

# **Broadening the appeal of a mentoring program to first-year students in a science research culture**

Misha Donohoe and Charlotte Taylor. Institute for Innovation in Science and Mathematics Education and Faculty of Science, University of Sydney.

## **Abstract**

*This session presents a case study of the Science Mentoring and Leadership Program (SMLP) in the Faculty of Science at the University of Sydney and raises the questions: 'Which first-year students are underrepresented in this program and why?' The SMLP is a tiered mentoring program intended to ease the transition of first-year students into a research-intensive environment by linking them with senior students, postgraduate tutors and demonstrators, and academics. In 2009 we looked at first-year student experience data and marks of those who did and did not attend the SMLP. Despite positive outcomes, we want to engage with the non-participants, who may include those at risk of failing courses, are less motivated by their degree program, or who may be reluctant to join a mentoring program. By locating non-participants in the wider university community this session will explore ways to widen the participation of underrepresented students and cater to their needs.*

## **Introduction and context for the program**

The transition to university can be challenging for many first-year students as they move to a new learning environment which is usually much larger and more diverse than that experienced in school (McInnis et al 1995). Studies of the effects of transition have reported issues with new students withdrawing from courses, problems with loneliness and isolation, and inability to cope with an increased workload (Pitkethly and Prosser 2001). Krause et al. (2005) concluded, in their 10 year review of first year perceptions of transition that, while many of these problems still existed, there was increased satisfaction with the initial experience of university, possibly because of an increase in efforts by universities to engage with students in transition.

It has therefore been acknowledged that specific programs need to be designed to help students during this period, which will acquaint students with the university environment, provide contact with other students and with teachers, have a clearly defined structure and be student-centred (Tinto 1995). In addition attention needs to be paid to the link between such programs and the students' courses of study, such that the benefits of the programs are also evident in enhanced learning outcomes (Tinto & Goodsell 1993). Peat et al. (2001) have addressed some of these issues in their design of a transition program, which focuses on developing peer learning groups which integrate into the learning experiences in their core courses. Evaluation of this initiative showed that the peer groups can be very powerful in preventing students from dropping out, and help in developing successful social groups and study habits which may persist throughout first year. Similar transition and mentoring programs have also found that students were more likely to remain in their course and

to be successful in academic studies (Rodger and Tremblay 2003, Glaser and Hall 2004).

We are therefore aware of the problems for students in joining a large diverse faculty such as the sciences, where our first year courses are typically large, with between 1000-2000 students in the cohort (Peat et al. 2005). We also know that we need to take into account the possible mismatch between the university's expectations of incoming students and the students' perceptions of their experiences at university (James 2002). In addition, students may be enrolled in a generalist science degree with possibly no clear career goal to motivate them in their initial studies, and we have an increasing proportion of first-year students studying in combined degrees where they are enrolled in two different faculties. A sense of belonging can therefore be particularly difficult to foster in such situations (Krause et al 2005).

### **Integrating first-year students into a science research culture**

There is an added component to transition in first year when students are entering a research-intensive university. Here there is a culture of involvement in cutting edge research amongst the academic staff and the postgraduate students, many of the latter also acting as demonstrators and tutors for first year classes. In order to gain the most from this environment it is essential that all undergraduate students have a sense of belonging to this culture. For many of our students this is achieved through special study programs that give students the opportunity to carry out individual or group research projects. In this way these students join research and laboratory programs where they interact with peers, postgraduate students and research academics, and become part of the team. We feel that it is essential that all students have experience of research to enhance their overall scientific literacy, regardless of their ultimate career outcome on graduating from university (Hanauer et al. 2006). However, these opportunities may not be available to all science students and some students may not be highly motivated to be involved in research. By meeting and interacting with groups of scientists at various levels of their careers, as part of a mentoring initiative, this integration process can begin at an earlier stage.

### **Recruiting mentors and first-year students**

Senior students, tutors, demonstrators and research academics are invited to participate in the SMLP in September of the preceding year (2008 for 2009). Senior students who volunteer must complete an online training module over their summer vacation before attending a half-day mentor-training workshop with the other mentors. Here, all mentors are introduced to the aims of the program and receive guidelines of their roles and responsibilities as a mentor. To facilitate this, the results of the online training module are discussed and role-plays are performed to exercise mentoring and coaching skills. Mentors then form smaller groups in order to plan their face-to-face meetings with first-year students. This workshop is held a fortnight before first-year students arrive on campus.

