# Briefing Note: New EDK series release: Teaching in New Zealand: findings from international studies

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<tr>
<th>To:</th>
<th>Hon. Chris Hipkins, Minister of Education</th>
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<td>5 July</td>
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<td>Security Level:</td>
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<td>METIS No:</td>
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<td>Drafter:</td>
<td>Emma Medina</td>
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<td>Key Contact:</td>
<td>Philip Stevens</td>
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<td>Messaging seen by Communications team:</td>
<td>No</td>
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<td>Round Robin:</td>
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## Purpose of Report

The purpose of this paper is for you to:

**Note** that the Ministry will release a new series of papers titled 'Teaching in New Zealand: findings from international studies' on Education Counts on 19 July.

**Agree** that this Briefing will be proactively released.

## Summary

- The Ministry will release a new series on Education Counts that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers.

- Eight papers, on topics ranging from adaptive instruction to ability grouping practices, will be published on 19 July as part of the series.

- The papers are timed to follow the release of the 2018 Teaching and Learning International Survey (TALIS) results which also gives insight into teaching practices in New Zealand and how they compare internationally.

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Dr Philip Stevens  
**General Manager Analysis, Research & Evaluation**  
**Education, Data and Knowledge**

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Hon Chris Hipkins  
**Minister of Education**

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5/7/19  
12/8/19
Background

7. The Educational Measurement and Assessment (EMA) team in EDK operates four international research studies in order to monitor the performance of the NZ education system as well as collect contextual information from student, teachers, parents and principals.
   a. Progress in International Reading Literacy Study (PIRLS)
   b. Trends in International Maths and Science Study (TIMSS)
   c. Programme for International Student Assessment (PISA)
   d. Teaching and Learning International Survey (TALIS)

8. Hattie (2009), after analysing over 800 studies concludes that “Teachers are among the most powerful influences in learning”. He estimates that after student background and disposition to learn, teachers are the second largest influence in student achievement. While attributes of the students, the school and the system are all important, what the teacher does inside and outside the classroom matter.

9. Grounded in the premise of the importance of teachers, we have developed a series of papers that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers.

10. The papers all generally follow the pattern of describing how frequently New Zealand teachers implement the instructional practice of interest compared with our international peers. The papers also explore what relationships exist between the teaching practice and student outcomes.

11. The paper titles are:
   a. Are New Zealand teachers adapting their lessons for student needs, and does it matter?
   b. Inquiry-based or teacher-directed science?
   c. Reading literacy instruction in English-language countries: similarities and differences
   d. How much feedback are students receiving from teachers?
   e. How often are students being assessed, and for what purposes?
   f. How much ‘choice’ and ‘voice’ are students given in their lessons?
   g. How often are students organised into same and mixed ability groups?
   h. Are teachers connecting lessons with students’ lives and prior knowledge?

12. The first paper (a) is attached in Annex 2. We can provide a copy or summary of all papers on request.

13. The purpose of the series is to provide objective reports which support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy.

Key Risks and Benefits

14. This series benefits the Ministry because it is a succinct synthesis of teaching practices in New Zealand with international comparisons not found elsewhere.

Educators and other educational practitioners benefit by using the information to reflect on their own practices.

15. A risk is that readers may focus on comparisons made between New Zealand teachers and their international peers, especially if they are not favourable. We make clear that the purpose is to provide an objective picture of instructional practices and not make judgements of teachers. The communications plan (Annex 3) contains messages to address this risk.

Next Steps

16. All papers will be published on 19 July on Education Counts.

Proactive Release

17. We recommend that this Briefing is proactively released as per your expectation that information be released as soon as possible. Any information which may need to be withheld will be done so in line with the provisions of the Official Information Act 1982.

Annexes

Annex 1: Teaching in New Zealand Series Product Scope
Annex 2: Copy of the one of the papers 'Are New Zealand teachers adapting their lessons for student needs, and does it matter?'
Annex 3: Communications Plan
Annex one: Teaching in New Zealand product scope
Teaching In New Zealand: findings from international studies

Education Insights

Product scope

Version June 2019
Overview

The New Zealand Curriculum (2007) and Te Marautanga o Aotearoa (2008) are designed to guide teaching and learning in New Zealand (in English-medium and Māori-medium respectively). These curricula are not prescriptive but rather give much leeway to teachers and kaiako in how they teach and what they teach.

Hattie (2009), after analysing over 800 studies concludes that “Teachers are among the most powerful influences in learning”. He estimates that below students, teachers are the second major source of variance in student achievement, contributing approximately 30%. While attributes of the students, the school, and the system are all important, what the teacher does, both inside and outside the classroom, matter.

Alton-Lee (2003) identified ten characteristics of quality teaching. These characteristics are interdependent and include the teacher’s orientation to learning, their pedagogical practices, and their planning and collaborative behaviours. How these characteristics apply in practice is, however, are "dependent on the curriculum area, and the experience, prior knowledge and needs of the learners in any particular context".

This series synthesises international research data to paint a picture of how these quality teaching characteristics play out in practice in New Zealand. The papers generally follow the pattern of describing how frequently New Zealand teachers implement the instructional practice of interest compared with our international peers. The papers also explore what, if any, relationships exist between the teaching practice and student outcomes. They end with reflection questions for the sector.

What are the aims and vision of the series?

<table>
<thead>
<tr>
<th>Vision</th>
<th>The series delivers a concise and objective synthesis of teaching practices in New Zealand which will support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy.</th>
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<tbody>
<tr>
<td>Aims</td>
<td>Each paper should be understandable by a wide professional audience, who may be well versed in education issues but not highly data savvy.</td>
</tr>
<tr>
<td>The series is easily accessible</td>
<td>The papers provides a comprehensive snapshot of teaching practices by pulling together information from across studies, which covers multiple year levels and subjects.</td>
</tr>
<tr>
<td>The series synthesises and integrates evidence across international studies</td>
<td>Analysis is error free, quality assured and any caveats are simply and clearly explained. It is easy to read and well written.</td>
</tr>
<tr>
<td>The series is high quality</td>
<td>Topics are useful to policy developers, school leaders, teachers and teacher educators. They highlight and indicate where further research or analysis may be helpful.</td>
</tr>
<tr>
<td>The series is influential and impactful</td>
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We shape an education system that delivers equitable and excellent outcomes

He mea tīrairē atou te mātauranga kia rangatira ai, kia mana taurite ai ōna huanga
How will we know we are getting there?

To help measure if the papers are achieving the aims of the series, we will monitor hits/download data and citation reviews. From time to time we will ask principals and teachers whether they are reading them and seek feedback on how they can be improved.

How will we disseminate and communicate the series?

The Teaching in New Zealand series will be posted on Education Counts. Presentations for Ministry staff will be scheduled, with the potential for presentations to teachers and school leaders to occur in the future.

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<thead>
<tr>
<th>Channel</th>
<th>Vehicle</th>
<th>Product</th>
<th>Audience</th>
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<tbody>
<tr>
<td>Ministry Websites</td>
<td>Education Counts</td>
<td>Short summary of specific paper and seek feedback on the series</td>
<td>Cross Sector and Public</td>
</tr>
<tr>
<td></td>
<td>Te Tāhuhu</td>
<td>Page advertising the specific paper</td>
<td>Ministry</td>
</tr>
<tr>
<td></td>
<td>Te Kete Ipurangi</td>
<td>Short summary blurb</td>
<td>Schooling</td>
</tr>
<tr>
<td>Ministry Publications</td>
<td>Education Gazette</td>
<td>Summary article and link</td>
<td>Cross sector</td>
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<td></td>
<td>School Leaders Bulletin</td>
<td>Summary article and link</td>
<td>School leaders</td>
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<td>Webinars</td>
<td>Author-Hosted Webinar</td>
<td>Webinar</td>
<td>Cross sector</td>
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<td>Presentations</td>
<td>Knowledge Seminar</td>
<td>Presentation</td>
<td>Ministry and Education Agencies</td>
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<td>EDK learning Bites/Te Hiko</td>
<td>Presentation</td>
<td>Ministry (mainly EDK)</td>
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<td></td>
<td>Key stakeholder presentation</td>
<td>Presentation</td>
<td>Ministry and Education Agencies</td>
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<tr>
<td></td>
<td>Other Ministry group's presentation series</td>
<td>Presentation</td>
<td>Other specific Ministry Groups, eg, ELSA</td>
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Consultation and communication process:
The process for consultation and communication is outlined below.

