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Making the Most of Peer Tutors in the Science Classroom

by

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The Willetton Senior High School Story

I currently have three peer tutors that come to school for at least one hour a week each to work with my science students. Two of those tutors Yolanda and Siti have been with me for the past three years.

My personal philosophy of science teaching is that I teach students to be scientists rather than just teach them science. I am the Academic Talent Coordinator for our district and I have found this approach to be incredibly successful, especially with the gifted students.

At the beginning of each year all of my students select an area of interest that they would like to research. They spend about half of their class time for six months of the year on their own research -- like a mini honours project. The project must be based on experimental work of some description, not just library research.

All students enter their projects into the WA Science Talent Search and the BHP Science awards. Last year in the Science Talent Search they won 1st and 2nd in Physics, 1st and 2nd in Biology, 1st and 3rd in Environmental science, 1st in Human biology and 1st in Scientific photography. In the BHP awards they won 10 of the 116 prizes offered.

This year in the Science Talent Search they won 1st and 3rd in Physics, 1st and 2nd in Biology, 1st and 2nd in Agricultural Science, 2nd and 3rd in Chemistry second in Human biology and 1st, 2nd and 3rd overall in the competition of 1000 students. In the BHP awards they won 11 of the 116 prizes offered, and one of those 11 students is in the top four in the country. Total prize pool for the past year is over $12 000.

This type of work is very well suited to the use of peer tutors in the class; in fact, it would almost be impossible to do this work well without peer tutors.

My students require help from peer tutors with

- Experimental design. Working out how to conduct a fair test; the use of controls. The use of adequate sample sizes, especially for biological topics.
- Experimental technique. How to go about the day-to-day running of their project.
- Statistics. This is one area that sets us apart from other schools. Statistics are rarely performed in high school research projects, other than the calculation of an average. This is a perfect area for peer tutors. Most teachers have not studied statistics since the first year of their degree, if at all. Peer tutors hopefully have a more recent understanding and so are better equipped to help our students.
- Literature searches.
- Writing their report.
- Subject selection. This is one of the most important areas of student research. A poor topic has to be exceptionally well done in order to be successful.

Teacher responsibility

1. Make the lessons peer tutor-friendly.

A peer tutor is of no use to the class if they are just watching the teacher talk through the lesson. There are many occasions when the most suitable method of teaching is to 'chalk and talk', so teachers needs to schedule their lessons to suit the times when the peer tutor is present. Ideally, the lesson should be student-centered, so that the tutor can wander and help those most in need.

Tutors can best interact in

- Laboratory work
- Group work

- Project work

2. As teachers, we need to remember that peer tutors, no matter how competent, are not trained teachers. They should never be left in the class alone.

A peer tutor may make a small fundamental teaching error, like spending all of their time with one or two students. In this situation it is the responsibility of the teacher to suggest a change. It could be suggested to spend a maximum of five minutes with each student.
A peer tutor is not expected to speak to the whole class, that is the teacher's job. A better situation for a peer tutor is instructing small groups. For example, I recently had a class of lower ability students and I needed to show them how to use a pipette and pipette filler. It was a perfect situation for my peer tutor to demonstrate.

3. Discover the educational background and skills of the peer tutor.

To gain the most benefit from the peer tutor the classroom teacher should utilize the skills of the tutor, especially in areas where the class teacher is weak. For example, one of my peer tutors is a botanist and has a strong background in research, having just finished an honours degree. I make the most of her knowledge by steering her towards students with particular needs in those areas.

4. Make use of the peer tutor's university contacts.

I don't know about other universities, but Murdoch University is very keen to form a relationship with schools. Peer tutors may be able to organise excursions or use of laboratory equipment. In the past twelve months my students have:

- As a whole class, visited a biotechnology lab to extract DNA, run gel electrophoresis and perform DNA finger printing. All for the unit on genetics they were studying.
- A small group of students has visited a chemistry lab to extract oil from eucalyptus leaves.
- Peer tutors have taken samples of the leaves of Venus fly traps to the University for chlorophyl analysis
- We have borrowed a spectroscope from the University.
- A professor from Murdoch's chemistry department has given me ideas for future student research.
- A staff member from Murdoch has been used to assess a piece of work for the CSIRO Gold CREST programme
- Peer tutors have accessed information from the Murdoch University library.
- Murdoch has donated plants to the school that were no longer required at the University.

Peer tutors are a great asset to the science classroom, helping to create a caring, positive learning environment.

Darren Hamley has been teaching science throughout Western Australia for 16 years. His main emphasis has been on teaching students to be scientists rather than just teaching science. Darren has used peer tutors in his classroom for the past three years and currently has three Murdoch University students. In 1998 Darren was recipient of the inaugural Florey Science Teacher Award for his work on student-centred research. He was Science Teacher of the Year in 1997.
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