

Science, Technology and Engineering

VCE Practical Workshops in Biology and Chemistry

Project Title for HEESP Grant

Provide financial support for students in SALT schools in local and regional areas to attend VCE Biology and Chemistry workshops.

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Background

For many years The School of Molecular Sciences has offered VCE practical chemistry workshops which involve the use of specialized chemicals and equipment. These workshops were beneficial to chemistry students through direct student involvement in a laboratory environment while simultaneously addressing VCE school-assessed (SACS) coursework. However, there was no corresponding program for biology students.

Chemistry workshop attendance cost is \$20 with the workshops run on a non-profit basis.

Data from past chemistry workshops indicated that SALT schools were often underrepresented.

HEESP funding was granted for a project aimed at:

- 1) Developing the curriculum for a Biology workshop, publicising its existence and offering it to schools.
- 2) Encouraging greater workshop participation by local and regional SALT schools through direct contact with schools, facilitating booking arrangements and subsidizing workshop fees or travel costs.
- 3) Enhancing the Chemistry workshops and student materials to increase their relevance to the VCE curriculum

This final report provides a summary of the milestones, participation, budget considerations and project evaluation. Appendices present examples of the variety of documentation developed over the life of the project for both Biology and Chemistry

Milestones

The project commenced in February 2009 with the emphasis on developing the Biology curriculum followed by creating and distribution publicity material to selected SALT schools. Its progress has been marked by the continual development of curriculum and workshop student notes, targeted promotional activities and increasing school interest. In a similar vein, the changes made to the Chemistry workshops have been well received with student numbers increasing each year.

During the life of the project, liaison with science faculty staff at La Trobe's regional campuses at Albury-Wodonga and Bendigo has resulted in the chemistry workshops being piloted then becoming a permanent outreach offering at both campuses.

Date	Task	Progress
Feb/March 2009	Curriculum was developed to align with the requirements of VCE Unit 3 in Biology and Chemistry Academics in the School of Molecular Sciences were consulted and contributed in the initial development of the workshops.	Completed
	Flyers were created and distribute to selected SALT Schools inviting them to participate in the Biology Pilot program	Completed
	The workshops were promoted in Chemistry and Biology conferences.	Completed
	Selected SALT schools were contacted to raise awareness of programs and to advise of facilitated participation conditions	On-Going
May 2009	Piloted the "Biology one day workshop"	Completed
	Interim report was written	Completed
March-Sep 2009	Conducted VCE chemistry workshops	Completed for 2009
Sep09-Feb10	Liaised with science staff at regional La Trobe campuses (Bendigo and Albury Wodonga) through provision of curriculum resources, technical backup/support to apply for HEESP grants to pilot some of the VCE programs.	Completed Acquired a HEESP grant to run VCE workshops in Bendigo
Feb-May 2010	Bendigo and Albury Wodonga ran their first pilot programs	Completed
May 2010	Assisted staff at Albury-Wodonga campus to apply for funding to run an outreach program using the curriculum developed for the Melbourne Campus.	Acquired a HEESP grant for Albury-Wodonga
Feb - Sep 2010	VCE workshops continued to run at Bundoora Campus	Completed for 2010

Publicity and Participation

Publicity about the new Biology program was initiated with the creation and distribution of a Flyer (Appendix1) and by presentations at events such as at the VCE Biology Teachers' Conference in February 2010 held at La Trobe.

Student participation in the VCE Biology workshop has increased since its inception as shown below. To date, SALT schools, including one regional school, constitute 100% of the attending schools.

Table1. SALT schools Participating in VCE Pilot Biology Workshops

Year	No. Schools	No. Students
2009	3	54
	Kyneton Secondary College Reservoir District Secondary College Lakeside Secondary College	
2010	3	84
	Northcote Secondary College Coburg Senior High School Ruthven Secondary College	

A general Outreach flyer (Appendix 2) and word-of-mouth are the main publicity streams for the chemistry workshops. These workshops cover three specific study areas, Instrumental Analysis, Organic (Aspirin) synthesis and Water Chemistry.

Participation in these workshops for the period 2008-2010 is shown in the table below. Enhancements were made to each of these workshops as part of this project after each of the 2008 sessions. Participation by SALT schools over the last two years has averaged around 42%, 46% and 58% for the Instrumental, Organic and Water chemistry workshops respectively. Overall participation in the workshops has increased.

Table2. Schools Participation in VCE Chemistry Workshops

Workshop	Dates	No. schools	No. Students
Instrumental Analysis	Feb-Mar 2008	17	256
	Feb-Mar 2009	20	292
	Feb-Mar 2010	18	355
Aspirin Synthesis	May 2008	7	74
	May 2009	10	160
	May 2010	14	252
Water Chemistry	June 2008	9	156
	June 2009	10	185
	June 2010	9	144

*For each of these workshops, renovations to laboratories meant a shortened program operated compared to the previous year. This adversely affected the number of schools/ students which could be accommodated. In 2011 it is anticipated that full length programs will again be the norm.

Table 3 shows SALT schools that were subsidized to attend the VCE chemistry workshops.

Table3. SALT Schools participating in VCE Chemistry Workshops

VCE Program	Date	School	Student numbers
Instrumental Analysis	Feb 2009	Banksia SC	5
		Epping SC	8
Aspirin Synthesis	May 2008	St Helena SC	10
		Diamond Valley College	5
	May 2009	Banksia SC	7
Water Chemistry	June 2009	Wangaratta High School	40
	June 2010	Thomastown SC	13
		Epping SC	17
		Glenroy SC	5
		Lalor SC	22

Budget

Amount granted for this project was \$12000. Funds were spent according to plan.