1. Analysis & Writing (including Q&A, proofreading)
2. Post on EDK Internal Papers confluence page and send to relevant teams for consultation. Revise as needed.
3. Send draft and any other communication documents to manager and GM for review and sign-off. Revise as needed. Use editor or proof-reader as needed, making sure the papers are in consistent style.
4. Send final draft and any other communication documents to Dep Sec for review and sign-off.

We shape an education system that delivers equitable and excellent outcomes
He mea tārair e mātou te mātauranga kia rangatira ai, kia mana tauite ai ōne huanga

6. Share publication with stakeholders via the channels previously mentioned. Dep Sec sends LT email. Publication included in next EWU.
Current and Future Papers

The papers below are currently drafted and ready to be released:
- Are New Zealand teachers adapting their lessons for student needs, and does it matter?
- Inquiry-based or teacher-directed science? Evidence from PISA
- Reading literacy instruction in English-language countries: similarities and differences
- How often are students being assessed, and for what purposes?
- How much feedback are students receiving from teachers?
- How much 'voice' and 'choice' are students given?
- Ability Grouping in New Zealand
- Making connections in the classroom

The papers below are scheduled to be prepared for the series.
- Teacher knowledge and confidence

Additional papers will be prepared in the future. There may also be updates to the papers as studies release more recent data.
Appendix one: Writing standards

- Write for the audience. Make it easy for them to understand the main findings.

- Plan before you write –
  - What are the most important things to say? This needs to come first
  - What doesn’t the reader need to know – what isn’t vital and can be removed?
  - What is the current context that sits around the evidence you are writing about and how will you connect with this?
  - How might a reader use this information and how can you make it easy for them to do so?
  - Scope out what your key messages and conclusions will be – what are the insights you are presenting?
  - How will you order the information and make a sensible and logical story – if the reader only read the first line of each section – would they have some idea of what was important?
  - How will you use graphs and graphics to best effect? Don’t be limited to bar graphs – if you want to use some simple graphics or photos do so. For approved photos contact visual.identity@education.govt.nz.

- Must adhere to the Ministry Style guide and use the template provided.

- Remember to check the basics:
  - The tone and style is plain English but not journalistic – stay factual and based in evidence. Be clear not to imply causality if you can’t prove it. But don’t be afraid to posit a possible hypothesis or potential connection to help the reader set your work in context. Provide a balanced picture of the findings.
  - Check your language tenses – be careful not to apply present or future tense if the data is past point in time.
  - Ensure graphs have clear titles, keys and axis labels – be careful not to overinflate (or undercook) a finding by having especially large or small scales.
  - Use footnotes and references appropriately.
  - Ensure the correct use of numerals versus written numbers, % v percentage etc (see style guide).
  - Ensure writing is error free – no spelling or grammar mistake
Annex two: Are New Zealand teachers adapting their lessons for student needs, and does it matter?
Teaching in New Zealand: findings from international studies

Are New Zealand teachers adapting their lessons for student needs, and does it matter?

Summary
This paper describes what adaptive teaching looks like in New Zealand using data from international research studies. Examining how often teachers implement adaptive instruction and how confidently they do so shows whether teachers are prepared and willing to use this instructional technique. The paper also explores the relationship between adaptive instruction and student outcomes, such as academic performance and motivation. The findings will be relevant to those seeking a deeper knowledge of the instructional tools teachers are using in today’s classrooms.

Key Findings
- There is strong evidence of Year 5 reading teachers adapting their lessons regularly. Nine out of ten reading students have teachers who provide materials appropriate for the reading levels of individual students in every lesson or almost every lesson.
- Year 5 maths and science teachers are less confident in implementing adaptive instruction compared with their international peers. Despite this, students report that adaptive teaching occurs often, with the majority agreeing their teacher does a variety of things to help them learn, similar to the international average.
- A slightly smaller proportion of Year 9 students report that adaptive teaching occurs, but this proportion is also similar to the international average. And secondary teachers report relatively high confidence in implementing adaptive teaching methods compared with international averages. According to 15-year-old students, their science teachers adapt their science lessons more than teachers in most countries.
- For many students, adaptive instruction methods are associated with higher performance, on average, across subjects and year levels. However, for Māori 15-year-old students, adaptive instruction is associated with lower science performance, after accounting for student and school socioeconomic characteristics.
- Adaptive teaching in 15-year-old students' science lessons is also associated with a positive disciplinary climate, supportive teachers, teachers giving students feedback, increased student enjoyment, interest in and epistemic beliefs about science, greater confidence and motivation in science, and an increased sense of belonging.
Background

Adaptive teaching is a practice where teachers are actively evaluating the impact of their lessons and adapting the structure or content of the lesson in a way that leads to optimal learning outcomes for the whole class, based on their students' knowledge, skills and interests (Borich, 2011; Hattie & Yates, 2013). In this way, teachers take on the role of not only activators of learning, but also evaluators of that activation, and change course accordingly.

Teachers can adapt the lesson in several ways. For instance, when a class is having trouble understanding a lesson, teachers can alter the lesson materials, the structure of the lesson or the way the content is presented. An adaptive teacher is broadly the opposite of a teacher who has identified what has worked for them before and so uses their preferred routine method repeatedly. An adaptive teacher knows that if a student is not learning, the student does not need ‘more’ but rather ‘different’ (Pearson & Hoffman, 2011).

Much research has been done on the importance of adaptive instruction, but evidence from international studies can now describe whether New Zealand teachers are adapting their lessons and how this practice is related to student outcomes in the New Zealand context.

Results

Year 5 science teachers are less confident in adaptive teaching than teachers internationally, and less confident than Year 5 maths teachers as well.

A little over 60% of Year 5 science teachers report being confident in adapting their teaching to engage student interest, compared with over 80% internationally. Only three other countries have teachers who report such low confidence levels. More Year 5 maths teachers report confidence in adapting to student interest and this figure is closer to the international average (84% and 86% respectively).

A mere 35% of Year 5 science teachers report being confident in their ability to provide challenging tasks for high achieving students, much lower than the international average of 59%, and 81% of Year 5 maths teachers. This low confidence may be because Year 5 teachers in New Zealand teach a relatively low number of hours of science per year (43 versus the international average of 76 hours) and thus do not have enough opportunity to develop this skill using science content (Gaygill, Singh, & Hanlar, 2016).

Figure 1. Proportion of science teachers responding ‘high’ or ‘very high’ to ‘in teaching science to this class, how would you characterise your confidence in doing the following?’

...adapting my teaching to engage students' interests

...providing challenging tasks for the highest achieving students

[Graph showing comparison between New Zealand and international responses]

Source: TIMSS 2014/15 Almanac

1 Teachers were given the response options of ‘low’, ‘medium’, ‘high’ or ‘very high’. In this paper, teachers are confident if they responded ‘high’ or ‘very High’.
Overall, Year 9 teachers are relatively confident in implementing adaptive teaching methods.

Year 9 teachers’ confidence levels related to adaptive teaching are broadly similar to or slightly below the international and Organisation for Economic Co-operation and Development (OECD) averages, but this varies across subjects and adaptation strategies. Science teachers at this year level were more confident in adapting lessons to student interest (81% compared with 72% of maths teachers), while maths teachers were more confident in providing challenging tasks for higher achieving students (74% compared with 60% of science teachers).

