Independent evaluation of the
In2science Peer Mentoring Program

Final report

Report prepared for the sponsors and management of

In2science

La Trobe University and the University of Melbourne

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Centre for the Study of Higher Education
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Executive summary

This report is the result of an independent evaluation of the *In2science Peer Mentoring Program* by the Centre for the Study of Higher Education (CSHE) at the University of Melbourne. The study examines the effectiveness of the current program, the benefits for peer mentors, schools and teachers, and offers recommendations for strengthening the program in the future.

Modelled on the STAR programme in Western Australia, the *In2science Peer Mentoring Program* places science-based university students from two Victorian universities as mentors in secondary schools in and around Melbourne. It is a requirement that mentors have completed at least one year of university and that they express a genuine interest in helping students in both their understanding of, and motivation for, science and mathematics learning.

All *In2science* peer mentors, including those involved only in 2004, were surveyed by questionnaire. A 50 per cent response rate was achieved (n=31/60). The participation rate from teachers involved in the program was substantially lower. From the twelve schools willing to participate in the study, only six teachers agreed to be interviewed and timing was such that only two teachers were able to distribute questionnaires to school students. For this reason the report draws only from the responses of mentors and teachers.

When there is an effective match between mentor and teacher, *In2science* peer mentoring delivers positive outcomes for mentors and teachers and there is some indication that there is a positive effect on the attitudes of students towards science itself. While this study cannot directly assess the outcomes for students, there were indications from teachers and mentors that *In2science* peer mentoring may also aid student learning.

In addition, the study has identified ways in which the benefits of *In2science* may be significantly enhanced. Improving information provision to classroom teachers and overcoming their acute lack of available time would ultimately improve outcomes for all stakeholders. Solutions to overcoming these challenges are, of course, dependent upon the amount of funding support available to the program.

Findings

The role and contribution of mentors in the classroom

- Mentors came from a range of tertiary backgrounds; however, most mentors studying a Bachelor of Science were placed in science classes, while the mentors placed in mathematics classes were typically studying the enabling sciences as part of a science/education degree.
- According to mentors their most important role was to ‘provide assistance to students’, with ‘motivating’ and ‘enthusing’ students also rated as important;
- Teachers particularly valued the potential of mentors as role models for their students. In this sense, students’ perception of the mentor as ‘not a teacher’ was seen to be integral to the success of mentoring, from the point of view of both mentors and teachers. Teachers also highly valued the ability of some mentors to show their students that science is not ‘daggy’ or ‘nerdy’.
- Showing initiative and being proactive in the classroom (without taking over) was the attribute teachers valued most highly in a mentor.

The benefits and rewards of peer mentoring

- Peer mentors were extremely positive about their experiences of *In2science* and gained significant satisfaction simply from being able to help students. An added personal benefit from participation, reported by mentors, was increased skills in explaining science to others;

- Mentors often became involved with *In2science* in order to get a 'taste' of teaching and many found the program extremely useful in helping them to decide whether or not they would like to pursue a career in education.

The issues for mentors, teachers and *In2science*

- According to mentors, classroom teachers need to be better informed about the role of the mentor and the purpose of *In2science*. Teachers' lack of information was a source of frustration for mentors and they commonly described being underused and/or undervalued by teachers;
- Mentors and teachers frequently had mismatched expectations of each other's roles; for example, mentors often expected teachers to plan lessons taking into account the mentor's presence;
- Time is the most challenging factor in maximising the effectiveness of *In2science*. Teachers' reported that lack of time significantly affected their ability to make the most of the program;

Recommendations

The following recommendations for improving and enhancing the *In2science Peer Mentoring Program* address the two principal challenges identified by the study: what mentors regarded as teachers' lack of information about the program and the related issue of teachers' lack of time. Indeed, even those teachers who were singularly enthusiastic about *In2science* reported that they were not able to utilise the program as much as they would like due to time constraints.

1. *In2science* reviews the current structure and process of information provision to classroom teachers and examine ways to improve the flow of information;

2. *In2science* produces a targeted *Communication Pack** for teachers and mentors to give structure to conversations about expectations in areas such as roles, contribution, responsibilities and outcomes;

3. *In2science* encourages teaching relief for participating teachers, if only for one period at the beginning and end of each placement, for teacher-mentor meetings/debrief. This may require giving consideration to funding support for schools;

4. *In2science* considers expanding the opportunities for the program to promote teaching as a possible career path for university science students.

The Communication Pack*

The lack of time and information identified in this report leads to differences in understandings of the program and its purpose between mentors and teachers. A way to overcome these misunderstandings would be to provide both mentors and teachers with a pack that directs their communication throughout the placement. It could contain such things as a checklist that both could fill out at the start of the placement that asks each to provide their expectations of each other and their roles. These should be structured around such questions as:

- Should the teacher provide the mentor with a lesson plan prior to the class?
- Should the mentor work with all students or a group/individuals the teacher has identified?
- How proactive does the teacher expect the mentor to be?
- What is the mentor hoping to get out of the placement?
- What is the teacher hoping to get out of the placement?

It would also be of benefit for the teacher to have a good understanding not only of the mentor's educational background, but of their career aspirations. A teacher may conduct a placement differently if the mentor is, for example, planning to move into a career in teaching.

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Context of the study

Secondary school science and mathematics education is a recognised priority area in Australia as is evident in the number of studies and government inquiries undertaken in recent years. The primary focus of many of these reports has been upon teachers, including the key role of teachers and the learning environment in inspiring student engagement[1]. For example

- *Clever Teachers, Clever Sciences*[2], which explored the nature of effective university preparation of teachers of science and mathematics.
- *Australia's Teachers: Australia's Future*[3], which also examined teacher preparation and the needs of schools. The DEST report emphasised the importance of students' school experience of science and mathematics in terms of the study and career choices they make in later years.
- *Who's Teaching Science?*[4], which provided a snapshot of secondary school science teachers, including details of their tertiary preparation, attitudes and motivations for joining the teaching profession.
- *Inquiry into the Promotion of Mathematics and Science Education*[5], which emphasised the variability in school students' participation, achievement and experience of science and mathematics in Victoria. Student engagement was "one of the strongest themes"[6] arising from this state-based inquiry.

One factor driving the interest in science and mathematics education has been the decline in the proportion of Year 12 students electing to study physics, chemistry and advanced mathematics subjects[7]. The consequent decline in the number of enrolments in science and mathematics studies at university has raised concern among industry, business and educational organisations alike[8].

Programs that link tertiary students with school teachers and school students illustrate one approach to supporting science and mathematics teaching in schools. While these university-to-school programs have various objectives, they typically have 'generating enthusiasm for science' as a central goal. Several such programs are currently operating in Australia[9], including the long-running *STAR Peer Tutoring Programme* in Western Australia[10].

Most of the Australian university-to-school mentoring programs involve university students studying in the areas of science and mathematics. These students volunteer as 'peer mentors' (or 'peer tutors'), spending time in schools working alongside students in science and mathematics classes. The mentors support student learning, but in a role quite distinct from that of the teacher. Mentors serve as role models for learning generally, and for learning in the sciences and mathematics more specifically.