Commencing first-year students are informed of the program via the internet, email, the Faculty of Science Transition Workshop (held the weekend before orientation week), posters and word-of-mouth. Interested first-year students then register online for a mentoring group that appeals to their interests and fits their timetable. Two face-to-face meetings are held in semester one in groups comprising first-year students,

senior students, tutors and demonstrators and (in some cases) academics. In 2009, 75 mentors from the Faculty of Science mentored approximately 130 first-year science students. Based on feedback from the student mentors, the program was altered to give them more control and flexibility over the program. In 2010 senior students will maintain contact with their group of first-year students throughout semester one. It is expected that the further involvement of student mentors will increase the appeal of the mentoring program to a wider group of first-year students.

### Evaluation and program outcomes

Following the mentoring program in 2009, all first-year students were invited to participate in a study on their experience of first year at The University of Sydney. 72 first-year students completed this survey and gave permission for their student data and marks to be used in the study. We are currently tracking students in terms of academic progression relative to their participating in the SMLP. Of these, 40 first-year students did not volunteer for the SMLP (however a number attended the Science Student Transition workshop, which precedes the mentoring program). This data presented us with an interesting insight into:

- Why the mentoring program did not appeal to some students
- Whether these students might have benefited from such a program.

While the SMLP is not intended as a study group, feedback from first-year students who did attend mentoring meetings found them ‘motivating’ and ‘reassuring’. The same words were also present in the results of the Science Student Experience Survey. First-year students who attended the SMLP listed various outcomes, including an increased sense of belonging, feeling reassured and an increase in motivation (fig.1). While students commonly reported that they volunteered for the program in order to find out information, there was agreement among first-year students that they were able to explore ideas with their mentors (fig.2). This may not seem an obvious benefit, but opportunities for first-year students to engage directly with senior students and staff about research happening in the Faculty is rare.

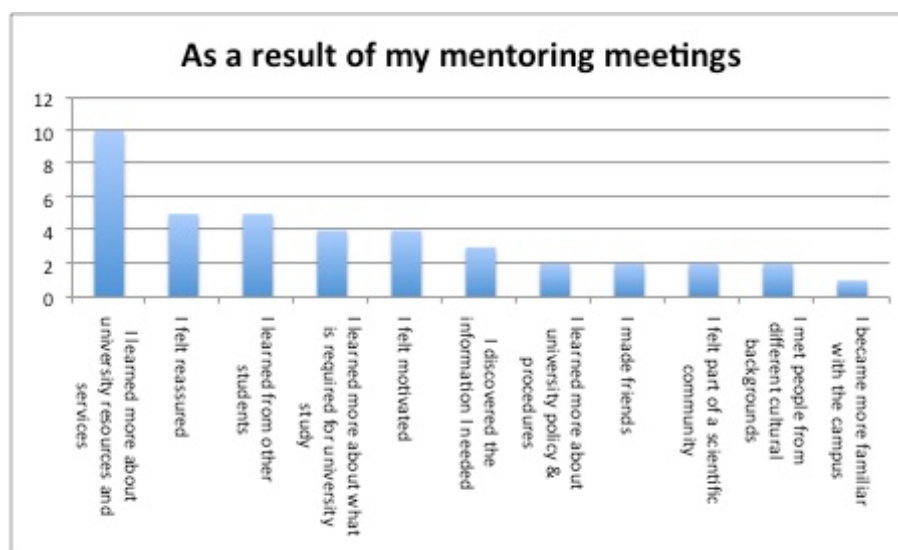
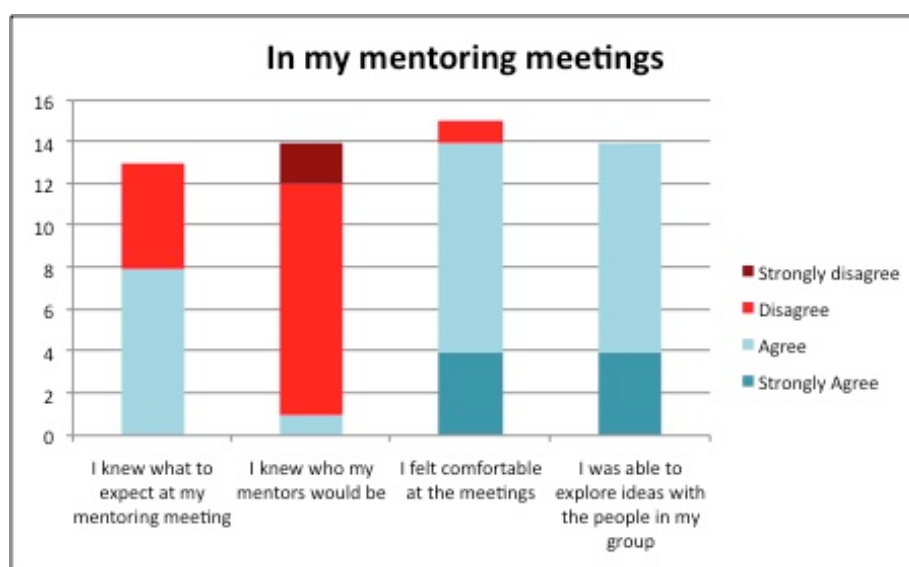