TALIS also asks secondary (Year 7-10) teachers to what extent they can implement adaptive teaching and this data shows they have slightly higher confidence levels than international averages but confidence still varies by strategy. Secondary teachers report they are more confident in providing alternative explanations (96% responding ‘a lot’ or ‘quite a bit’) than in implementing alternative instructional strategies (82%). This suggests teachers may be more comfortable providing small adaptations, such as alternative explanations, than larger changes such as to instructional strategies.

**Figure 2. Proportion of Year 7-10 teachers’ responses to ‘In your teaching, to what extent can you do the following?’**

<table>
<thead>
<tr>
<th>Implementation</th>
<th>New Zealand</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement alternative instructional strategies in my classroom</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>Provide an alternative explanation for example when students are confused</td>
<td>58</td>
<td>48</td>
</tr>
</tbody>
</table>

Source: TALIS 2013/14 database
Values under 3 are not labeled

One aspect of adaptive teaching is evaluating if students are learning throughout the lesson and the majority of Year 5 reading and maths teachers do this.

Well over half (58%) of students’ reading teachers ask if their students need clarification about what they are reading every day or almost every day and just 5% do this less than weekly. Figure 3 shows the majority of Year 5 reading and maths students have teachers who report they place a major emphasis on assessing students’ ongoing work (71% and 84%) to monitor student progress.

However, a smaller proportion of Year 5 science and Year 9 science and maths teachers report the same, below the international average. When compared with all other countries, New Zealand is one of the five lowest countries for the proportion of students’ Year 5 science and Year 9 maths and science teachers placing a major emphasis on the assessment of student work to monitor progress.
In primary reading there is strong evidence of teachers adapting their lessons often.

Nearly 90% of primary reading students have teachers who provide materials appropriate for the reading levels of individual students in every lesson or almost every lesson, much higher than the international average of 38% (Figure 4). Over 90% of Year 5 reading students also agree (a little or a lot) that their teacher ‘does a variety of things to help me learn’ and ‘tells me how to do something differently when I make a mistake’, similar to the international average (Figure 5). And nearly all (98%) primary reading students report that their teachers change teaching approach and try something different when a student falls behind in reading.
In maths and science classrooms, Year 5 students indicate adaptive teaching occurs often, but less so for Year 9 students.

Ninety percent of Year 5 students agree a lot or a little that their science and maths teachers ‘do a variety of things to help them learn’ and tell them ‘how to do better when they make a mistake’ (similar to the international average). However, by Year 9, students’ agreement with those statements drops to around 80% (Figure 5).

**Figure 5. Proportion of students’ agreement with the statements...**

<table>
<thead>
<tr>
<th>...my teacher does a variety of things to help me learn</th>
<th>...my teacher tells me how to do better when I make a mistake.</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Graph showing agreement rates for New Zealand and International]</td>
<td></td>
</tr>
</tbody>
</table>

*Source: TIMSS 2014/15 Almanac & PIRLS 2015/16 Almanac*

15-year-olds in New Zealand reported their science teachers adapt their lessons more frequently than the OECD average and most other countries.

In 2015 PISA asked 15-year-old students about their science teacher’s frequency of adapting lessons to students’ needs and providing individual help. The items were combined to create an adaptive teaching index and New Zealand was in the top 10 countries with the highest adaptive teaching index scores. Over half of 15-year-olds reported their teacher adapts lessons to their class’s needs and provides individual help to students in many lessons or almost every lesson. Still, 16% of students reported their teacher never changes the structure of the lesson on a topic that most students find difficult to understand.

**Figure 6. Proportion of 15-year-old students who report their teachers adapting science lessons**

<table>
<thead>
<tr>
<th>The teacher adapts the lesson to my class’s needs and knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Graph showing proportion of students reporting]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The teacher provides individual help when a student has difficulties understanding a topic or task</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Graph showing proportion of students reporting]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>The teacher changes the structure of the lesson on a topic that most students find difficult to understand</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Graph showing proportion of students reporting]</td>
</tr>
</tbody>
</table>

*Source: PISA 2015 Results Volume II (OECD, 2016), Table II.2.23*
Adaptive teaching is associated with a positive disciplinary climate and teachers who are supportive of and give feedback to their students.

It can be important to look at what conditions enable – or hinder – adaptive teaching practices. Investigating where this practice is occurring more often found that there were no consistent differences in the use of adaptive teaching between disadvantaged and advantaged schools, private and public, or rural and urban schools. One exception was that Year 5 reading teachers provided reading material that matched the interests of students more frequently in disadvantaged schools, possibly as a way for teachers to engage low performers more in reading.

Figure 7 shows that a one-unit increase in the PISA index of disciplinary climate in science lessons is associated with an increase in the index of adaptive teaching in science lessons, and the increase changes very little even after accounting for student and school socioeconomic status and science performance. This suggests that an orderly learning environment is a necessary precondition for teachers to be able to use diverse learning strategies and support individual students. TIMSS Year 9 showed a similar pattern, where students in 'very safe and orderly schools', according to their teachers, agreed more that their teachers did a variety of things to help them learn and told them how to do things differently when they made a mistake.

Figure 7 also shows that, among teachers of 15-year-olds, teacher support in science lessons are highly associated with adaptive teaching in that a one-unit increase in the PISA index of adaptive teaching in science lessons is linked to a large increase in both indices. PIRLS data also confirms the relationship with feedback and adaptive teaching in that primary reading teachers who give individual feedback to students also reported more frequently providing reading material that matches student interests and reading levels. Interestingly, adaptive teaching in science lessons is also associated with science classrooms where both inquiry and teacher-directed instruction are occurring, indicating adaptive teaching is compatible with different instructional styles.

**Figure 7.** Change in the PISA index of adaptive teaching in science lessons per one-unit increase in the index of disciplinary climate, inquiry-based teaching, teacher-directed instruction, perceived feedback and teacher support.

![Graph showing changes in PISA indices](image)

Source: PISA 2015 database

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2 Schools in the bottom quarter of the PISA Index of economic, social, and cultural status (ESCS) are classified as disadvantaged and schools in the top quarter of ESCS are classified as advantaged.

3 Poor disciplinary climate was measured using student-reported responses to questions on students not listening to the teacher, noise and disorder, and students being unable to work in class.

4 Teacher support in science lessons was measured using student-reported responses to questions on a teacher's interest in every student learning, giving extra help, and continuing to teach until students understand.

5 Perceived feedback in science lessons was measured using student-reported responses to questions on the teacher telling students how they are performing, what their strengths are, how they can improve, and how they can reach learning goals.
For many students, adaptive instruction methods are associated with higher performance, on average, across subjects and year levels.

In PISA, a one-unit increase in the index of adaptive teaching in science lessons amounts to a 10-point increase in science score, and a 7-point increase in science score after accounting for school and student characteristics (Figure 8), which is equivalent to a difference in performance of about one school term. However, in the individual statements PISA asks about adaptive teaching, no relationship was found between science performance and teachers who 'change the structure of the lesson on a topic that most students find difficult to understand' (Figure 8).

**Figure 8. Relationship between PISA science scores and adaptive teaching**

Change in PISA science performance associated with a one-unit increase in the index of adaptive teaching in science lessons

PISA science score of students by response to adaptive teaching practices

Source: PISA 2015 Results Volume II (OECD, 2016), Table II.2.24 and PISA 2015 database

Curiously, the association between higher science performance and adaptive teaching did not hold true for all students. For Māori and Asian students, a one-unit increase in the adaptive teaching index resulted in no significant change in students’ PISA science score, and for Māori there was a decrease in science score after accounting for student and school socioeconomic status and the school’s disciplinary climate. This suggests that lower performing Māori students are more exposed to adaptive teaching. Conversely, for Pākehā and Pacific students, higher performing students are more exposed to adaptive teaching, after accounting for student and school socioeconomic status and the school’s disciplinary climate.
TIMSS and PIRLS show a similar positive association between adaptive teaching and performance. Students who agreed their teacher does a variety of things to help them learn and tells them how to do something differently if they make a mistake scored higher than those who disagreed, even after accounting for school decile (Figure 9). The only exception is for Year 5 maths and science students: there was no difference for students who agreed their teachers do something differently if they make a mistake.