Such university-to-school peer mentoring programs may also benefit science and mathematics education by exposing university students to the possibilities of school teaching as a career[11]. An ongoing study of the STAR peer-tutoring programme has recently identified such effects upon science-based peer tutors[12]

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[1] ETC, Parliament of Victoria (2006)
[2] Lawrence & Palmer (2003)
[3] DEST (2003)
[4] Harris, Jensz & Baldwin (2005)
[5] ETC, Parliament of Victoria (2006)
[6] ETC, Parliament of Victoria (2006). page xvii
[7] DEST (2003)
[8] ETC, Parliament of Victoria (2006)
[9] See ETC, Parliament of Victoria (2006) for an overview of Australian university-to-school mentoring programs.
[10] Science and Technology Awareness Raising (STAR) peer-tutoring programme has been operating from Murdoch University in Perth since 1994. http://about.murdoch.edu.au/star/intro.html
[11] Lawrence & Palmer (2003) page 179
[12] unpublished data from an in-progress study of the STAR program being carried out by CSHE.

In placing university students in secondary schools the *In2science* program has four stated principal aims:

1. To generate enthusiasm for Science (especially the enabling subjects of Chemistry, Physics and Mathematics) in students in the middle years of their secondary education (Yr 7-10).
2. To place university students in schools to act as positive role models to secondary school science students, inspiring them to achieve their potential.
3. Through the role models, promote the value and rewards of Science as a positive career choice.
4. To foster links between schools and universities.

Peer Mentors work closely with the class teacher to provide support for the lesson, especially practical classes.

Excerpt from information about the *In2science* program, provided on the program's website*
*Accessed 12/4/06 http://www.latrobe.edu.au/scitecheng/mentoring/index.html

Chapter 1: The evaluation method

1.1 Purpose

2005 was the second year in the operation of the *In2science Peer Mentoring Program*, and the *In2science* Board of Management sought empirical evidence of the effectiveness of the program. The aim was to obtain sufficient data from school students, teachers and peer mentors to evaluate the effect of the program on all participants. It was envisaged that such information would inform the development of a 'prospectus' for the consolidation and growth of *In2science*.

Various circumstances and events limited the data collection possible, and ultimately led to a decision to restrict the scope of the study. By the time the necessary ethics and government approvals were received and school principals invited to participate, it was late in the 2005 school year. With the permission of twelve schools, teachers were contacted and invited to participate. However, many declined or simply did not reply. Among those who declined, the most commonly cited reason was lack of time and the approaching end-of-school-year commitments. Further efforts to elicit school involvement in early 2006 were largely unsuccessful. The timing of school holidays and consequent delayed placement of mentors for school Semester One also appears to have been a factor in the limited response received from teachers in 2006.

With the reduction in scope, the objectives of the study were adapted accordingly. The study draws primarily upon data obtained in a survey of mentors, with limited input from teachers. The analysis and report provide an insight into the effect of involvement in the program upon mentors, and the role of both mentors and teachers in effective peer mentoring placements. With very few students surveyed, insights into the effect upon school students are necessarily indirect, relying upon the perspectives of mentors and teachers.

The study addresses the following questions:

- What motivated mentors to become involved in *In2science*?
- How did mentors perceive their role in the classroom? Were their views shared by teachers?
- What aspects of their involvement in *In2science* did mentors find most rewarding?
- Did teachers identify any effect upon their teaching or their students from having a peer mentor in their class?
- What opportunities and challenges do mentors and teachers identify that might inform program planning?

1.2 Methodology

The study involved:

- A survey of peer mentors by questionnaire;
- Interviews with schools teachers who had hosted peer mentors in 2004 and/or 2005; and
- A survey of school students by questionnaire.

Ethics and education authority approvals

Approval of the research was sought obtained from the University of Melbourne Human Research Ethics committee. The Victorian government Department of Education and

Training granted permission for government schools to be involved, conditional upon the approval of individual school Principals.

Study participants

Peer mentors
The coordinator of *In2science* provided a contact list for peer mentors. In October 2005, questionnaires were sent by regular post and email to all 60 listed peer mentors. The list included 37 'current' and 23 'past' peer mentors (see Box 1).

Responses were received from 24 current and 7 past mentors.

Schools
The coordinator of *In2science* provided a contact list for 17 schools involved in the *In2science* program. All listed schools were contacted in November and invited to participate in the study.

The principals of twelve schools granted permission for us to contact their schools' teachers and students. Two schools declined, and three did not respond.

Teachers
Invitations were sent to the *In2science* Link teachers at each of the twelve schools in November 2005. Via the Link teachers, invitations were provided for distribution to other teachers involved in *In2science*. Reminders and repeat invitations were sent during December 2005, and again in March 2006. However, the response rate was low and in consultation with the management of *In2science*, a decision was taken in March 2006 not to pursue teachers further.

A total of six teachers from three schools were interviewed.

School students
Two teachers in one school agreed to distribute questionnaires to students in their year 7 and 8 classes in December 2005.

Completed questionnaires were received from thirteen students.

Survey of peer mentors
The questionnaires distributed to peer mentors included both open questions and Likert-style items. The questions were designed to elicit information on each peer mentor's:

- field of university study;
- reasons for choosing that field;
- other involvement in university life;
- reasons/motivation for their involvement with *In2science*;
- year level and subject of the host classes;
- perceptions of the role of peer mentors;
- experiences of peer mentoring;
- self-assessment of their skills development through involvement with *In2science*;
- plans for the next five years; and
- influence of their experience with *In2science* on their plans.

Interviews with school teachers

The teachers interviewed were each asked the same suite of questions in a semi-structured format. The interviewer sought information on each teacher's:

- history of involvement with *In2science*;
- perceptions of the role of peer mentors;
- observations regarding the effect of peer mentors on school students;
- description of the effect on teachers and teaching of hosting a peer mentor;
- perceptions of the effect of peer mentoring upon mentors; and

- overall impressions of the program.

Survey of school students

The questionnaires included both open questions and Likert-style items. The questions were designed to elicit information on the students':

- interest in science and mathematics;
- perceptions of the value of having a peer mentor in their class;
- familiarity with their mentors;
- perceptions of the role of peer mentors;
- plans after secondary school.

Data analysis

Questionnaire responses were coded and entered into electronic databases for analysis. Interviews were summarised and the responses coded for identification of emergent themes. In addition, interviews were treated as individual 'case studies' for purposes of illustration.

Due to the modest size of the dataset, statistical analyses were not performed.

Box 1: Definitions of selected terms used in this report

Peer mentor: university student involved in *In2science* as a peer mentor.

Mentor: synonymous with *peer mentor* in this report.

Current peer mentor: listed as a peer mentor for the second half of 2005.

Past peer mentor: listed as a peer mentor for 2004 or the first half of 2005, only.

***In2science* management**: the coordinator and board involved in management of the *In2science* program. In 2005-6 the coordinator was Mr John MacDonald.

