

**Not for publication**

# Office for Learning and Teaching

## Networks

Year 1 / Stage 1 Report September 30, 2012

Chemistry Discipline Network SI11-2118

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Please refer to the document, *Project Management Information*, available on the OLT website, <http://www.olt.gov.au/grants-and-projects/project-management>, for information on completing and submitting reports.

# 1 Review of Progress

In this section, describe your progress against the specified outcomes and deliverables of your network based on the funding agreement.

At the Year 1 stage of a network, you would be expected to have achieved all of the following.

Quick check list [✓ or n/a]

## **Network management and planning**

Appointed a network manager/officer and/or established a reference group	[✓ ]
Established terms of reference	[✓ ]
Developed a communications and networking strategy	[✓ ]
Prepared an evaluation plan	[ ✓ ]
Prepared a dissemination plan	[ ✓ ]

## **Network implementation**

Obtained ethics approval	[✓ ]
Identified and established wider networking links	[ ✓ ]
Developed a communications and networking tool	[✓ ]
Identified ongoing publication and presentation opportunities	[ ✓ ]
Conducted mapping exercises	[ ✓ ]
Completed interview/survey design	[✓ ]
Conducted a data collection	[✓ ]
Conducted a data analysis	[ ✓ ]
Considered dissemination of results/progress to date	[ ✓ ]

Please include further details in the appropriate sections below. Do not include details that were reported in the six-month report.

## 1.1 Progress against specified outcomes and deliverables

(Please specify the number of network members and the representation of higher education institutions)

Current membership: 101 members, representing 37 Australian and 3 international universities  
The Chemistry Discipline Network (ChemNet) has directly contributed to active discussions within the chemistry academic community in Australia on topics including assessment (multiple choice and non-MC), practicals, the philosophy of science, use of learning management systems, plagiarism in the age of the internet, etc. Discussions have occurred at numerous conferences including the RACI Inorganic Chemistry, Physical Chemistry and Chemical Education conferences. There have been presentations on the Chemistry Discipline Network at the Australian Conference on Science and Mathematics Education, the RACI Chemical Education conference and the annual ACDS L&T meeting. The network grew rapidly in the first few months, and membership is currently increasing more slowly but steadily, with approximately 2 new members per month.

## 1.2 Describe the involvement of network partners

We have approximately 25 members currently actively involved in working groups dealing with mapping of chemistry subjects, Threshold Learning Outcomes (TLOs) and, separately, Standards. Currently ChemNet is focussed on taking the Chemistry TLOs via a stepwise development through to assessable standards (TLO → standards). Two mapping exercises and skype meetings of the TLO working group have lead to the first meeting to examine the TLOs to determine possible assessment to meet standards which demonstrate mastery. This took place during the annual ACSME Discipline Day, comprising a three hour meeting of 32 members of the Australian chemistry academic community. Progress was made on some of the Chemistry TLOs. Future discussions are being put in place to continue the TLO → standards work.

Many of our members met in Adelaide at the Chemical Education Conference in July 2012.

We presented progress of our network at the meeting of the Australian Council of Deans of Science Learning and Teaching meeting in July 2012.

We hold monthly skype meetings at which general business is discussed and members have the opportunity to bring up any issues. These regular meetings keep things moving forwards for the network.

## 1.3 Major achievements against schedule/network brief

(a) We have completed a snapshot mapping of all chemistry subjects (units of study) as taught at 12 universities in Australia in 2011. The report on this mapping exercise has been released on our website and is provided as an appendix. The following data were gathered for each chemistry subject at each participating institution:

1. year level
2. subject code name
3. internal or distance
4. core or elective or for chem major
5. prerequisites for entry
6. content description
7. textbooks
8. % Organic, % Inorganic, % Physical, % Analytical, % Biochem, % Gen Chem, % non-chemistry content

Face to face activity:

1. total lecture hours
2. total tutorial/workshop/PASS hours
3. field trip

4. total prac hours
5. total contact hours
6. use of clickers

#### Assessments

1. prac report format
2. prac assessment %
3. assignment/workshop/tutorial %
4. mid semester exam(s) %
5. presentations (poster/oral/vlog) %
6. final exam %
7. assessment group work %
8. % of all assessment that is MCQ

#### Other

1. approx numbers 2011

This mapping exercise reflects that across the participating institutions, content of the first year subjects are similar, but several different themes with varying emphases of the chemistry subdisciplines, are offered at the third year. Differences between institutions are also apparent in contact hours, face to face activities, group work and assessment types. This snapshot provides very valuable information on the variety of degree programmes on offer. This must be taken into account in the TLO → standards work.