**Figure 9.** Change in the reading, maths and science scores for students who agreed or strongly agreed with the adaptive teaching statements ‘My teacher...’\(^6\)

![Graph showing change in reading, maths, and science scores](image)

Source: TIMSS 2014/15 and PIRLS 2015/16 database

In addition to a general increase in science performance, according to PISA data, adaptive teaching is also associated with many advantageous student mindsets.

Figure 10 shows that a one-unit increase in the PISA index of adaptive teaching is linked to higher student motivation, enjoyment of science, epistemic beliefs, interest in broad science topics, sense of belonging and self-efficacy. All increases are statistically significant, even after accounting for student and school characteristics.

**Figure 10.** Change in the index of mindsets associated with a one-unit increase on the index of adaptive teaching in science lessons

![Graph showing change in index of mindsets](image)

Source: PISA 2015 database

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\(^6\) Changes in scores that are statistically significant are dark blue and dark grey; changes that are not statistically significant are light blue and light grey.
Conclusion

Near the end of his career, educational psychologist Richard Snow (1997) concluded:

Students differ from one another in dozens of important ways that reflect cultural as well as individual characteristics. Minute by minute and month by month, we must decide when and how to adapt to the characteristics of particular students, when and how not to do so, and which student characteristics to attend to in either case... When done well, it is an awesome balancing act. (p. 355)

This balancing act – adaptive teaching – is associated with many positive benefits for many students: increased science performance, greater interest and enjoyment of the subject, greater confidence and motivation and even a greater sense of belonging at school generally. And so it is important for teachers to consider how often they are adapting lessons to students' needs and interests, monitoring student understanding throughout a lesson, and pivoting when students aren't progressing.

It has been shown that many New Zealand students agree their teachers adapt their instruction, and the results are similar to, or better than, other countries. This indicates that the practice is embedded in most classrooms. However, it was shown that not all students were exposed to the same amounts of adaptive instruction. Low performing Māori and Asian students and high performing Pacific and Pākehā students experience adaptive instruction the most. Thus there is a need and opportunity for adaptive instruction to be universal in all classrooms for all students of all backgrounds and abilities.

An emerging theme that came out of the Education Conversation online survey was the need for more learning support and a more inclusive education for students with additional needs⁷. The Tomorrow's Schools Review report also concluded that students with learning support requirements do not have the same access to schooling as other students. Having teachers trained and confident in adaptive instruction for all students, especially for Year 5 science teachers where confidence is lowest, would help achieve the goal of a more inclusive education system.

Reflection questions for teachers and those who support teachers

- How often are formative assessments used during lessons to monitor student progress?
- Are common misunderstandings identified in advance with alternate ways to teach or demonstrate the key concepts?
- How often are students' interests used to adapt lesson materials?
- How can technology be used so that all students can access key concepts and tasks?
- Are students given multiple opportunities and ways to access and practice key concepts and tasks?

Research methods and data sources

This paper synthesises assessment and questionnaire data from four international studies.

TIMSS 2014/15 assessed the maths and science abilities of Year 5 and Year 9 students. PIRLS 2015/16 assessed Year 5 students’ reading literacy. Background information was collected from students, teachers and schools. Both of these studies were conducted by the International Association for the Evaluation of Educational Achievement’s (IEA’s) TIMSS & PIRLS International Study Center.

PISA 2015 assessed students aged 15 years in mathematics, science and reading, with a main focus on science. Background information was collected from the student and their school. TALIS focuses on teachers and principals of Year 7-10 students. Information was collected on teachers’ working conditions, attitudes about teaching, and teaching practices. Both of these studies were conducted by the Organisation for Economic Co-operation and Development (OECD).

Since the studies focus on different year levels and subjects, and are conducted by two different research organisations, the questionnaire items are different across studies. PISA developed their questionnaire with the intention of measuring adaptive instruction using an index, while the other studies did not develop their questionnaire with this in mind.

Authored by Emma Medina

For further data and information on the international studies, please visit https://www.educationcounts.govt.nz/topics/research.

For further information, questions or discussion around additional analysis and potential topics please contact Requests.EDK@education.govt.nz
References


We shape an education system that delivers equitable and excellent outcomes

He mea tārai e mātou te mātauranga kia rangatira ai, kia mana taurite ai ōna huanga
Communications Plan

Release of EDK series ‘Teaching in New Zealand: findings from international studies’

Wednesday, 5 June 2019

Background and strategic context

The Educational Measurement and Assessment (EMA) team in EDK operates four international research studies in order to monitor the performance of the NZ education system as well as collect contextual information from student, teachers, parents and principals.

- Progress in International Reading Literacy Study (PIRLS)
- Trends in International Maths and Science Study (TIMSS)
- Programme for International Student Assessment (PISA)
- Teaching and Learning International Survey (TALIS)

Grounded in the premise of the importance of teachers, EDK has developed a series of papers that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers. The eight papers describe how often teachers implement various teaching practices such as adaptive instruction, ability grouping, assessment, and feedback (based on teacher and student responses to questionnaires).

Communications objectives

The purpose of the series is to provide objective reports which will support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy. To that end, the primary objective of the communications plan is to make key stakeholders aware of the series.

Key messages

- Teachers are one of the most important levers for student learning. Hattie (2003) estimates that teachers account for roughly 30% of variance in student achievement.

- Because teachers are so important, a series of papers have been developed using international research data to describe how often teachers implement various teaching practices relative to our international peers. Relationships between instructional practices and academic and non-academic outcomes are also explored.

- By painting a picture of what different instruction practices look like in New Zealand, the goal of the series is to support and inform sector support, the teaching profession, and the policy work of the Ministry.
Communications issues and concerns

Identify any communications issues or concerns. What is the likelihood of this occurring? How much impact would this have if it occurred? What is being done to address these concerns?

<table>
<thead>
<tr>
<th>Communication issues, concerns</th>
<th>Likelihood (high, moderate, low)</th>
<th>Impact (high, moderate, low)</th>
<th>Mitigation (what is being done or will be done to address the concerns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A risk is that readers and/or media may focus on the comparisons made between New Zealand teachers and their international peers, especially if it is not favourable.</td>
<td>Low</td>
<td>Moderate</td>
<td>The papers are objective reports of data collection from teacher and student questionnaires without speculation, interpretation or judgement.</td>
</tr>
</tbody>
</table>

Communications activities

Identifies - Audiences, What they need to know: channels, products, when, and who responsible.

<table>
<thead>
<tr>
<th>Product or activity</th>
<th>Audience (who needs to know?)</th>
<th>Objective/ What do they need to know?</th>
<th>Channel</th>
<th>Due Date/ When</th>
<th>Who responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papers</td>
<td>Sector, media, parents, Ministry</td>
<td>The release and where to find the papers</td>
<td>Education Counts</td>
<td>19 July</td>
<td>EMA / Emma Medina</td>
</tr>
<tr>
<td>Summary and blurb</td>
<td>School leaders</td>
<td>The release and where to find the papers</td>
<td>Bulletin</td>
<td>29 July</td>
<td>Emma Medina</td>
</tr>
<tr>
<td>Summary and blurb</td>
<td>Schooling</td>
<td>The release and where to find the papers</td>
<td>Te Kete Ipurangi</td>
<td>29 July</td>
<td>Emma Medina</td>
</tr>
<tr>
<td>Summary article and link</td>
<td>Sector</td>
<td>The release and where to find the papers</td>
<td>Education Gazette</td>
<td>TBD</td>
<td>Emma Medina</td>
</tr>
<tr>
<td>PowerPoint presentation</td>
<td>Ministry</td>
<td>The main findings</td>
<td>EDK learning bites/Te Hiko presentations</td>
<td>TBD</td>
<td>EMA / Emma Medina</td>
</tr>
<tr>
<td>Email to peak bodies</td>
<td>Sector</td>
<td>The release and where to find the papers</td>
<td>Email</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>
## Sign off process

The tentative release date is 19 July.