Link teacher: Secondary school teacher nominated as the principal *In2science* contact at each school. Typically, Link teachers coordinated mentor placements within the school, in consultation with *In2science* management

Teacher: Secondary school teacher who had hosted one or more peer mentors.

Student: Secondary school student.

Chapter 2: The mentors and teachers surveyed

As background to the discussion of the roles and experiences of mentors and teachers in the program, this chapter briefly describes the characteristics of the mentors and teachers surveyed.

Mentors were asked to describe their current university studies, including:

- the transition from school to university (i.e., did they follow a 'traditional entry pathway, moving directly to university from school, or was there a break of a year or more); and
- their course of study, including major subject area.

In addition, mentors were asked to list the range of their *In2science* mentoring experiences, including:

- their reason(s) for being involved;
- the number of semesters that they had been involved; and
- the subjects and year levels of the classes they were placed with.

Information on teachers includes their length of time involved with the program, the classes for which they had peer mentors, and whether they were (or had) served as *In2science* Link teacher in their school.

2.1 Mentors' studies at university

The mentors surveyed were from either La Trobe University or the University of Melbourne, as these were the two institutions involved in the program at the time of the study. They represented a range of university 'year levels', from second year undergraduate students to PhD candidates (Table 2.1).

Table 2.1 Year of commencement at university for the 31 mentors surveyed

	Commenced at university (year)				
	prior to 2001	2001	2002	2003	2004
Number of mentors	2	4	7	8	10

Most of the mentors (n=22/31) were 'traditional entry' students, having commenced university in the year after completing secondary school. Five others had taken a one-year break between school and university, while four had a gap of between two and eight years between school and university.

All the mentors were studying in the sciences. The majority (n=27/31) were studying or had completed a Bachelor of Science, while the remaining four were in the fields of engineering or the health sciences. Half of the mentors were majoring in the life sciences (n=15/31) (Table 2.2). Another eight were studying the enabling sciences, predominantly chemistry and mathematics (Table 2.3), while four were studying across both fields.

Nearly one quarter of the group (n=7/31) were enrolled in a combined science/education degree, and predominantly majored in the enabling sciences (Table 2.2).

2.2 Mentors' motivation for joining the *In2science* program

While most of the mentors had volunteered to be part of *In2science* (n=26/31), some (n=5) stated that participation in the program was a compulsory part of their university studies. However, those for whom the program was compulsory also stated that they were pleased to be involved.

Table 2.2 Disciplinary background and degree-type of mentors, and the subjects they were placed with in schools.

Major area of university study	Bachelor of Science (not combined with Bachelor of Education) (no. of mentors)		Bachelor of Science / Bachelor of Education (no. of mentors)		Other Bachelor (ie engineering or optometry) (no. of mentors)	
	total	school subject placements[1]	total	school subject placements[1]	total	school subject placements[1]
Life sciences	15	S=11 B=2 S,B=1 S,M=1				
Enabling sciences[2]	3	S,M=2 M=1	5	S,M=5		
Both life and enabling sciences	2	S,M=1 S,B,C,P =1	2	S=2		
					4	S,M=2 S,B=1 B=1

[1] S=science; B=biology; M=mathematics; C=chemistry; P=physics
[2] physical sciences and mathematics are often grouped and referred to as the 'enabling sciences'

Table 2.3 Subject areas studied at university by the 27 Bachelor of Science mentors involved in this study

		Number of mentors studying these subject areas[1]	
Life sciences	Biology and closely related studies (e.g., ecology)	9	19
	Genetics	5	
	Biochemistry, pharmacology or health science-related subject	6	
	Psychology	1	
Enabling sciences[2]	Mathematics	7	12
	Physics	2	
	Chemistry	8	

[1] several mentors listed multiple areas of study, and 4 mentors were studying across both the life and enabling sciences
[2] physical sciences and mathematics are often grouped and referred to as the 'enabling sciences'

Table 2.4 Timing of the mentors' placement in schools, based on university semesters

2004 Sem2	2005 Sem1	2005 Sem2	Period of involvement in *In2science* (number of mentors)
			3
			1
			4
			8
			15

The most commonly stated motivation for peer-mentoring was to gain teaching experience. The influence of this experience on the attitudes of these mentors to a teaching career is discussed further in Chapter 4.

> I am interested in teaching as a possible career, but I'm still not sure *(BSc student in the enabling sciences)*

> It's compulsory for my course … so I volunteered this year to boost my confidence and get a feel of what it's like in the classroom besides teaching the subject *(science/science education student in the enabling sciences)*
>
> Get an idea of what it feels like to be a teacher and to step out of my comfort zone *(sciences students in the life/health sciences)*

Some mentors (n=7) cited 'resume building' as a motivating factor.

> Volunteer work, for my resume, which was science related *(BSc student in the life sciences)*
>
> Good experience. I am interested in science communication. I also thought it would help in my post-grad applications *(science student in life/heath sciences)*
>
> Because it will be credited as community service through SALP (Student Ambassador Leadership Program) AND because I wanted to promote science to others *(science/arts student in the life/health sciences)*

A desire to promote science or to help students learn science was also an influencing factor for some (n=6)

> I felt the program was a positive way to generate interest in science in early secondary school students *(BSc Honours student in the life sciences)*

2.3 Mentors' placement in schools

Most respondents had been peer mentors for no more than one university semester (Table 2.4), and most were actively involved at the time of the survey in Semester 2, 2005.

The school classes in which the mentors had been placed were predominantly Years 7 to 10 science or mathematics (Table 2.5). Science classes hosted mentors from a range of tertiary backgrounds (Table 2.2). However, the mentors placed in mathematics classes were typically those studying the enabling sciences at university, including most (n=5/7) of the mentors enrolled in a science/education combination degree.

Table 2.5 Subject and year level school placements of mentors

		Classes in which mentors were placed (no. of mentors)[1]					
School year level	Total	Science	Mathe-matics	Biology	Chem-istry	Physics	other
7	13	11	2				
8	10	10	2				
9	14	10	2	2			
10	16	11	6	3	1	1	
10*	2			2			
11	4			3			1
12	0						

[1] Many mentors had experienced placements in multiple subjects and year levels
* 'advanced' class

2.4 Profile of the teachers surveyed

Six teachers were interviewed. These teachers were from three of the twelve participating schools. Three of the teachers (all from one school) were interviewed at the same time. In summary, the group of teachers included:

- the Link teacher from one of the schools;
- teachers of general science and mathematics;
- one male and five female teachers; and
- teachers with extensive teaching experience (up to 27 years) and those in the early stages of their teaching careers

Chapter 3: The role and contribution of peer mentors

This chapter examines the perceptions of both peer mentors and teachers regarding the role of peer mentors in the classroom.

A principal aim of the *In2science* program is to encourage a positive attitude toward science and mathematics among secondary school students. It is envisaged that peer mentors may directly 'promote enthusiasm and interest' by sharing their enthusiasm for science, mathematics and learning more generally. Peer mentors may also make an indirect contribution: by supporting the classroom teacher, assisting students individually or making possible new and creative activities.