(b) We have also completed the mapping of all first year subjects in the BSc(chem) against the Chemistry TLOs, at six universities in Australia. This mapping is being undertaken to illustrate the extent to which content and activities currently delivered and assessed address each of the TLOs. This mapping is currently continuing to cover second and third year subjects. This is valuable supporting material for the working group developing the assessable standards. The report on this exercise, which includes units that are compulsory for BSc students but not chemistry units, has been released on our website and is included as an appendix.

These two reports are major achievements and the interest in them, from Heads of Disciplines, Heads of Schools and Deans demonstrates that we are achieving important outcomes for tertiary chemistry teaching in Australia. The importance of these reports for the TLO → standards work cannot be understated. They also form a substantial base for the RACI as this organisation moves forward with its new accreditation processes. The incoming President of the RACI is also closely involved with the TLO mapping work.

(c) The Director has guest edited a Special Issue of the Australian Journal of Education in Chemistry, on the theme of Networks in Tertiary Chemistry Education. Invited submissions were received from several international researchers and the issue is due to appear in early October.

(d) ChemNet held a Symposium on Benchmarking and Standardised Exams at the Chemical Education Conference in Adelaide in July 2012. This was very successful and brought together national and international researchers, and stimulated discussion on the possibilities for using some standardised assessment in Australian tertiary chemistry.

(e) ChemNet at Discipline Day, ACSME 2012; TLO → standards work, the next step. A structured 3 hr workshop was run to discuss the main chemistry discipline “body of knowledge” TLOs, namely TLO 1.1 and TLO 2.2. Groups were formed to discuss these TLOs from two points of view – (i) depth and breadth, and (ii) possible assessment. Members of the TLO working group and others with background knowledge introduced the TLOs and the issues to be discussed, group

members' discussions were recorded to be summarised, groups reported back to the meeting and general discussion was also noted. The summarised materials and the outcomes and progress of activity will be discussed by the TLO working group to determine the form of the next [round of activity](#). The activities of other discipline groups also in the TLO → standards space will also be taken into account in determining the next steps.

## 1.4 Lessons learnt

The website has not proved to be very popular as a communication tool, and people are more likely to respond to personal emails. However, it is a useful place to have copies of all relevant documents (from us and other groups) available for download. The skype meetings are more popular; it seems that people may not have the time or energy to write something but are interested to listen and share their views in order to keep abreast of our activities.

## 1.5 Challenges met

The Director, Madeleine Schultz, relocated to Germany in July 2012. Although we already conducted many meetings over skype, this has been a major challenge because of the time difference. We initially developed our website internally but due to time constraints now require a developer to ensure it remains useful. So far it has been difficult to find a suitable person.

## 1.6 Indicate if and how these challenges will have an impact on the outcomes, the timeline or the budget?

Glennys O'Brien has become Co-Director and so there should not be any impacts due to Madeleine's move.

# 2 Formative Evaluation

## 2.1 What formative evaluation processes are being used?

We have established a small reference group of experienced science educators, who are providing feedback on our Network activities. The evaluators are using the ALTC Project Evaluation Resource, with modifications to reflect the goals of the network.

## 2.2 What have you learnt from these processes thus far?

The feedback has been very positive - the Chemistry Discipline Network is very active and has achieved significant outcomes that were planned in the initial application. We have been recognised by the OLT, a major stakeholder, as well as by the communities of chemistry and science educators. One important suggestion is for our network to have official recognition from Deans and Assistant Deans for Learning and Teaching. This will form part of our activities in the second year.