<table>
<thead>
<tr>
<th>Signoff</th>
<th>Who</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author – business unit and/or comms</td>
<td>Emma</td>
<td>6 June</td>
</tr>
<tr>
<td>Read by/input provided (business owners and impacted business units)</td>
<td>ELSA</td>
<td>25 June</td>
</tr>
<tr>
<td>Approver/role/business unit</td>
<td>Philip</td>
<td>3 July</td>
</tr>
<tr>
<td>Final sign off - responsible Dep Sec(s)</td>
<td>Craig Jones</td>
<td>4 July</td>
</tr>
</tbody>
</table>
Teaching in New Zealand: findings from international studies

On 19 July EDK is releasing a new series of papers titled ‘Teaching in New Zealand: findings from international studies’ on Education Counts.

Grounded in the premise of teachers being one of the most important levers in student learning, the papers synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers. The topics range from adaptive instruction to ability grouping. The papers also explore what relationships exist between the teaching practice and student outcomes.

Deputy Secretary: Dr Craig Jones 027 406 3964
Owner: Barclay Anstiss 027 403 5657
To: Iona Holsted
Author: Emma Medina
Approved: Craig Jones, Deputy Secretary, EDK
cc: 
Date: 19 July 2019
Subject: Release of new EDK papers ‘Teaching in New Zealand: findings from international studies’

Purpose

1. This memo is to inform you of the release of a new EDK series of papers titled ‘Teaching in New Zealand: findings from international studies’. The papers synthesise international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers.

2. Eight papers, on topics ranging from adaptive instruction to ability grouping practices, will be published on 19 July.

Background

3. The Educational Measurement and Assessment (EMA) team in EDK operates four international research studies in order to monitor the performance of the NZ education system as well as collect contextual information from student, teachers, parents and principals.
   - Progress in International Reading Literacy Study (PIRLS)
   - Trends in International Maths and Science Study (TIMSS)
   - Programme for International Student Assessment (PISA)
   - Teaching and Learning International Survey (TALIS)

4. Hattie (2009), after analysing over 800 studies concludes that “Teachers are among the most powerful influences in learning”\(^1\). He estimates that after student background and disposition to learn, teachers are the second largest influencer in student achievement. While attributes of the students, the school and the system are all important, what the teacher does inside and outside the classroom matter.

5. Grounded in the premise of the importance of teachers, EDK has developed a series of papers that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers.

6. The papers all generally follow the pattern of describing how frequently New Zealand teachers implement the instructional practice of interest compared with our international peers. The papers also explore what relationships exist between the teaching practice and student outcomes.

7. The paper titles are:

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Are New Zealand teachers adapting their lessons for student needs, and does it matter?
Inquiry-based or teacher-directed science?
Reading literacy instruction in English-language countries: similarities and differences
How much feedback are students receiving from teachers?
How often are students being assessed, and for what purposes?
How much ‘choice’ and ‘voice’ are students given in their lessons?
How often are students organised into same and mixed ability groups?
Are teachers connecting lessons with students’ lives and prior knowledge?

8. The purpose of the series is to provide objective reports which support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy.

9. The papers are timed to follow the release of the 2018 Teaching and Learning International Survey (TALIS) results which also gives insight into teaching practices in New Zealand and how they compare internationally.

Next steps
10. EDK will send a briefing note to the Minister on 5 July, a draft is attached for your reference.

11. The papers will be published on 19 July on Education Counts.

Attachments
- Attachment 1: Briefing – New EDK series release: Teaching in New Zealand: findings from international studies
- Attachment 2: Communications Plan
- Attachment 3: Teaching in New Zealand product scope
- Attachment 4: Copy of the first paper ‘Are New Zealand teachers adapting their lessons for student needs, and does it matter?’

Dr Craig Jones
Deputy Secretary
Evidence, Data and Knowledge

Date:

-------------------------
Noted

Approved/Not Approved

Comment:

__________________________________________

Proactively Released
Briefing Note: New EDK series release: Teaching in New Zealand: findings from international studies

To: Hon. Chris Hipkins, Minister of Education

Date: 5 July  
Priority: Low

Security Level: In Confidence  
METIS No: 1191461

Drafter: Emma Medina  
DDI: 64 4 439 5013

Key Contact: Philip Stevens  
DDI: 64 4 439 5357

Messaging seen by Communications team: No  
Round Robin: No

Purpose of Report

The purpose of this paper is for you to:

Note that the Ministry will release a new series of papers titled ‘Teaching in New Zealand: findings from international studies’ on Education Counts on 19 July.

Agree that this Briefing will be proactively released.

Agree / Disagree

Summary

- The Ministry will release a new series on Education Counts that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers.
- Eight papers, on topics ranging from adaptive instruction to ability grouping practices, will be published on 19 July as part of the series.
- The papers are timed to follow the release of the 2018 Teaching and Learning International Survey (TALIS) results which also gives insight into teaching practices in New Zealand and how they compare internationally.

Dr Philip Stevens  
General Manager Analysis, Research & Evaluation Education, Data and Knowledge

Hon Chris Hipkins  
Minister of Education

05/07/2019
Background

7. The Educational Measurement and Assessment (EMA) team in EDK operates four international research studies in order to monitor the performance of the NZ education system as well as collect contextual information from student, teachers, parents and principals.
   a. Progress in International Reading Literacy Study (PIRLS)
   b. Trends in International Maths and Science Study (TIMSS)
   c. Programme for International Student Assessment (PISA)
   d. Teaching and Learning International Survey (TALIS)

8. Hattie (2009), after analysing over 800 studies concludes that “Teachers are among the most powerful influences in learning”. He estimates that after student background and disposition to learn, teachers are the second largest influencer in student achievement. While attributes of the students, the school and the system are all important, what the teacher does inside and outside the classroom matter.

9. Grounded in the premise of the importance of teachers, we have developed a series of papers that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers.

10. The papers all generally follow the pattern of describing how frequently New Zealand teachers implement the instructional practice of interest compared with our international peers. The papers also explore what relationships exist between the teaching practice and student outcomes.

11. The paper titles are:
   a. Are New Zealand teachers adapting their lessons for student needs, and does it matter?
   b. Inquiry-based or teacher-directed science?
   c. Reading literacy instruction in English-language countries: similarities and differences
   d. How much feedback are students receiving from teachers?
   e. How often are students being assessed, and for what purposes?
   f. How much ‘choice’ and ‘voice’ are students given in their lessons?
   g. How often are students organised into same and mixed ability groups?
   h. Are teachers connecting lessons with students’ lives and prior knowledge?

12. The first paper (a) is attached in Annex 2. We can provide a copy or summary of all papers on request.

13. The purpose of the series is to provide objective reports which support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy.

Key Risks and Benefits

14. This series benefits the Ministry because it is a succinct synthesis of teaching practices in New Zealand with international comparisons not found elsewhere.

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Educators and other educational practitioners benefit by using the information to reflect on their own practices.

15. A risk is that readers may focus on comparisons made between New Zealand teachers and their international peers, especially if they are not favourable. We make clear that the purpose is to provide an objective picture of instructional practices and not make judgements of teachers. The communications plan (Annex 3) contains messages to address this risk.

Next Steps

16. All papers will be published on 19 July on Education Counts.

Proactive Release

17. We recommend that this Briefing is proactively released as per your expectation that information be released as soon as possible. Any information which may need to be withheld will be done so in line with the provisions of the Official Information Act 1982.

Annexes

Annex 1: Teaching in New Zealand Series Product Scope
Annex 2: Copy of the one of the papers 'Are New Zealand teachers adapting their lessons for student needs, and does it matter?'
Annex 3: Communications Plan
Annex one: Teaching in New Zealand product scope
Teaching In New Zealand: findings from international studies

Education Insights

Product scope

Version June 2019
Overview

The New Zealand Curriculum (2007) and Te Marautanga o Aotearoa (2008) are designed to guide teaching and learning in New Zealand (in English-medium and Māori-medium respectively). These curricula are not prescriptive but rather give much leeway to teachers and kaiako in how they teach and what they teach.