The study sought to discover how the mentors and teachers interpreted the role of peer mentors, independent of the stated aims of the program. Mentors and teachers were explicitly asked to define the role of peer mentor. In addition, mentors' descriptions of the contribution, activities, rewards and challenges of mentoring provided further insight.

The design of both the interview questions (teachers) and the peer mentor questionnaires were deliberately 'open', in order to capture all possible definitions and descriptions of the mentor role.

3.1 The role of mentors

Where the role of mentors was concerned, mentors were asked to give an account of what they thought the role of mentor entailed, and what they actually did as a mentor.

The questions about the role of mentor asked of teachers included:

- what is the role of the peer mentor?
- what characterises effective peer mentor–student interactions?

Two main themes emerge in defining the role of peer mentors and describing their contributions:

1. Providing assistance to students and teachers;
2. Encouraging and motivating students to learn by making science more interesting.

Mentors clearly saw themselves as being in the classroom to help – assisting students was the highest returned response on this question, with enthusing and motivating students and helping the teacher as the second and third most common responses (Table 3.1). Making science interesting is an important function to some mentors, also.

When asked what constituted the role of mentor teachers frequently spoke about what it *wasn't* and, more often than not, compared hosting a mentor in the classroom to having a student teacher. They were quick to point out the difference between the two and the different relationship this engendered between mentor, teacher and students:

> With a student teacher you're not only acting as a role model, you're a vital part of their development, but with a mentor they may have no real interest in education. It might just be an experience, a taste of it or a chance to put something on their CV. I don't have an expectation that a peer mentor would come in and run a class or plan a lesson or that sort of thing. If they want to, that's great. But it's not the same expectation [as with a student teacher] and you're not judging them in the same way, either.
>
> They're not coming in as another teacher.

> She didn't call attention to herself and neither did they pay all that huge amount of attention to 'oh there's someone new in class' as they would for student teachers. There was no stress.

Many teachers believed the primary function of the mentor was to be a role model, a 'non-teacherlike', 'non-nerdy' figure that would motivate students to regard science as both interesting and a possible future career option.

> For me the role model thing is most important because they're only there for a short time, anyway. To give kids a bit of a taste of what it's like to be a uni student only three, four or five years older than they are. 'She's like me, she's been to uni and she's not a real dag' – because I think with science we tend to lose the glamour side of science in year 10. A lot of our girls seem to turn off at that age and think it's nerdy or whatever.

This is discussed further in Chapter 4.

Table 3.1: Peer mentors' perceptions of their role in the classroom.

The response of peer mentors to the question: W*hat is the role of the peer mentor in the classroom? What do you think it s the most important thing you do as a peer mentor?*		Frequency of responses	Percentage of responses (n=66) %
Serve as a role model	Of a university science student	2	3.0
	Generally	3	4.5
Provide assistance in the classroom	Assist the teacher	10	15.1
	Assist the students	16	24.2
Raise awareness in students	Of University	3	4.5
	Of career options of science	4	6.0
Provide knowledge of science	Provide current information	5	7.5
	Make science interesting	7	10.6
Provide pastoral support and/or motivation to student	Get to know students	1	1.5
	Be an approachable source of assistance	4	6.0
	Enthuse and motivate students	11	16.6

The responses from both teachers and mentors about the role of mentors raise questions about who should 'fit in' with whom. One mentor wrote that:

> Although a lot of emphasis was put on process/procedures in the training, when actually in the school teachers have very little time to deal with technicalities of the program, rather it seems most important to adapt to what they need and they way they work.

But this was an unusual attitude: the majority of mentors believed that teachers should have been planning classes that took the mentor's presence into account:

> [Teachers should] be flexible and give a detailed description of where the course for students is going. Allowing for the mentor to come up with new delivery techniques.
>
> Have work time and pracs in class, not 'lectures': mentors need to be utilised when at the school.

Should a mentor try to fit in with the lesson plan a teacher has already organised, or should the teacher be planning lessons taking the mentor's involvement into account? Mentors frequently reported feeling that teachers did not design their classes to make optimal use of their presence and this sometimes had the effect of making mentors feel redundant and unappreciated. This is described in more detail in Chapter 5.

4. The benefits and rewards of peer mentoring

4.1 Benefits and rewards for mentors

Mentors were asked to describe, via written feedback, the most rewarding aspects of their mentoring experience. They are clear about the rewards they receive from the program with an overwhelming majority of responses (Table 4.1) indicating that the greatest reward of being a mentor is the pleasure gleaned from seeing students interested and enthusiastic about science, and watching students have what one respondent called an ‘‘Oh I get it now’ moment’.

Table 4.1. The most rewarding aspects of mentoring, as identified by mentors.

The response of peer mentors to the question: *What aspects of your role as peer mentor do you find most rewarding?*	Frequency of Responses	Percentage of Responses (n=39) %
Helping students	6	15.3
When students feel comfortable/interested/enthused	20	51.2
Interacting with students	9	23
Getting positive feedback/thanks from students	2	5.1
Interacting with teachers	1	2.5
Finding out how science is taught in Australia (international student mentor)	1	2.5

Mentor comments also indicated that generating student interest and understanding were the most valuable rewards:

> Getting a pair of eyes, which seemed interested in what I was doing.
>
> [T]hat look of realisation on a student’s face when they suddenly understand what is going on after I have explained it to them. Another rewarding aspect is watching the younger students ‘playing’ in the laboratory; fascinating stuff.
>
> See [sic] the look on the kid’s face when they get it. It was like a light went on. They then tended to become more enthusiastic.

An interesting point about the rewards for mentors arose from the teacher interviews. Teachers were asked what they thought the rewards of the program were for mentors and whether they had entered into discussion with their mentor(s) about the benefits of the program for them. None had, and none of those interviewed could elaborate on what they thought the benefits of the program were for mentors. Indeed, one teacher discussed at length the discomfort she experienced because she felt the mentor was virtually being taken advantage of:

> I just do continue to wonder about the benefits to the mentors. The benefits to the students, the teachers and the school are huge, but I've been quite conscious that the mentors are taking time out to travel out to a school and be there for a large chunk of their time and that's not necessarily something of huge benefit to them unless they do have an educational aspiration of some kind.

However, despite the fact that teachers could not see what mentors got out of the program, mentors themselves reported the benefits to them as substantial, and the benefits are closely tied to whether or not they feel they are achieving learning outcomes for students.

Mentors and Teaching Experience

While it is not a stated aim of the program, for many mentors *In2science* is an excellent way to test their ideas about teaching against that of a real classroom experience (Table 4.2):

For some, the *In2science* mentoring experience reinforced their pre-existing decision to become a teacher in future:

> Yes, I am sure now, well I think I would enjoy being a teacher and could do it.
>
> *In2science* has influenced my career plans as it has further confirmed that teaching is the path I would like to take.
>
> No, I've always wanted to teach. *In2science* just showed me a number of different schools that I would probably consider teaching at.