Detailed Budget Items	Amount spent (\$)
Short term contracts: (demonstrators)	\$2,754.00
Casual staff to develop the biology program and run the revision workshops	\$2,205.36
Technical assistant	\$1,200.00
Administrative costs	\$1,300.00
Equipment/ Maintenance:	
Chemicals and maintain glassware, specialised equipment etc	\$1,900.00
Travel:	
School visits, and regional La Trobe campuses.	\$350.00
Subsidise rural students with transport to La Trobe University	\$1500.00
Other:	
Promotional material, survey preparation, photocopying of notes and flyers	\$990.00
Total:	\$12,199.36

Evaluation

Pilot Biology Workshop

The May 2009 workshop elicited the following student responses:

93% enjoyed the program.

100% said the program helped their understanding of immunology and disease.

73% said the program inspired their interest in a career in this area.

Other comments showed students enjoyed the hands-on aspects of the workshop particularly the use of microscopes. The student notes were received favourably, the interactive revision lecture was very helpful and the staff was very friendly helpful.

Teacher feedback highlighted the close links with the VCE curriculum, usefulness of the student notes, the staff interaction with students and the excellent organization of the day.

Feedback from the May 2010 was a reflection of the above.

Significantly, the establishment of this program has provided VCE students of SALT schools with the opportunity to participate in a Biology workshop in a university environment, a combination which in the past was not readily available to them.

VCE Chemistry Workshops

The principle source of feedback has been from teachers. The major points have been:

1. The fact that La Trobe's programs provide significant opportunity for hands-on student involvement especially in the Aspirin Synthesis and Water Chemistry programs.
2. In Instrumental Analysis, every student gets to see each of the major instruments in operation. This does not happen elsewhere. As a result, more teachers are opting to bring their students to La Trobe.
3. Demonstrator capability, friendliness and the quality of the student notes are constants across all three workshops.

As is evident from the participation in the Biology and Chemistry workshops, both streams are sustainable. This success suggests our workshops are highly sort after. One indication of this is that at the time of writing (December 2010), an unprecedented number of early bookings have been received (14 for the Instrumental Analysis workshop in March 2011 along with five bookings for the Aspirin workshop in May 2011). Another indication is that top non-SALT schools such as MLC and Ruyton Girls College are attending the workshops. In so doing, they are by-passing institutions such as Melbourne University/ Monash University /RMIT where they attended previously.

While this level of interest is heartening, it is important that all schools have the same opportunity to attend the workshops. To ensure this, appropriate funding needs to be maintained to assist and enable attendance by SALT schools.

Through collaboration with staff at the Bendigo and Albury-Wodonga campuses, the scope of this project was expanded to establish pilot programs of the chemistry workshops at these two sites. Successful pilots and additional HEESP funding to each campus has resulted in these workshops being offered annually as part of La Trobe's Outreach activities.

While not directly associated with this grant some additional beneficial outcomes have arisen with the development and conducting of the Biology Program and the enhancement of the Chemistry Program. These are:

1. La Trobe's Outreach efforts and programs are more widely known
2. Networks between La Trobe and a diverse range of secondary schools have been established
3. Having VCE students visit and work in university facilities provides them with a great experience which hopefully translates in increased student interest in studying here.
4. The interaction between students and demonstrators (some of whom are current postgraduates) enables postgraduates to put something back into the university while simultaneously enhancing their own skill set.
5. La Trobe's interest in providing a meaningful educational experience for students from a diverse range of schools can only enhance the university's status among secondary schools and their staff.

Conclusion

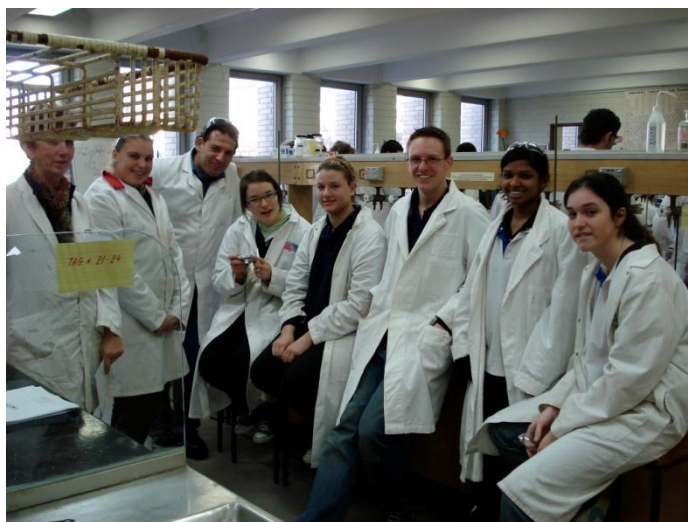
The development, promotion and establishment of the VCE Biology Program has shown it to be a successful model for engaging students and staff of local and regional SALT schools in VCE science. This program also led to the enhancement of the chemistry workshops in terms of curriculum alignment, relevance and better student notes.

Increasing participation in each of the workshops offered confirms their appeal. As a result, each workshop is sustainable. Nevertheless, in the interest of equity, it is recommended that an appropriate level of funding be maintained to ensure equal access opportunity for SALT schools.

This project has also helped to spread the adoption of the VCE Chemistry workshops to La Trobe's Bendigo and Albury-Wodonga campuses.

The basic elements of the VCE Biology Program such as direct contact with schools, planned publicity / awareness events and facilitating contact with the university can be readily adapted to foster schools' interest in other VCE subjects.

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- Appendix 1 VCE Biology flyer for schools
 - Appendix 2 General Outreach Flyer
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 - Instrumental Analysis
 - Aspirin Synthesis
 - Water Chemistry
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Epping Secondary College