Hattie (2009), after analysing over 800 studies concludes that “Teachers are among the most powerful influences in learning”. He estimates that below students, teachers are the second major source of variance in student achievement, contributing approximately 30%. While attributes of the students, the school, and the system are all important, what the teacher does, both inside and outside the classroom, matter.

Alton-Lee (2003) identified ten characteristics of quality teaching. These characteristics are interdependent and include the teacher’s orientation to learning, their pedagogical practices, and their planning and collaborative behaviours. How these characteristics apply in practice is, however, are "dependent on the curriculum area, and the experience, prior knowledge and needs of the learners in any particular context".

This series synthesises international research data to paint a picture of how these quality teaching characteristics play out in practice in New Zealand. The papers generally follow the pattern of describing how frequently New Zealand teachers implement the instructional practice of interest compared with our international peers. The papers also explore what, if any, relationships exist between the teaching practice and student outcomes. They end with reflection questions for the sector.

What are the aims and vision of the series?

<table>
<thead>
<tr>
<th>Vision</th>
<th>The series delivers a concise and objective synthesis of teaching practices in New Zealand which will support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims</td>
<td>Each paper should be understandable by a wide professional audience, who may be well versed in education issues but not highly data savvy.</td>
</tr>
<tr>
<td>The series is easily accessible</td>
<td>The papers provides a comprehensive snapshot of teaching practices by pulling together information from across studies, which covers multiple year levels and subjects.</td>
</tr>
<tr>
<td>The series synthesises and integrates evidence across international</td>
<td>Analysis is error free, quality assured and any caveats are simply and clearly explained. It is easy to read and well written.</td>
</tr>
<tr>
<td>studies</td>
<td>The series is high quality</td>
</tr>
<tr>
<td>The series is high quality</td>
<td>The series is influential and impactful</td>
</tr>
<tr>
<td>The series is influential and impactful</td>
<td>Topics are useful to policy developers, school leaders, teachers and teacher educators. They highlight and indicate where further research or analysis may be helpful.</td>
</tr>
</tbody>
</table>
How will we know we are getting there?

To help measure if the papers are achieving the aims of the series, we will monitor hits/download data and citation reviews. From time to time we will ask principals and teachers whether they are reading them and seek feedback on how they can be improved.

How will we disseminate and communicate the series?

The Teaching in New Zealand series will be posted on Education Counts. Presentations for Ministry staff will be scheduled, with the potential for presentations to teachers and school leaders to occur in the future.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Vehicle</th>
<th>Product</th>
<th>Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry Websites</td>
<td>Education Counts</td>
<td>Short summary of specific paper and seek feedback</td>
<td>Cross Sector and Public</td>
</tr>
<tr>
<td></td>
<td>Te Tāhuhu</td>
<td>Page advertising the specific paper</td>
<td>Ministry</td>
</tr>
<tr>
<td></td>
<td>Te Kete Ipurangi</td>
<td>Short summary blurb</td>
<td>Schooling</td>
</tr>
<tr>
<td>Ministry Publications</td>
<td>Education Gazette</td>
<td>Summary article and link</td>
<td>Cross sector</td>
</tr>
<tr>
<td></td>
<td>School Leaders Bulletin</td>
<td>Summary article and link</td>
<td>School leaders</td>
</tr>
<tr>
<td>Webinars</td>
<td>Author-Hosted Webinar</td>
<td>Webinar</td>
<td>Cross sector</td>
</tr>
<tr>
<td>Presentations</td>
<td>Knowledge Seminar</td>
<td>Presentation</td>
<td>Ministry and Education</td>
</tr>
<tr>
<td></td>
<td>EDK learning Bites/Te Hiko</td>
<td>Presentation</td>
<td>Ministry (mainly EDK)</td>
</tr>
<tr>
<td></td>
<td>Key stakeholder presentation</td>
<td>Presentation</td>
<td>Ministry and Education</td>
</tr>
<tr>
<td></td>
<td>Other Ministry group's presentation series</td>
<td>Presentation</td>
<td>Other specific Ministry Groups, eg, ELSA</td>
</tr>
</tbody>
</table>

Consultation and communication process:

The process for consultation and communication is outlined below.

1. Analysis & Writing (including Q&A, proofreading)
2. Post on EDK Internal Papers confluence page and send to relevant teams for consultation. Revise as needed.
3. Send draft and any other communication documents to manager and GM for review and sign-off. Revise as needed. Use editor or proof-reader as needed, making sure the papers are in consistent style.
4. Send final draft and any other communication documents to Dep Sec for review and sign-off.

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6. Share publication with stakeholders via the channels previously mentioned. Dep Sec sends LT email. Publication included in next EWU.
Current and Future Papers

The papers below are currently drafted and ready to be released:

- Are New Zealand teachers adapting their lessons for student needs, and does it matter?
- Inquiry-based or teacher-directed science? Evidence from PISA
- Reading literacy instruction in English-language countries: similarities and differences
- How often are students being assessed, and for what purposes?
- How much feedback are students receiving from teachers?
- How much 'voice' and 'choice' are students given?
- Ability Grouping in New Zealand
- Making connections in the classroom

The papers below are scheduled to be prepared for the series.

- Teacher knowledge and confidence

Additional papers will be prepared in the future. There may also be updates to the papers as studies release more recent data.
Appendix one: Writing standards

- Write for the audience. Make it easy for them to understand the main findings.
- Plan before you write –
  - What are the most important things to say? This needs to come first
  - What doesn’t the reader need to know – what isn’t vital and can be removed?
  - What is the current context that sits around the evidence you are writing about and how will you connect with this?
  - How might a reader use this information and how can you make it easy for them to do so?
  - Scope out what your key messages and conclusions will be – what are the insights you are presenting?
  - How will you order the information and make a sensible and logical story – if the reader only read the first line of each section – would they have some idea of what was important?
  - How will you use graphs and graphics to best effect? Don’t be limited to bar graphs – if you want to use some simple graphics or photos do so. For approved photos contact visual.identity@education.govt.nz.

- Must adhere to the Ministry Style guide and use the template provided.
- Remember to check the basics:
  - The tone and style is plain English but not journalistic – stay factual and based in evidence. Be clear not to imply causality if you can’t prove it. But don’t be afraid to posit a possible hypothesis or potential connection to help the reader set your work in context. Provide a balanced picture of the findings.
  - Check your language tenses – be careful not to apply present or future tense if the data is past point in time.
  - Ensure graphs have clear titles, keys and axis labels – be careful not to overinflate (or undercook) a finding by having especially large or small scales.
  - Use footnotes and references appropriately.
  - Ensure the correct use of numerals versus written numbers, % v percentage etc (see style guide).
  - Ensure writing is error free – no spelling or grammar mistake
Annex two: Are New Zealand teachers adapting their lessons for student needs, and does it matter?
Teaching in New Zealand: findings from international studies

Are New Zealand teachers adapting their lessons for student needs, and does it matter?

Summary
This paper describes what adaptive teaching looks like in New Zealand using data from international research studies. Examining how often teachers implement adaptive instruction and how confidently they do so shows whether teachers are prepared and willing to use this instructional technique. The paper also explores the relationship between adaptive instruction and student outcomes, such as academic performance and motivation. The findings will be relevant to those seeking a deeper knowledge of the instructional tools teachers are using in today's classrooms.