For others peer mentoring with *In2science* inspired them to consider teaching as a career, where they may not have previously:

> Yes, it has made me think about doing a Diploma of Education. (BSc double-major in Microbiology and Chemistry)
>
> Yes, after this I may consider teaching for my future career. (BSc majoring Environmental Science/Geography)
>
> I realised teaching is not the path I would like to go – without *In2science* I would be another lousy teacher – thank you!
>
> Yes! I was weighing up between honours and a dip ed but after seeing first hand what teaching entails I believe I would like to start teaching as soon as I complete my dip ed. (Bach. of Biotechnology and Cell Biology, double major Chem and Biochem)
>
> Has helped me decide that I do not want to be a high school teacher yet, that my time in the classroom can wait until I have more self-confidence and better communication skills. (BSc, double major in Botany and Zoology)

For others (n=6/28), the opposite was true: mentoring actually revised their previous consideration of teaching as a career:

> Well I definitely don't want to be a teacher! Still interested in communication but would now like to work with the general public rather than children specifically. Not that the kids weren't great, but I just feel the school/teachers let us both down in terms of maximising the program's potential. (BSc, majoring Physiological Genomics)
>
> Yes, I do not want to teach after program. Gave me exposure to education and allowed me the opportunity to work out advantages and disadvantages of teaching. (BSc, majoring in Zoology/Marine Biology)

> [I]t has given me a reality check about what the daily grind of teaching in high schools is about. So perhaps I am now less keen to do a Dip Ed and go into teaching. (BSc, majoring mathematics/BA majoring Chinese).

Table 4.2. The effect of the *In2science* experience on mentor career plans.

Peer mentor responses to the question: *Has In2science influence your study or career plans, and why?*		Frequency of responses	Percentage of Responses (n=30) %
Yes	Want to teach now	4	13.3
	Have changed my mind and don't want to teach now	6	20
	Am considering teaching	5	16.6
No	Was always planning to teach	6	20
	Wasn't considering teaching	7	23.3
Ambiguous		2	6.6

Skill Development

Mentors' answers to questions about what skills they believe *In2science* had helped them develop reveal that it is the ability to explain science to others that rates most highly, both on a Likert scale and an open question format. Eighty-seven percent of mentors reported they had 'considerably' improved their ability to explain science, with 35% of responses to the open question 'What is the most valuable skill or skills you believe you have developed?' listing this ability.

But it is clear that developing confidence generally is a common benefit for mentors – they are having to learn to negotiate a different environment to the academic one they are accustomed to at university (one mentor, for example, commented that it was the role of the teacher to 'be pushing you constantly to step out of your comfort zone.')

Other valuable skills mentors reported to have developed during the experience included communication skills and the ability to relate to students. Although only a small number listed their CV as a reason why they decided to become involved in the program, the development of skills valuable to future employers (for example, problem solving and public speaking) is an added benefit.

If anything could be said to be disappointing about the responses from mentors it is, perhaps, that only 19% rated 'team work' as a skill they had developed 'considerably', given that they had been working alongside teachers in the classroom environment (although 74% did say they had developed the skill 'a little'). Only one mentor nominated it as the most important skill or skills they had developed. However, due to reported issues with time and expectations (see Chapter 5), it may be unrealistic to expect a high response rate to this particular question.

Figure 4.1. Mentors' perceptions of skills development from involvement with *In2science*.

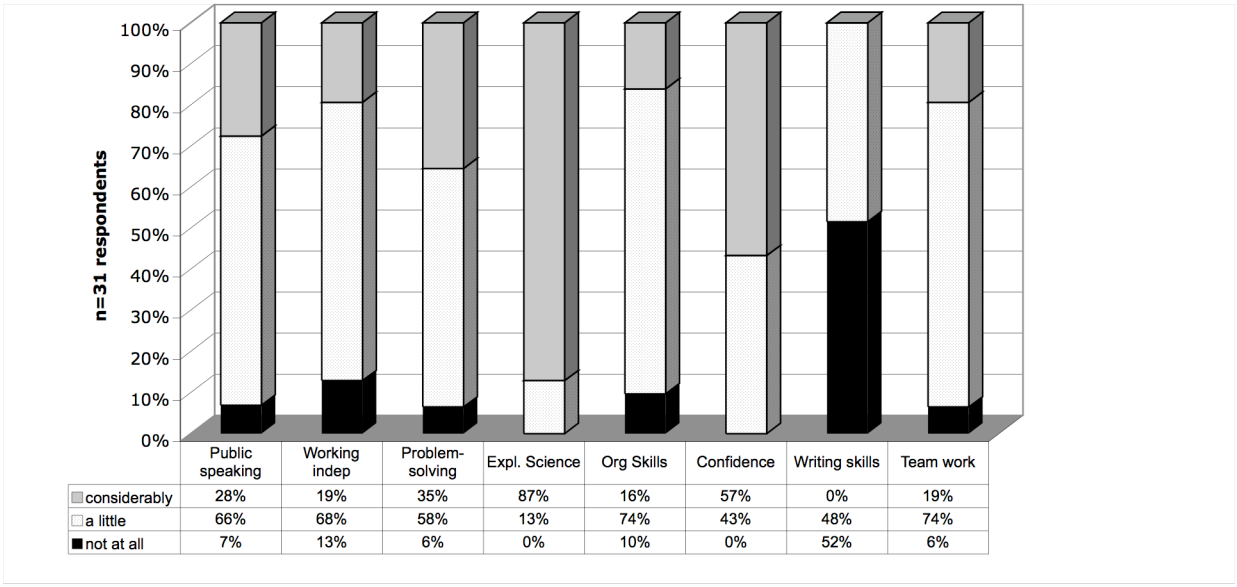

Table 4.3. The most valuable skills developed as a result of involvement with *In2science*, as identified by mentors.

Peer mentor responses to the question: *What is the most valuable skill or skills that you believe you have developed as a result of your involvement with In2science?*	Frequency of Responses	Percentage of responses (n=45) %
communication (general)	9	20
listening skills	3	6.6
explaining science/maths	16	35.5
relating to students	8	17.7
confidence	4	8.8
networking skills	1	2.2
teamwork with teacher	1	2.2
insight into teaching	2	4.4
problem solving/quick thinking	1	2.2

4.2 Benefits and rewards for schools

Because of the barriers experienced in obtaining feedback from students for this report, and the fact that only six teachers agreed to be interviewed, it is difficult to draw definitive conclusions about the benefits of *In2science* for schools. However, mentors certainly believe they were having an influence on students and teachers also reported positive benefits of having a peer mentor in the classroom. These benefits came mostly from the mentor's status as a role model for students and the fact that the mentor was a fellow learner:

> [The mentor was] an energetic, dynamic person; she worked outside uni, she'd gone back to uni, she was a mum and I thought she was just a really excellent role model for the kids in terms of being young and trendy and energetic and lively and friendly and a scientist. [teacher]
>
> The fact that she was young and not obviously a teacher or a student teacher helped a lot I think because they didn't feel again that they were being targeted. So she was young, she's around their age so that was quite good. [teacher]
>
> Being able to interact with students without having stereotype of 'teacher'. [mentor]
>
> [Mentors] are much more on an equal footing, they're learners together. It's OK for the mentor to say they don't know anything about certain topics. [teacher]
>
> Peer mentors are closer to being in that learning situation. [teacher]
>
> Engaging in intelligent conversations with the students where we both learn something new! [mentor]
>
> Students are able to communicate to me more easily and feel more comfortable asking the sorts of questions [where] maybe a teacher would make them feel 'stupid'. [mentor]

Thus, teachers and mentors both reported that having someone else in the classroom who is neither a teacher nor student teacher can have the effect of changing student attitudes to science.

