Student attitudes to science

Seventy-one percent of students enjoy acquiring new knowledge in science, which is higher than the OECD average (67%)

Indicator Description
Students’ attitudes to science based on the Programme for International Student Assessment (PISA) survey.

Why This Is Important
International surveys of primary school age children generally reveal high levels of interest and positive attitudes to subjects such as science (OECD: PISA 2006). It is important that schools foster and strengthen this predisposition and ensure that young adults leave school with the motivation and capacity to continue learning throughout life.

Issues of motivation and attitudes are particularly relevant in science. Science and technology have enabled remarkable achievements over the past 100 years. However, there remain many scientific challenges, such as technological development, global warming, the depletion of fossil fuel resources and curing diseases.

How We Are Going
The Survey of Employers who have Recently Advertised (SERA, Department of Labour 2007) has found a severe shortage of physical, mathematical and engineering science professionals in New Zealand. Therefore an examination of attitudes of students to science at the time when they are deciding about their future careers is relevant.

The Programme for International Student Assessment (PISA), is a survey of 15-year-old students in OECD countries which allows international comparison of the results. PISA takes place every three years. In the 2006 PISA survey, 170 New Zealand schools participated in the study (out of the total of 500 secondary and composite schools in New Zealand). The students were asked about their attitudes to and engagement with science; specifically their interest in, enjoyment of and motivation to study science.
General interest in science

In New Zealand, PISA found that 66% of 15 year-old students reported high or medium interest in human biology, 55% reported high or medium interest in chemistry and 50% reported high or medium interest in astronomy. Other scientific topics - physics, biology of plants and geology - were less popular among 15 year-old students, with less than a half of them reporting high or medium interest in them.

Compared with OECD countries, only the percentage of students with the general interest in chemistry (55%) was higher than the OECD average (50%).

Students' responses for 8 statements were combined in order to derive an index of general interest in science.

In New Zealand, the general interest in science was equal among males and females, unlike in the OECD on average where male students had higher general interest in science than female students.

In New Zealand, the general interest in science was lowest for Māori and European/Pākehā. Asian students in New Zealand were more likely to have a higher general interest in science than any other ethnic group.

The general interest in science in New Zealand was higher than in Australia and Ireland, but lower than in the United Kingdom, United States and OECD average.

Enjoyment of science

In 2006, 71% of 15 year-old students in New Zealand agreed with the statement that they enjoy acquiring new knowledge in science which is higher than the OECD average (67%). The survey showed that in New Zealand, more than half of the participants have fun when they are learning science topics (62%), are interested in learning about science (65%) and are happy doing science problems (55%).

Students' responses for 5 statements were combined in order to derive an index of enjoyment of science.

A greater proportion of boys enjoyed science compared to girls in New Zealand as well as in the OECD on average.

In New Zealand, Asian students enjoyed science subjects the most while the lowest level of enjoyment was found among Māori students.

The enjoyment of science among 15 year-old students in New Zealand was about the same as the OECD average and United States but was higher than in Australia, Ireland and United Kingdom.
Motivation to learn science

In 2006, PISA found that in New Zealand, 71% of the participants study science because they know it is useful for them; approximately two-thirds of the 15-year-olds agreed with statements that studying science will improve their career prospects and will help them in getting a job.

Responses to in total 5 statements related to students’ motivation were combined to create an index of motivation to learn science.

There was no significant difference between boys and girls in motivation to learn science in New Zealand. This differs from the OECD average, where male students were more motivated to learn science than female students.

Asian students reported the highest motivation to learn science compared to other ethnic groups in New Zealand while Māori students reported the lowest motivation.

The level of motivation in New Zealand was the same as in the United Kingdom and very similar to Ireland, and that was higher than in Australia and the OECD average, but was lower than the United States.

Science-related career at the age of 30?

In 2006, 24% of 15 year-old students in New Zealand were expecting a science-related career at the age of 30. This is similar to the OECD average (25%) and the United Kingdom (25%), but is lower than Australia (28%) and Ireland (29%), and is considerably lower than the USA (38%).

### Percentage of students who agree with the statement about motivation (2006)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>(1) I study science because I know it is useful for me.</td>
<td>70%</td>
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<tr>
<td>(2) Making an effort in my science subject(s) is worth it because this will help me in the work I want to do later on.</td>
<td>70%</td>
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<tr>
<td>(3) Studying my science subject(s) is worthwhile for me because what I learn will improve my career prospects.</td>
<td>70%</td>
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<tr>
<td>(4) I will learn many things in my science subject(s) that will help me get a job.</td>
<td>70%</td>
</tr>
<tr>
<td>(5) What I learn in my science subject(s) is worthwhile for me because I need this for what I want to study later on.</td>
<td>70%</td>
</tr>
</tbody>
</table>

### Percentage of students expecting a science-related career at age 30 (2006)

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Australia</td>
<td>45%</td>
</tr>
<tr>
<td>Ireland</td>
<td>40%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>30%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>35%</td>
</tr>
<tr>
<td>United States</td>
<td>45%</td>
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</tbody>
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OECD average
Where To Find Out More

To explore student disengagement consider indicators:

- Truancy from school
- Non-enrolled students
- Stand-downs, suspensions, exclusions and expulsions from school
- Early leaving exemptions.

The Ministry of Education has established an Iterative Best Evidence Synthesis Programme to systematically identify, evaluate, analyse, synthesise and make accessible, relevant evidence linked to a range of learner outcomes. Evidence about what works for this indicator can be found in:

- Quality Teaching for Diverse Students in Schooling: Best Evidence Synthesis
- The Complexity of Community and Family Influences on Children’s Achievement in New Zealand: Best Evidence Synthesis.

References