Key Findings
- There is strong evidence of Year 5 reading teachers adapting their lessons regularly. Nine out of ten reading students have teachers who provide materials appropriate for the reading levels of individual students in every lesson or almost every lesson.
- Year 5 maths and science teachers are less confident in implementing adaptive instruction compared with their international peers. Despite this, students report that adaptive teaching occurs often, with the majority agreeing their teacher does a variety of things to help them learn, similar to the international average.
- A slightly smaller proportion of Year 9 students report that adaptive teaching occurs, but this proportion is also similar to the international average. And secondary teachers report relatively high confidence in implementing adaptive teaching methods compared with international averages. According to 15-year-old students, their science teachers adapt their science lessons more than teachers in most countries.
- For many students, adaptive instruction methods are associated with higher performance, on average, across subjects and year levels. However, for Māori 15-year-old students, adaptive instruction is associated with lower science performance, after accounting for student and school socioeconomic characteristics.
- Adaptive teaching in 15-year-old students' science lessons is also associated with a positive disciplinary climate, supportive teachers, teachers giving students feedback, increased student enjoyment, interest in and epistemic beliefs about science, greater confidence and motivation in science, and an increased sense of belonging.
Background

Adaptive teaching is a practice where teachers are actively evaluating the impact of their lessons and adapting the structure or content of the lesson in a way that leads to optimal learning outcomes for the whole class, based on their students’ knowledge, skills and interests (Borich, 2011; Hattie & Yates, 2013). In this way, teachers take on the role of not only activators of learning, but also evaluators of that activation, and change course accordingly.

Teachers can adapt the lesson in several ways. For instance, when a class is having trouble understanding a lesson, teachers can alter the lesson materials, the structure of the lesson or the way the content is presented. An adaptive teacher is broadly the opposite of a teacher who has identified what has worked for them before and so uses their preferred routine method repeatedly. An adaptive teacher knows that if a student is not learning, the student does not need ‘more’ but rather ‘different’ (Pearson & Hoffman, 2011).

Much research has been done on the importance of adaptive instruction, but evidence from international studies can now describe whether New Zealand teachers are adapting their lessons and how this practice is related to student outcomes in the New Zealand context.

Results

Year 5 science teachers are less confident in adaptive teaching than teachers internationally, and less confident than Year 5 maths teachers as well.

A little over 60% of Year 5 science teachers report being confident¹ in adapting their teaching to engage student interest, compared with over 80% internationally. Only three other countries have teachers who report such low confidence levels. More Year 5 maths teachers report confidence in adapting to student interest and this figure is closer to the international average (84% and 86% respectively).

A mere 35% of Year 5 science teachers report being confident in their ability to provide challenging tasks for high achieving students, much lower than the international average of 59%, and 81% of Year 5 maths teachers. This low confidence may be because Year 5 teachers in New Zealand teach a relatively low number of hours of science per year (43 versus the international average of 76 hours) and thus do not have enough opportunity to develop this skill using science content (Gaya Gill, Singh, & Hanilar, 2016).

Figure 1. Proportion of science teachers responding ‘high’ or ‘very high’ to ‘in teaching science to this class, how would you characterise your confidence in doing the following?’

<table>
<thead>
<tr>
<th></th>
<th>New Zealand</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>...adapting my teaching to engage students’ interests</td>
<td>88%</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>...providing challenging tasks for the highest achieving students</td>
<td>72%</td>
<td>72%</td>
</tr>
<tr>
<td></td>
<td>81%</td>
<td>84%</td>
</tr>
</tbody>
</table>

Source: TIMSS 2014/15 Almanac

¹ Teachers were given the response options of ‘low’, ‘medium’, ‘high’ or ‘very high’. In this paper, teachers are confident if they responded ‘high’ or ‘very High’.
Overall, Year 9 teachers are relatively confident in implementing adaptive teaching methods.

Year 9 teachers’ confidence levels related to adaptive teaching are broadly similar to or slightly below the international and Organisation for Economic Co-operation and Development (OECD) averages, but this varies across subjects and adaptation strategies. Science teachers at this year level were more confident in adapting lessons to student interest (81% compared with 72% of maths teachers), while maths teachers were more confident in providing challenging tasks for higher achieving students (74% compared with 60% of science teachers).

TALIS also asks secondary (Year 7-10) teachers to what extent they can implement adaptive teaching and this data shows they have slightly higher confidence levels than international averages but confidence still varies by strategy. Secondary teachers report they are more confident in providing alternative explanations (96% responding ‘a lot’ or ‘quite a bit’) than in implementing alternative instructional strategies (82%). This suggests teachers may be more comfortable providing small adaptations, such as alternative explanations, than larger changes such as to instructional strategies.

Figure 2. Proportion of Year 7-10 teachers’ responses to ‘In your teaching, to what extent can you do the following?’

<table>
<thead>
<tr>
<th>Category</th>
<th>New Zealand</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implement alternative instructional strategies in my classroom</td>
<td>33</td>
<td>32</td>
</tr>
<tr>
<td>Provide an alternative explanation when students are confused</td>
<td>50</td>
<td>48</td>
</tr>
</tbody>
</table>

Source: TALIS 2013/14 database
Values under 3 are not labeled

One aspect of adaptive teaching is evaluating if students are learning throughout the lesson and the majority of Year 5 reading and maths teachers do this.

Well over half (58%) of students’ reading teachers ask if their students need clarification about what they are reading every day or almost every day and just 5% do this less than weekly. Figure 3 shows the majority of Year 5 reading and maths students have teachers who report they place a major emphasis on assessing students’ ongoing work (71% and 84%) to monitor student progress.

However, a smaller proportion of Year 5 science and Year 9 science and maths teachers report the same, below the international average. When compared with all other countries, New Zealand is one of the five lowest countries for the proportion of students’ Year 5 science and Year 9 maths and science teachers placing a major emphasis on the assessment of student work to monitor progress.
In primary reading there is strong evidence of teachers adapting their lessons often.

Nearly 90% of primary reading students have teachers who provide materials appropriate for the reading levels of individual students in every lesson or almost every lesson, much higher than the international average of 38% (Figure 4). Over 90% of Year 5 reading students also agree (a little or a lot) that their teacher ‘does a variety of things to help me learn’ and ‘tells me how to do something differently when I make a mistake’, similar to the international average (Figure 5). And nearly all (98%) primary reading students report that their teachers change teaching approach and try something different when a student falls behind in reading.
In maths and science classrooms, Year 5 students indicate adaptive teaching occurs often, but less so for Year 9 students.

Ninety percent of Year 5 students agree a lot or a little that their science and maths teachers ‘do a variety of things to help them learn’ and tell them ‘how to do better when they make a mistake’ (similar to the international average). However, by Year 9, students’ agreement with those statements drops to around 80% (Figure 5).

**Figure 5. Proportion of students’ agreement with the statements...**

- **...my teacher does a variety of things to help me learn**
- **...my teacher tells me how to do better when I make a mistake.**

![Graphs showing agreement by New Zealand and International students](source: TIMSS 2014/15 Almanac & PIRLS 2015/16 Almanac)

15-year-olds in New Zealand reported their science teachers adapt their lessons more frequently than the OECD average and most other countries.

In 2015 PISA asked 15-year-old students about their science teacher’s frequency of adapting lessons to students’ needs and providing individual help. The items were combined to create an adaptive teaching index and New Zealand was in the top 10 countries with the highest adaptive teaching index scores. Over half of 15-year-olds reported their teacher adapts lessons to their class’s needs and provides individual help to students in many lessons or almost every lesson. Still, 16% of students reported their teacher never changes the structure of the lesson on a topic that most students find difficult to understand.

**Figure 6. Proportion of 15-year-old students who report their teachers adapting science lessons**

<table>
<thead>
<tr>
<th></th>
<th>New Zealand</th>
<th>OECD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The teacher adapts the lesson to my class’s needs and knowledge</td>
<td>35</td>
<td>29</td>
</tr>
<tr>
<td>The teacher provides individual help when a student has difficulties understanding a topic or task</td>
<td>38</td>
<td>30</td>
</tr>
<tr>
<td>The teacher changes the structure of the lesson on a topic that most students find difficult to understand</td>
<td>31</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: PISA 2015 Results Volume II (OECD, 2016), Table II.2.23
Adaptive teaching is associated with a positive disciplinary climate and teachers who are supportive of and give feedback to their students.

