REPORT: TEACHER IN RESIDENCE PLACEMENT

During Term 2, 2015 I was fortunate to take part in a “Teacher in Residence” program with the University of South Australia, Mawson Lakes Campus. It began with an initial discussion on the areas of interest that I had with the view to possibly embedding it in the teaching of our students at Pedare Christian College or within the ONE+ campus. The topics which were discussed included Energy Efficient Housing Design, Sustainability, Water Processing, Engineers With-out Borders and Passive Solar Design.

The UNI SA have a Connect program with high-schools offering a variety of workshops to students in both middle and senior years. I was interested in observing the 2 hour workshop “Engineers without Borders” aimed at students from year 8 to year 11. When I attended it was a class of year 8 students. They were placed into groups and the challenge was to build a water filtering system from everyday materials and then use a solar powered pump to pump water from one place to another. The most interesting aspect was that each group were allocated a country and they were given a budget allocation reflecting their country’s economy. When it came to purchasing materials they had to barter and rely on the goodwill of the more affluent countries. This was of most interest to observe as they had to design their filter using only the materials they could afford and much was learnt about the economies of their country.

The second part of the workshop was to find the most effective arrangement for a solar powered water pump to pump water. Questions that were investigated included:

- Does the wavelength of light affect the electrical voltage generated by a solar panel?
- Does shade affect the electrical voltage generated by a solar panel?
- And does the angle of the solar panel affect the electrical voltage it can generate?

The students found this a challenging exercise and it provided excellent opportunities to test and measure the effect of a number of variables.

Several weeks later I returned to have a discussion with Professor James Ward and two of his PHD students, Premila and Eugene. We discussed their projects which included sustainable irrigation and recycling waste water from a fish farm to irrigate food crops. The discussion was with the view I would come back and view their project but due to time constraints that did not eventuate. I still found it very interesting listening to their challenges in constructing their projects as well as their continual monitoring. Unfortunately, I learnt in discussion, Eugene’s fish farm had been vandalised the previous week-end where he lost many of his fish.

I was still very interested in “Engineers without Borders” so I decided to return and listen to students reporting on their EWB project which is part of the first year course, Sustainable Engineering Practice. Each group of 5 or 6 students had to prepare a report and present it to the rest of the class within a time period of 15 minutes.

This year the focus culture was within the Bambui Community in Cameroon, Africa. Each group had to develop an appropriate design solution, for a specific area of concern. These included water supply, sanitation and hygiene, energy, food transportation and waste management. I found it interesting to listen how the students were able to integrate their knowledge of the Community with their proposed solutions to the problem. I was given the opportunity to give some feedback to the students and ask any questions that needed to be clarified.
Personally I found the Engineers without Borders challenge of most interest as it provides students the opportunity to learn about other cultures as well as be involved in team work that required communication while developing solutions to problems.

From my experiences in the visitation to UNI SA I can see the possibility of introducing an integrated faculty task. Students within groups, possibly at year 9 level, could study a region of a Third World Country within Africa or Asia as part of their Humanities. For 2 weeks they would study the economy, geography, climate, history etc of their region and then as part of STEM they would design a solution to a problem relating to either Water Supply, Sanitation, Energy, Waste Management etc for 3-4 weeks. At the end of the 5-6 week period the group would present to the rest of the class their solution and justification for their design.

In conclusion I would like to thank UNI SA Mawson Lakes and the Advanced Technology Project for allowing me to be involved in the Teacher in Residence Programme. The time spent in talking with university lecturers, PHD students and listening to undergraduate students has been invaluable.

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