

Inquiry Oriented Learning in Science

Where is Flinders University AFFA Activity at in July 2012? Project Summary and a Reflection on the AFFA Initiative

A Model Building Approach to Optics
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Project Summary July, 2012

As a part of the ALTC fellowship 2011 grant, we are implementing an interactive computer lab (3 hour lab session, week 10) in semester 2 this year, where the students build simulation themselves and explore various aspects of geometric optics (building lens in different shapes, making ray diagrams for lens combinations- bi concave, convex lenses themselves & learning theory behind it) using the Mathematica software. One of the simplest and most useful lens combinations is the astronomical telescope. This computer based lab is configured in such a way to allow students to work alone and to promote their independent learning. After this interactive lab, students perform a laboratory experiment where they build an astronomical telescope (week 12).

We are also trialling an Inquiry-based practical in Semester 2, 2012 as a part of this Fellowship grant and SaMnet Project. One of the practical classes will be changed from a 'recipe' format to an inquiry-based format that drives students to design and execute their own experiment. We will distribute pre lab questions two weeks before this IB-lab to collect students' perception of radiation and radioactivity. The student will acquire prior knowledge through literature, synthesise the information and then design their own experiment incorporating innovation and techniques. In the light of students' feedback, we will be offering a set of lab activities (5) that would be presented to students to choose from. We have a student focus group (n=4) to test these activities before being delivered to the class. The key question to evaluate the effectiveness of this new lab is: What are students' attitudes and perceptions towards inquiry-based practicals compared to traditional, recipe-based practicals. Inquiry-based practical evaluation will involve students completing an anonymous questionnaire. This questionnaire instrument has been used previously in published studies [1]. The questionnaire will be delivered on Flinders Learning online after the completion of all of the practicals. We have just submitted an application for ethics approval for the data collection. At this stage, we are getting support from colleagues from Curtin University, professional staff developer and lab manager at Flinders. We seek to describe the progress of the project so far (findings of the surveys, if possible) at the upcoming ASCME 2012 conference.

¹Chatterjee, S. et.al. Surveying student's Attitudes and Perceptions toward Guided-Inquiry and Open –Inquiry laboratories. Journal of Chemical Education • Vol. 86 No. 12, 2009[1]

The AFFA initiative – A Reflection

At the initial stage of my AFFA activity, I have participated in the workshop dedicated to the inquiry based practical ideas organised by A/Prof. Les Kirkup at the on 30th August 2011. I really enjoyed his workshop. We have tried different methods reaching possibly the same conclusion that my colleagues reached during the workshop here at Flinders. After attending this session, I myself felt little ownership of the experiment. It also gave me an insight how this type of lab can equip first year students with the concepts and skills required in designing an experiment. On his second visit to Flinders in December 2011, we spent a lot of time, discussing various stages of implementation of the project, formation of student focus group, the design of survey instrument, planning timelines etc... Again I found the discipline based teleconference organised by AFFA as most useful platform to share the inquiry oriented based initiatives among its participants. That was really great! AFFA is always in touch with the participants, the assistance AFFA offered really contributed to the progress of my project. Finally, we are trialling an inquiry based lab and interactive computer lab in Semester 2, 2012. The AFFA grant will also enable me to attend the upcoming ASCME conference to present the progress of the project so far.