# 3 Dissemination

## 3.1 What dissemination activities have you undertaken?

The two reports described above have been released on the website, and an email was sent to heads of Schools at all Australian universities with the link.

The RACI Symposium in Adelaide included reports on the two mapping exercises. Activities and progress were reported to ACDS, L&T, July 2012 meeting.

The major meeting on September 26, at the Discipline Day of the Australian Conference of Science and Mathematics Education, forms an important part of the dissemination within the chemistry community.

The activities regarding continued TLO → standards work, especially based on the two mapping exercises were reported as a paper delivered to the 2012 ACSME conference, 27 Sep 2012. ChemNet has taken part in the SAMNET led discipline directors meetings (Hobart, July 2012, Sydney 27 Sep 2012).

Further dissemination strategies are in progress according to the D cubed framework from Dannaway, as follows:

- We are engaged by disseminating during the project, to a variety of audiences: Deans (through the ACDS T&L meetings), chemistry teachers (members of our networks and others with whom we interact at conferences and day-to-day), educators in other science disciplines (through the ACSME meetings and also in our day-to-day work). Dissemination is also conducted through informal discussions of colleagues at meetings based around other subdisciplines of chemistry.
- Transfer of our achievements to other science discipline networks is already occurring, with important discussions with discipline networks including mathematics and biology.
- The climate is ripe for change, with the advent of TEQSA and the Higher Education Standards Panel. There is also change occurring in the RACI accreditation process, so dissemination of our outcomes throughout the chemistry community is timely.

## 4 Impact

### 4.1 Is there any evidence of the impact of your network?

If yes, where and how?

The Network has been recognised both by the Royal Australian Chemical Institute and the Australian Council of Deans of Science as the key player in establishing standards and assessment of threshold learning outcomes, and helping develop new accreditation standards.

Our membership has increased through word of mouth and there is a steady stream of email traffic and discussion of Network activities among the chemistry academic community, between the directors and individuals around Australia, and also through the project officer. Over 30 people attended our first meeting in October 2011 and a similar number attended the meeting in September 2012.

One of our goals was to improve communication between academics at smaller, regional universities who are often isolated with very small chemistry departments. Evidence of the impact of the network is that three such people, from UNE, JCU (Cairns) and SCU attended several of our meetings and discussed their teaching with others. Two of these attended the Australian Conference on Science and Mathematics Education and our associated general meeting in September 2012.

For academics who are new to the Scholarship of Teaching and Learning and for those who have already been working in the field, the network has proved to be a way to generate fruitful discussions and to get to know people (in person and virtually).

## Events

Provide details of events, other than network team meetings, held during the period.

Event date	Event title and host city	Brief description of purpose of event	Number of:		
			Participants	HEI represented	Other institutions represented
29/2	skype meeting	update from working groups	10	8	
28/3	skype meeting	update from working groups	10	8	
2/5	skype meeting	update from working groups	9	8	
20/5	skype meeting	update from working groups	7	6	
27/6	skype meeting	update from working groups	4	2	
2/7	Symposium Adelaide	Discussion on Benchmarking and standardised exams to assess chemistry	85	30	
19-20/7	ACDS L&T conference, Sydney	Meeting of Deans of Science with leaders of Discipline Networks	50	20	
25/7	skype meeting	update from working groups	10	9	
29/8	skype meeting	update from working groups	6	5	
26/9	Discipline Day, U Sydney	Workshop on how to assess TLOs at ACSME conference	35	20	

Provide details of events planned over the next six months.

Event date	Event title and host city	Brief description of purpose of event
monthly skype meetings		Continue progress of all working groups and maintain open communication.
Nov, 2012	Follow up to ACSME meeting, Sydney, TLO → standards work	This meeting will bring together the outcomes of the workshop on Sept 26 and continue developing specific exemplars. We will invite senior chemistry educators from each subdiscipline to ensure that the outcomes are recognised.
Feb, 2013	TLO → standards work, Melbourne	This will be the third meeting in this series, and will result in a report on how to assess TLOs for chemistry.