Teachers also acknowledged that it was useful to have the mentor in the classroom as another 'pair of hands' and/or someone other than the teacher to explain things:

> It gave [the students] someone different in the classroom to talk about concepts and they enjoy that; they enjoy just speaking to someone different who was at uni and doing the things they wanted to do.
>
> It was very good for the kids to have experience of other people coming into the classroom.
>
> There were four or five students who were less able in the maths class and a lot of time had to be spent with them usually, so having someone in there who could focus on those students plus assist if there were others as well – that was really good.
>
> One day the mentor's car broke down and she couldn't make it and [the students] were just so disappointed, which to me was wonderful – they were really looking forward to seeing her.

4.3 *In2science*: A model case

One of the teachers interviewed as part of this study had found her experience of *In2science* particularly fulfilling. From her comments it is clear that peer mentoring is particularly effective under the following conditions:

- Teacher and mentor have adequate time prior to class to communicate how things are going and what topics will be covered in the next class;
- That the mentor is flexible and adaptable: sometimes being an assistant and sometimes taking charge in the classroom;
- That the mentor be a figure differentiated from the teacher (youth is an advantage in this sense);
- That in order to be really effective, a mentor's visits need to be frequent and sustained over an adequate period of time.

Here are some excerpts of what she reported during her interview:

> [Having the mentor in the classroom] gave the kids the concept that maths wasn't just about school, wasn't just about sitting around doing exercises.

When asked if there was any discernable educational benefit from the mentor's involvement she answered that:

> In some cases there was huge improvement. I had a group of girls who seemed to feel that if they had a messy workbook or if they were getting questions wrong that would be the absolute end of the earth. They were absolutely terrified of this prospect. Having somebody who sat there and talked to them in a very calming, gentle fashion and scribbled things all over pieces of paper to help them work things out and showed them that it was OK to make mistakes and to have a go we saw a great improvement with that particular group of girls. We really saw them gaining confidence just in simple things like the number of questions they were prepared to attempt really improved.

According to this teacher the mentor was able to be a positive role model for students who are often getting negative images of maths from parents and other adults she showed them that maths

> isn't a 'teachery', nerdy thing. They see her as a cool young uni student–a huge bonus.

In this case, all four of the *In2science* aims were achieved:

1. To generate enthusiasm for Science
2. To place university students in schools to act as positive role models to secondary school science students, inspiring them to achieve their potential.
3. Through the role models, promote the value and rewards of Science as a positive career choice.
4. To foster links between schools and universities.

5. The Issues for mentors, teachers and *In2science*

This section examines what mentors and teachers reported as the difficulties they experienced with peer mentoring. It also discusses the elements of mentoring and the program that raised problems for both mentors and teachers. These particularly concern:

- frequent differences in expectations between teachers and mentors;
- time constraints;
- poor communication and/or a lack of opportunities for communication; and
- mentor perceptions of teachers' lack of understanding of the purpose of the *In2science* program itself.

5.1 The challenges for mentors

Table 5.1: The challenges of being a peer mentor, as identified by mentors.

Responses of peer mentors to the question: *What aspects of your role as peer mentor do you find most challenging?*		Frequency of Responses	Percentage of responses (n=45) %
Engaging with students	Engaging disinterested students	7	15.5
	Identifying interested students	1	2.2
	Encouraging students to ask questions	3	6.6
	Learning names	2	4.4
	When students don't understand why you're there	1	2.2
Knowledge	Answering difficult questions	2	4.4
Time limitations	Finding time to interact with students	3	6.6
	Building rapport in once-weekly or fortnightly visits	4	8.8
Pedagogical/classroom issues	Classroom management	3	6.6
	Creating a lesson plan	1	2.2
	Finding the right words to explain concepts	6	13.3

While responses from mentors about the rewards of the program are heavily weighted one way (see Table 4.1, page 10), those regarding the challenges are far more diverse, making it difficult to get a clear sense that there are two or three challenges particularly common to mentors. On the whole it would seem that the challenges are largely circumstantial, depending on the nature of the school/classroom experience and the personality and background of both mentor and teacher.

Engaging disinterested students (n=7/35, 20%) rates as the most common response to the question of the greatest challenge of mentoring:

> Often it was the high achievers who felt I had nothing to offer them. This was incredibly frustrating because I felt unwanted and unappreciated.

> Trying to help students who hate school and refuse to do the work

with 'finding the right words/explaining' coming a close second (n=6/35, 17%).

> Explaining the simple things that to me are obvious . . . when the kids didn't understand it was hard to explain in different words.
>
> Finding correct level of pitch in regards to information.

But as well as revealing what the mentors found challenging about the program, the responses to this question also provide insight into the fact that mentors took seriously the need to engage students and attain visible learning outcomes as one of the key responsibilities of their role.

> None is very challenging except trying to really explain things and be on the kids level to make them feel more comfortable and less ashamed if they can't do something.

5.2 Differences in expectations

When examined together, the teacher interviews and mentor questionnaires reveal a frequent and distinct lack of convergence where the expectations of both mentor and teacher are concerned. Mentors were asked what they thought the teacher *should* be doing, rather than what their *actual* experience was.

Thus, the question– 'School teachers hosting a peer mentor should…' (Table 5.2) – does not reveal what did or did not happen during the mentor experience, but rather what expectations mentors have of the teacher's role. Table 5.2 indicates that 'including and involving mentors' was returned as the most common response (n=15/40, 38%) with 'providing lesson information' also rating as important to mentors.

However, some mentors also saw this as an opportunity to evaluate the teachers they worked with in the program, commenting not only on what they thought was important that teachers do, but whether not their expectations were met. These included both positive and negative comments. For example:

> Be a bit more understanding that it's difficult to come in and be expected to help out. They should give a plan at least a week beforehand so you're more prepared!
>
> Plan their lessons so I don't stand around half the time while they explain things to the class! The teachers often forgot I was coming and had no plan for me. They also rarely contacted me outside of lessons to let me know what the class would be doing next.
>
> Be more willing to include the mentor during that class, i.e. Make sure they are doing a prac, answering questions, etc. Not watching a video or listening to the teacher. MAKE IT MORE HANDS ON.
>
> Work together as a team with the peer mentor (the teacher that hosted me [was] great and showed this.)
>
> Conduct lessons where there is plenty of opportunity for the peer mentor to engage with students. This was evident in both placements.
>
> Be proactive about their involvement. Use mentor more.
>
> Make it possible for the mentor to be prepared. I only found out what the kids were studying when I got there. It works for Year 7 but not older.

These comments reveal a common–but certainly not universal–mismatch of expectations between individual mentors and teachers.