Figure 1: question 28, science student experience survey 2009

First-year students who did not attend the SMLP gave two main reasons: ‘I didn’t feel I needed to be mentored’ and ‘It didn’t interest me’. While these comments are valid, first-year students who opted not to attend the mentoring program also commented on feelings of isolation, difficulty acclimatising to university life, thoughts about dropping out of university and had lower marks on average than those who volunteered for the program. Whether this difference is caused in part by students’ participation in the mentoring program, or merely a correlation between the self-selecting cohort of first-year students volunteering for the mentoring program requires further investigation. In the mean time, care must be taken to ensure that the mentoring program appeals to the broadest number of first-year students who could potentially benefit from it.



**Figure 2: question 27, science student experience survey 2009**

### Questions for the Audience

Key issue: Voluntary mentoring programs may inadvertently encourage a strong self-selecting bias towards highly motivated first-year students. In promoting the aims of a mentoring program, the interests and needs of all first-year students need to be taken carefully into consideration so that under-represented groups do not become alienated from participating in the programs.

- How can we increase the appeal of mentoring programs to a wider cohort of first-year students? What role can student mentors play?
- How would this impact on the aims or the nature of our mentoring programs?
- What is the best (mutually beneficial) way for a widening cohort of first-year students to interact with research academics? When?

### Session Outline

1. Overview of the Science Mentoring and Leadership Program: mentoring as a means to overcome the impersonal nature of generalist faculties
2. Draw comparisons between mentoring programs in other large Faculties across the University of Sydney and with members of the audience:  
Q: who here is involved in mentoring?

- Discuss aims with respect to voluntary participation of first-year students
3. Briefly discuss results from *First year Science Student Experience Survey (2009)*: Using quantitative data, emphasis will be placed on locating these first year students within the university community:
    - i. Are students supported elsewhere?
    - ii. In what ways can other support networks compliment mentoring?
  4. Audience discussion:
    - i. Which students are under-represented in various mentoring programs?
    - ii. Should students be targeted for mentoring?
    - iii. How can we appeal to students who would benefit from mentoring?
  5. Brainstorm:
    - i. The role of senior student mentors in engaging first-year students.

## References

- Glaser, N. & Hall, R. (2004) *Students Supporting Students: The effects of peer mentoring on transition, belonging and retention amongst first year University Students*. University of New South Wales.
- Hanauer, D.I., Jacobs-Sera, D., Pedulla, M.L., Cresawn, S.G., Hendrix, R.W., & Hatfull, G.F. (2006). Teaching scientific enquiry *Science* 314, 1880
- James, R. (2002). Students' changing expectations of higher education and the consequences of mismatches with reality. In P. Coaldrake (Ed.), *Responding to Student Expectations*. Paris: OECD.
- Krauss, K-L., Hartley, R., James, R., & McInnis, C. (2005). *The first year experience in Australian universities: findings from a decade of national studies*. Canberra, Department of Education, Science and Training
- McInnis, C., & James, R. with McNaught, C. (1995). *First year on campus: Diversity in the initial experiences of Australian undergraduates*. Canberra: AGPS.
- Peat, M., Dalziel, J. & Grant, A.M.(2001). Enhancing the First Year Student Experience by facilitating the development of peer networks through a one-day workshop. *Higher Education Research & Development*, 20 (2) 199-215
- Peat, M., Taylor, C.E. & Franklin, S, (2005). Supporting learning in large undergraduate cohorts through IT based feedback In: McLoughlin C and Taji A Eds. *Teaching in the Sciences: Learner-centred approaches*. 157-177 Haworth Press. NY USA
- Pitkethly, A. & Prosser, M. (2001) The First Year Experience Project: a model for university-wide change. *Higher Education Research & Development*, 20(2) 185-198
- Rodger, S. & Tremblay, P. F. (2003). The effects of a peer mentoring program on academic success among first year university students. *Canadian Journal of Higher Education* 33(3) 1-17
- Tinto, V. (1996) Reconstructing the first year of college. *Planning for Higher Education*, 25(1) 1-6
- Tinto, V. & Goodsell, A. (1993). *A longitudinal study of Freshman Interest Groups at the University of Washington*. University Park PA. Pennsylvania State University, The National Centre on Postsecondary Teaching, Learning and Assessment.