## 5 International collaboration

Provide details of any international collaboration or fora where the network has been represented.

Event date	Event title	Location - city and country	Brief description of participation
16/4/12	Higher Education Academy meeting	London, England	Glennys O'Brien met with Paul Yates, the Physical Science Leader of the Higher Education Academy in the UK. They discussed the formation and activities of a successful network.
17-21/7/12	International conference on chemical education	Rome, Italy	Several network members participated in this conference. One oral presentation included results from the mapping exercise.

## 6 Requests for approval of proposed amendments

Any proposal to significantly change the planned activities or implementation from the original proposal, including any reallocation of budget, needs to be approved by the OLT. Refer to Part 9 of this report for revisions to budget.



## 7 Financial statement acquittal of funds

All expenditure should be reported in whole dollars, exclusive of GST.

	Year 1 / Stage 1 <sup>1</sup>			Balance \$
	Budget \$	Expenditure		
		Actual \$	Committed <sup>2</sup> \$	
<b>Personnel</b>				
Project officer	37,500	26,999		(10501)
<b>Sub total</b>	<i>37,5000</i>	<i>26,999</i>		<i>(10501)<sup>1</sup></i>
<b>Project support</b>				
Printing/publishing	1000	400		(600)
Website costs	1500	743		(757)
<b>Sub total</b>	<i>2500</i>	<i>1143</i>		<i>(1357)<sup>2</sup></i>
<b>Project activities</b>				
Member travel	10,000	7979	2442	421
<b>Sub total</b>	<i>10,000</i>	<i>7979</i>	<i>2442</i>	<i>421</i>
<b>Institutional overhead levy</b>				
<b>Sub Total</b>				
<b>Total Year 1/Stage 1</b>	50,000	36,121		(11,437)

Footnotes:

1. The project officer was not recruited until part-way through the project's first year, and receives a lower salary than originally budgeted for

2. Project support costs were lower than anticipated

Please footnote this table to describe any major differences between the budgeted figure and actual expenditure (for variations greater than plus or minus \$500). Please see the *Financial Statements Frequently Asked Questions* [documents](#) for assistance in completing this table.

<sup>1</sup> Where the report does not cover a full year of expenses, please note the timeframe of the report

<sup>2</sup> Committed expenditure represents funds for purchases or personnel costs that have already occurred and are awaiting invoices/payments.

## 8 Revised budget for Year 2 / Stage 2

A revised budget is required if more than 10% of Year 1/Stage 1 funds are being carried forward.

All expenditure should be reported in whole dollars, exclusive of GST.

	Year 2 / Stage 2		
	Balance end of Year 1 / Stage 1 \$	Budget Year 2 / Stage 2 \$	Balance Start of Year 2 / Stage 2 \$
<b>Personnel</b>			
Project officer	(10,501)	37,500	26,999
Web developer		5000	5000
<b>Sub total</b>	<i>(10,501)</i>	<i>42,500</i>	<i>31,999</i>
<b>Project support</b>			
Printing/publishing	(600)	1000	400
Website costs	(757)		(757)
<b>Sub total</b>	<i>(1357)</i>	<i>1000</i>	<i>(357)</i>
<b>Project activities</b>			
Member travel	421	17937	18358
<b>Sub total</b>	<i>421</i>	<i>17937</i>	<i>18358</i>
<b>Institutional overhead levy Sub Total</b>			
<b>TOTAL</b>	<i>(11,437)</i>	<i>61,437</i>	<i>50,000</i>

## 9 Appendices

Reports on the mapping exercises.

## 10 Certification

### ***Certification by network leader***

I certify that this is an accurate representation of the progress of the network.

Network leader: .....

Signature: ..... Date: .....

### ***Certification by DVC/PVC (Academic), or equivalent, or official delegate***

I acknowledge submission of this Progress Report.

Full name: .....

Position: .....

Signature: ..... Date: .....

Please submit report via the OLT online portal: [OLT Grants Management Portal](#)