engage students with the teaching of science. We feel that this can most effectively be accomplished through an inquiry approach and hands-on science experiments. By exposing some of these teachers to a variety of science experiments, actually carried out by students of the appropriate grade level, we hope that the TNE teachers will see the value of including inquiry type experiments in their classrooms. These teachers should also see the UConn faculty and staff as a resource for both information and supplies in developing better classroom activities. By selecting teachers from a number of different area schools, we were also hoping to see the multiplier effect, where one teacher will share ideas about this type of experiment with other members of their grade level team. This should lead to some systemic changes as to how science is introduced and taught.

**Recommendations and Conclusions**

Our initial observations are that the TNE teachers are including more effective science teaching in their classrooms. We have been gratified to find teachers coming back to us during the school year looking for advice and supplies for classroom activities. While we have made no attempt to provide a comprehensive curriculum or even a set of lesson plans on a particular topic, we do believe that the participating teachers are using both specific ideas and more general inquiry-based teaching in their classrooms.

We were not able to recruit the teachers for this project that we had described in the proposal. Because the notice of the grant award came late, we simply did not have the time to effectively recruit as we had planned. We were only able to fill 70% of our intended slots and, in addition, we were not able to identify the more science-phobic teachers who probably would have more greatly benefited from the experience. The teachers who did work with us were very enthusiastic about the program.

With new emphasis on the teaching of science at the elementary and middle school levels, we believe that giving teachers at those levels more confidence in their science skills will make a big difference in how science is introduced. Summer programs where teachers can see first hand the value of inquiry based experiments, especially when the teachers can discuss the underlying scientific concepts with practicing scientists, appear to be a valuable and cost-effective approach.

Dr. Arthur Dimock  
Chemistry Department  
U-3060  
486-3216  
fax 486-2981  
arthurdimock@uconn.edu

Ms. Joy Erickson  
Chemistry Department  
U-3060  
486-9219  
fax 486-2981  
joy.erickson@uconn.edu