

EXECUTIVE SUMMARY

Large-scale studies of 15-year-old school students show associations between students' attitudes toward science learning and their levels of achievement (Ainley, Kos, & Nicholas, 2008). One model for improving students' attitudes towards science and mathematics learning has been the provision of peer mentoring. The In2science program uses a peer mentoring approach to engage secondary school students in science and mathematics study. Working with the classroom teacher, university students serve as mentors and help students with their learning and build relationships in a small group or a whole class. Mentors talk to students about studying science (or another STEM area) at university and how science is used in everyday life and careers. In2science mentors act as role models to show school students what a future in science might look like.

The Australian Council for Educational Research (ACER) was contracted to evaluate the In2science program during Semester 2, 2016. The evaluation used a mixed methods approach to focus on student outcomes as a result of the program.

Key findings

- *In2science provides a valuable resource for science and mathematics teachers, who make use of the mentor in a wide variety of ways to suit their class needs.*
- *Students are more self-confident in their learning in science and mathematics after participating in In2science.*
- *Students have a greater understanding of the importance of science and mathematics in daily life after participating in In2science.*
- *Students have a better understanding of how many different occupations use science and mathematics after participating in In2science.*
- *Students' off-task behaviours reduced when the mentor was in the classroom, and continued to be reduced after the completion of the mentor's placement in the classroom.*

The In2science program operates in a range of diverse ways across different schools and classrooms, subject to the discretion of the individual classroom teacher. This allows each school and teacher participating in the program to benefit from the activities of the mentor, based on each teacher's professional judgement of how best to use the resource provided by the mentor. The program operates in Government schools, so it is important for schools and teachers to make use of any and all available additional assistance.

The analysis of the student surveys used in the evaluation In2science identified the following benefits:

- After the program, students reported that they were more confident in their ability to learn about science and mathematics.
- After the program, students reported that they had a better understanding of the importance of science and mathematics in daily life and in the world around them.
- After the program, students reported that they could use what they learned in science and mathematics classes in other classes at school.
- After the program, students reported that they were more determined to try to solve science and mathematics problems on their own.
- After the program, improvements in attitudes towards science and mathematics were greater for students who worked directly with a mentor compared to students who did not work with a mentor directly. However, students who did not work with a mentor directly also showed improved attitudes towards science and mathematics after having the mentor in the classroom.
- While the mentor was in the classroom, student behaviour improved. Off-task behaviour remained lower after the mentor's placement had finished.

Students also indicated that they are more confident in discussing science and mathematics with family and friends, but at a lower level than the other post-program effects.

This evaluation was not able to establish longer-term effects of In2science.

While this evaluation did not investigate mentors' experiences of the In2science program, it was noted from students' feedback on surveys that the role of mentors is not clear. Some students mentioned that the mentor worked with them to help with homework, while others wrote about the mentor teaching part of a class. It is not possible to determine from the data if this was a result of the program's implementation practices or the teacher's flexibility in how the mentor is used.

At present, there are no data available on past students who have previously been involved in the In2science program and no follow-up of students currently participating. This means that program objectives—such as increasing the uptake of science and mathematics subjects in Years 11 and 12—cannot be measured.

While the student surveys currently used by the program examine students' attitudes towards science and mathematics, which is one aspect of the program, the current items are too broad in scope and do not focus on how the program operates or on the role of the mentor in the classroom.

Key recommendations

While the key findings indicate the value and importance of In2science, there are significant improvements that can be made to enhance the effectiveness of peer mentoring in science and mathematics.

- *The placement of mentors with teachers and classes should focus on how the teacher will work with the mentor to allow the best match of mentor, teacher and class.*
- *Provide teachers and students with more information to clarify the mentor's role in the classroom.*
- *The In2science program, with agreement from participating universities, should endeavour to organise mentor placements to coincide with school terms.*
- *In2science should continue to conduct detailed evaluations, in particular to assess the different ways that mentors work in the classroom to determine which modes are more effective with which students.*
- *A new evaluation of In2science should be conducted to determine the longer-term effects of the program, to determine whether the program influences the continued study of science and mathematics.*
- *In2science should discuss with participating schools and the Victorian Department of Education and Training protocols to allow follow-up of students to allow long-term evaluation of the effects of the program on students' subject choices.*
- *The In2science surveys should be simplified to include more items on the activities of the program and the role of the mentor in the classroom.*
- *Items that do not relate to the program should be removed from the surveys.*