Table 5.2: Mentor perceptions of what teachers hosting a peer mentor should do.

Responses of peer mentors to the question: *School teachers hosting a peer mentor should…*	Frequency of Responses	Percentage of responses (n=40) %
provide lesson information	13	32.5
support the mentor in getting to know the class	2	5
encourage mentor initiative	2	5
suggest how the mentor can contribute	4	10
include and involve mentors	15	37.5
make clear/discuss their expectations	4	10

What becomes clear from both mentor and teacher responses is that there may be a tendency for mentors and teachers to have different perceptions of what the role of mentor and, indeed, the *In2science* Program is.

In interviews, for example, it is clear that teachers highly value mentors who show initiative:

> In the short time I had her. . . she was just wonderful. She showed a lot of initiative and she related really well to the students… She showed initiative–she suggested, you know, 'would the girls be interested in what I've been doing for the last year?' and so on, and the kids loved her. They just loved her coming into the class.

And the converse:

> [The mentor] I felt didn't get very much out of it because she just sat with a group of students all the time and became chummy chummy friends with them but didn't really have any initiative, didn't really get involved.

While it is clear that the teachers interviewed highly value initiative from mentors, mentors themselves may not see showing initiative as a particularly important part of their role, with only two responses of forty indicating that encouraging mentors to show initiative was part of the role of the teacher. One mentor commented that because of teachers' lack of time

> it seems most important to adapt to what they need and the way they work.

There was also a common perception among mentors that the teachers they worked with did not properly understand the purpose of the *In2science* program. One mentor commented that teachers should:

> Have an understanding of the aims of the *In2science* program, included what is expected of both the student and the teacher.

And that the role of the coordinator is to:

> Inform all participating teachers (not just the *In2science* coordinator at the school) as to the aims of the program and what is expected.

For their part, teachers also gestured towards this difference in expectations between mentors and teachers. One teacher went into the issue at length:

> I don't know if it was the students or the program–they just seemed to come and observe and they weren't interactive and didn't bring many resources or anything with them into the classroom… I was hoping for them to bring ideas and activities and resources from uni that could extend on what we have here. But even when I said [send] me an email and we can talk about what we can do or what we can bring I didn't really get emails from them… It was like they were just there as helpers rather than actually proactively contributing something.

Although this kind of experience appears to have been largely determined by the particular personality of the mentor involved – the comments from this teacher may have been quite different had another mentor been placed in her class – it is also a product of the lack of communication between mentor and teacher and, perhaps, the lack of an initial targeted discussion about the expectations of each.

While it is clear from the interviews collected in this study that teachers would like mentors to show initiative in engaging with students, several mentors commented that the *teacher's* lack of planning and communication sometimes affected their ability to properly fulfil their mentoring role:

> Have work-time and pracs in class, not 'lectures'. Mentors need to be utilised when at the school.

> Try and help the mentor to interact with the students by either doing pracs in the class or group work where the peer mentor can help particular groups.

> Try to use the mentor's skills in classes – doing group work and practicals.

> Be aware of the best way to use the mentors. For example, it is best not to schedule video classes on mentor day; or mentors can be extremely helpful with practicals or experiments.

Others were looking for specific guidance from the teacher on their classroom behaviour:

> [Teachers should] explain what's happening in each class and the role they expect you to play.

> To make their expectations clear to the mentor.

> Let the mentor know what the students will be doing, give them guidance about how to act in the classroom.

> Allow the mentors to act at their own initiative but at the same time give suggestions to how the mentor can help fitting in with the subject's curriculum.

Because of the nature of the program and the serendipitous matching of school, mentor and teacher, the likelihood of mismatched expectations is high.

One way this might be overcome is by having both teacher and mentor fill out a checklist as to what they believe the role of the mentor and/or teacher is *before* the commencement of the program. The forms could then be exchanged between teacher and mentor to seed discussion about how their partnership will work during classes. While the optimal mode would be in a face-to-face meeting, this could also be done to some effect by email (see Executive Summary for a suggested model for a targeted Communication Pack).

The role of the *In2science* Coordinator was another area mentors were asked about. Most saw the role of the Coordinator as monitoring the experience of mentors and resolving problems with the placements, should they arise.

Time

The teachers surveyed repeatedly expressed that one of the primary barriers to making the most of the opportunity of having an *In2science* mentor in the classroom was a lack of time. Time was not only an issue before and after individual classes, but at the beginning and the end of the program. When asked what they thought the mentor got out of the program teachers were frequently unable to answer the question because they simply hadn't had the opportunity to broach the question with the mentor when the placement finished.

> No time! I would see her for five minutes afterwards because we were rushing off to the next class. [teacher]
>
> Teachers are stretched to the limit, time-wise.
>
> I did feel guilty a few times that I didn't spend enough time with [the mentors].

One teacher commented that it would have been much better to have had:

> more time, more consultation and just to have a chat about what they hope to get out of it.

Another, who was unequivocal about the benefits of peer mentoring was asked if she thought there were any weaknesses in the program:

> The only weakness is the mentor's usefulness can be limited by the amount of communication the teacher has and the contact the kids have. So it comes down to time, which is such a critical thing.

Time was also a factor where the mentor's presence in the classroom was concerned. Two teachers who were interviewed together commented on how pleased they were with their mentor on the whole ('she was just wonderful'); however, the teacher in whose class she was present on a weekly basis was unequivocal in her praise for both the mentor and the benefits of her presence, while the other who, on average, only had the mentor present in class once a fortnight, was less enthusiastic:

> For me the time was much more limited. For me that was a big issue, trying to get time with the person. We had to fit in their timetable and they have to try and fit in with ours.

From the point of view of some mentors even a weekly visit can make it difficult to 'connect' with students properly:

> What I find most challenging is getting to know them initially and then maintaining that relationship in spite of seeing them only once a week.
>
> Only coming into the class once each week and trying to figure out what they are doing. Sometimes it can take 10 or 15 minutes to assess what they are doing.
>
> The most challenging aspect is trying to remember the student's names! I have four classes and two of the classes I only see once per fortnight. It is nearly impossible to remember their names!

Communication

Hand-in-hand with the challenge of finding adequate time come the difficulties of maintaining effective teacher-mentor communication. One teacher who was extremely positive about both her mentor and the program as a whole commented that the only weakness of *In2science* as she saw it was that:

> The mentor's usefulness can be limited by the amount of communication the teacher has and the contact the kids have. So it comes down to time which is a critical thing.

This teacher went on to comment that the most valuable contribution made by the mentor was when they did get a chance to sit down together to discuss the following weeks class plan and she 'could go away and think about things.' This is reinforced by comments from some mentors:

> I find it really difficult to come in and be expected to know exactly where they are up to in terms of the chapter/topic and be expected to answer their questions on the spot.
>
> Talking and asking extra questions to students [is the most challenging aspect] because the schedule is very tight and I find it hard to get time to talk to them.
>
> Being put on the spot –sometimes by the teacher and sometimes by the students [is the most challenging aspect]

(Mis)understanding the program

While there may have been some problems with fostering effective mentor-teacher communication because of time constraints, some mentors also felt that some of the teachers did not properly understand what the function of a mentor is, or did not have a good understanding of what the *In2science* program does. This was a frequent source of frustration for mentors, who sometimes believed they were undervalued and underused:

> Teachers are often unaware of what the role of the mentor is.
>
> One unfortunate aspect of the program is I don't feel that the class teachers that I was allocated with have sufficient understanding of the mentor's purpose and their full potential.
>
> More info regarding *In2science* should be provided to the actual class teachers so they can have class times that use the mentors. Also, subjects that run for the whole semester so that relationships can be built up over a reasonable length of time.
>
> I found the program quite enjoyable but this may have been because I had a teacher who was enthusiastic about his subject and used [it] to benefit the students and I was given the impression that he wanted me to be there.
>
> The schools need more education about the program – its goals and the role of mentors in the classroom. It's all fine to explain these things to the school's science coordinator but if the actual teachers involved don't get the message, it makes things very difficult.

One teacher admitted that she had 'minimal' information about the program when she agreed to be involved, commenting that teachers' awareness and understanding of the program often depends on 'who is running the science department'. She went on to describe how she was approached about the program:

> The coordinator just basically said: 'we've got this *In2science* person coming in. Are you happy to have them–yes or no?'

As well as problem-solving and monitoring mentor experience, mentors also believed the role of the *In2science* Coordinator is to increase awareness among teachers of what the function of both the program and the mentors themselves were. Several commented that

there needed to be more direct communication between *In2science* and the teachers who were hosting mentors in the classroom:

> Inform all participating teachers (not just the *In2science* Coordinator at the school) as to the aims of the program and what is expected.
>
> More info regarding *In2science* should be provided to the actual class teachers so they can have class times that use the mentors.
>
> Make sure all parties, i.e. teachers and mentors, are informed on the purpose of the mentor visiting the school.
>
> Communicate with the class teachers and school on the purpose of the program.
>
> Coordinate aspects at a higher level (i.e. with principals).

One teacher also had feedback on how the efficiency of the program might be improved by matching mentors with schools/teachers and suggested that organisers have:

> A look at the areas where we as a school feel that the *In2science* mentor could do the most good. If we could say to the organisers: 'we would really like a maths-oriented person or a science-oriented person to come and work in a particular environment' and we could set that up with a bit of awareness about the [mentor] we were getting coming in then that would help us with timetabling difficulties that we experienced. Or if that's not possible if we could at least have some knowledge of the background of the person before they arrived, that would be a big help.

6. Conclusions

In2science is an effective peer-mentoring program, the outcomes of which are particularly beneficial for mentors themselves. However, in order to achieve more of its stated aims, there needs to be a review of how *In2science* is promoted among teachers and schools in order for them to make it a higher priority that is deserving of their time and attention.

There is little doubt that the *potential* benefits of the *In2science* program for both teachers and mentors are sizeable. For teachers there is the benefit of having the assistance of an extra person in the classroom, the presence of a role model for their students and a potential increase in their students' interest in science. For mentors the experience of seeing how a classroom works and the sheer pleasure of helping students learn was reason enough for most to participate in the program. This report is unable to draw any definitive conclusions regarding the benefits to students, given the fact that an extensive survey of students was not possible; however, one case examined in this study indicates there is distinct potential for a marked change in learning outcomes for some students (see page 14, *In2science*: A model case).

The enthusiasm of mentors for the *In2science* Program is evident. As mentioned earlier, the primary reason mentors report for getting involved in the program is one of altruism: the pleasure of feeling as though they are making a difference to students' understanding of science is the primary reason mentors say they become involved in the program. Even those for whom it is compulsory are extremely willing to do it – none of the mentors in this group expressed any reluctance whatsoever to undertake the program.

While mentors report altruistic reasons for becoming involved, the benefits for them in terms of both skill development and helping them make decisions about their careers are marked. They particularly believed that their ability to explain science to others increased considerably and, for a substantial number, the mentor experience was crucial in helping them make decisions about their career direction, whether it was to reinforce or revise their existing ideas about a teaching career. While it is not a stated aim of *In2science*, the program has strong potential in helping university students decide whether they are interested in a career in teaching and, perhaps more importantly, whether they are suited to it.

6.1 Factors that determine the success of mentor placement

The factors that have the most influence on the success of a mentor-teacher relationship and, ultimately, the outcomes of the mentor's presence at the school are time and the level of understanding of both teachers and mentors about the program and its aims. These also have a major effect on whether or not the teacher and mentor have different expectations of their roles, which seems to have a material effect on whether a placement is successful or not.

Time

All six teachers interviewed for this study, regardless of their experiences of the program, commented that time was a significant barrier to them getting the most out of their involvement with *In2science*. Whether it was time prior to class to discuss the lesson plan or time at the end of the program to sit down with their mentor and discuss the benefits and outcomes, teachers believed their lack of time had a major effect on the potential of *In2science* for them and their students. Mentors and teachers also both reported that it

was necessary for the mentor to be present in the classroom on a regular basis over a sustained period of time for there to be genuine benefits for all stakeholders.

One teacher, whose experience of *In2science* was extremely positive, suggested that a release from teaching –even just for one period at the beginning and end of the program –would have allowed her to spend some time with her mentor to discuss such things as what the mentor hoped to get out of the program. A discussion such as this at the beginning of each placement may have some effect on the second element affecting the success of peer mentoring: expectations.

Information and expectation

There is little doubt that the personalities and working styles of both teachers and mentors play a major role in whether or not a mentoring placement is successful. These are, of course, fixed variables. However, it is also the case that the level of communication between teacher and mentor may also materially affect the way the relationship works.

There was a strong emphasis in mentor feedback on the need to feel included and useful in the classroom. The fact that mentors overwhelmingly identified 'helping students' as the primary role of the mentor is clearly tied to this need. The demographic of this particular cohort of mentors perhaps renders this even more important because so many of them (n= 19/31) are undertaking the program to get a 'taste' of teaching, in order to assist them with future career decisions.

Another element that mentors report as significantly affecting their experience in the classroom is the level of teacher understanding of what the program is about. Many mentors were frustrated because they believed that teachers simply didn't have a clear picture of what the role of the mentor was and what the *In2science* program was trying to achieve. Some commented that facilitating better communication between *In2science* and the classroom teachers (not just the Link teacher at the school) would make a difference to the effectiveness of the program.

Also apparent from both mentor and teacher feedback is that teachers and mentors often have quite different ideas about what the behaviour of a mentor in the classroom should entail. Indeed, there are vast differences *between* mentors about what the roles of mentor and teacher are. Should the mentor be proactive or should they wait for the teacher to provide direction and guidance? Because the answer to these questions will differ from teacher to mentor and from mentor to mentor, it is important that discussion is facilitated between the individual mentor and classroom teacher as to what each thinks their role is and how they see their partnership working. As suggested earlier, a checklist that each completes and then is exchanged (even by email) may be one way to facilitate these kinds of discussions and, potentially, overcome issues of misunderstanding.

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