It can be important to look at what conditions enable – or hinder – adaptive teaching practices. Investigating where this practice is occurring more often found that there were no consistent differences in the use of adaptive teaching between disadvantaged and advantaged schools, private and public, or rural and urban schools. One exception was that Year 5 reading teachers provided reading material that matched the interests of students more frequently in disadvantaged schools, possibly as a way for teachers to engage low performers more in reading.

Figure 7 shows that a one-unit increase in the PISA index of disciplinary climate in science lessons is associated with an increase in the index of adaptive teaching in science lessons, and the increase changes very little even after accounting for student and school socioeconomic status and science performance. This suggests that an orderly learning environment is a necessary precondition for teachers to be able to use diverse learning strategies and support individual students. TIMSS Year 9 showed a similar pattern, where students in ‘very safe and orderly schools’, according to their teachers, agreed more that their teachers did a variety of things to help them learn and told them how to do things differently when they made a mistake.

Figure 7 also shows that, among teachers of 15-year-olds, teacher support in science lessons are highly associated with adaptive teaching in that a one-unit increase in the PISA index of adaptive teaching in science lessons is linked to a large increase in both indices. PIRLS data also confirms the relationship with feedback and adaptive teaching in that primary reading teachers who give individual feedback to students also reported more frequently providing reading material that matches student interests and reading levels. Interestingly, adaptive teaching in science lessons is also associated with science classrooms where both inquiry and teacher-directed instruction are occurring, indicating adaptive teaching is compatible with different instructional styles.

**Figure 7. Change in the PISA index of adaptive teaching in science lessons per one-unit increase in the index of disciplinary climate, inquiry-based teaching, teacher-directed instruction, perceived feedback and teacher support.**

<table>
<thead>
<tr>
<th>Disciplinary climate</th>
<th>Inquiry-based teaching</th>
<th>Teacher-directed science instruction</th>
<th>Perceived feedback</th>
<th>Teacher support</th>
</tr>
</thead>
<tbody>
<tr>
<td>After accounting for student and school socioeconomic status and science performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before accounting for student and school socioeconomic status and science performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: PISA 2016 database

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2 Schools in the bottom quarter of the PISA Index of economic, social, and cultural status (ESCS) are classified as disadvantaged and schools in the top quarter of ESCS are classified as advantaged.

3 Poor disciplinary climate was measured using student-reported responses to questions on students not listening to the teacher, noise and disorder, and students being unable to work in class.

4 Teacher support in science lessons was measured using student-reported responses to questions on a teacher’s interest in every student learning, giving extra help, and continuing to teach until students understand.

5 Perceived feedback in science lessons was measured using student-reported responses to questions on the teacher telling students how they are performing, what their strengths are, how they can improve, and how they can reach learning goals.
For many students, adaptive instruction methods are associated with higher performance, on average, across subjects and year levels.

In PISA, a one-unit increase in the index of adaptive teaching in science lessons amounts to a 10-point increase in science score, and a 7-point increase in science score after accounting for school and student characteristics (Figure 8), which is equivalent to a difference in performance of about one school term. However, in the individual statements PISA asks about adaptive teaching, no relationship was found between science performance and teachers who ‘change the structure of the lesson on a topic that most students find difficult to understand’ (Figure 8).

**Figure 8.** Relationship between PISA science scores and adaptive teaching

Change in PISA science performance associated with a one-unit increase in the index of adaptive teaching in science lessons

PISA science score of students by response to adaptive teaching practices

Source: PISA 2015 Results Volume II (OECD, 2016), Table II.2.24 and PISA 2015 database

Curiously, the association between higher science performance and adaptive teaching did not hold true for all students. For Māori and Asian students, a one-unit increase in the adaptive teaching index resulted in no significant change in students’ PISA science score, and for Māori there was a decrease in science score after accounting for student and school socioeconomic status and the school’s disciplinary climate. This suggests that lower performing Māori students are more exposed to adaptive teaching. Conversely, for Pākehā and Pacific students, higher performing students are more exposed to adaptive teaching, after accounting for student and school socioeconomic status and the school’s disciplinary climate.
TIMSS and PIRLS show a similar positive association between adaptive teaching and performance. Students who agreed their teacher does a variety of things to help them learn and tells them how to do something differently if they make a mistake scored higher than those who disagreed, even after accounting for school decile (Figure 9). The only exception is for Year 5 maths and science students: there was no difference for students who agreed their teachers do something differently if they make a mistake.

**Figure 9.** Change in the reading, maths and science scores for students who agreed or strongly agreed with the adaptive teaching statements 'My teacher...'.

Source: TIMSS 2014/15 and PIRLS 2015/16 database

In addition to a general increase in science performance, according to PISA data, adaptive teaching is also associated with many advantageous student mindsets.

Figure 10 shows that a one-unit increase in the PISA index of adaptive teaching is linked to higher student motivation, enjoyment of science, epistemic beliefs, interest in broad science topics, sense of belonging and self-efficacy. All increases are statistically significant, even after accounting for student and school characteristics.

**Figure 10.** Change in the index of mindsets associated with a one-unit increase on the index of adaptive teaching in science lessons

Source: PISA 2015 database

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6 Changes in scores that are statistically significant are dark blue and dark grey; changes that are not statistically significant are light blue and light grey.
Conclusion

Near the end of his career, educational psychologist Richard Snow (1997) concluded:

Students differ from one another in dozens of important ways that reflect cultural as well as individual characteristics. Minute by minute and month by month, we must decide when and how to adapt to the characteristics of particular students, when and how not to do so, and which student characteristics to attend to in either case... When done well, it is an awesome balancing act. (p. 355)

This balancing act – adaptive teaching – is associated with many positive benefits for many students: increased science performance, greater interest and enjoyment of the subject, greater confidence and motivation and even a greater sense of belonging at school generally. And so it is important for teachers to consider how often they are adapting lessons to students’ needs and interests, monitoring student understanding throughout a lesson, and pivoting when students aren’t progressing.

It has been shown that many New Zealand students agree their teachers adapt their instruction, and the results are similar to, or better than, other countries. This indicates that the practice is embedded in most classrooms. However, it was shown that not all students were exposed to the same amounts of adaptive instruction. Low performing Māori and Asian students and high performing Pacific and Pākehā students experience adaptive instruction the most. Thus there is a need and opportunity for adaptive instruction to be universal in all classrooms for all students of all backgrounds and abilities.

An emerging theme that came out of the Education Conversation online survey was the need for more learning support and a more inclusive education for students with additional needs’. The Tomorrow’s Schools Review report also concluded that students with learning support requirements do not have the same access to schooling as other students. Having teachers trained and confident in adaptive instruction for all students, especially for Year 5 science teachers where confidence is lowest, would help achieve the goal of a more inclusive education system.

Reflection questions for teachers and those who support teachers

- How often are formative assessments used during lessons to monitor student progress?
- Are common misunderstandings identified in advance with alternate ways to teach or demonstrate the key concepts?
- How often are students’ interests used to adapt lesson materials?
- How can technology be used so that all students can access key concepts and tasks?
- Are students given multiple opportunities and ways to access and practice key concepts and tasks?

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Research methods and data sources
This paper synthesises assessment and questionnaire data from four international studies.

TIMSS 2014/15 assessed the maths and science abilities of Year 5 and Year 9 students. PIRLS 2015/16 assessed Year 5 students’ reading literacy. Background information was collected from students, teachers and schools. Both of these studies were conducted by the International Association for the Evaluation of Educational Achievement’s (IEA’s) TIMSS & PIRLS International Study Center.

PISA 2015 assessed students aged 15 years in mathematics, science and reading, with a main focus on science. Background information was collected from the student and their school. TALIS focuses on teachers and principals of Year 7-10 students. Information was collected on teachers’ working conditions, attitudes about teaching, and teaching practices. Both of these studies were conducted by the Organisation for Economic Co-operation and Development (OECD).

Since the studies focus on different year levels and subjects, and are conducted by two different research organisations, the questionnaire items are different across studies. PISA developed their questionnaire with the intention of measuring adaptive instruction using an index, while the other studies did not develop their questionnaire with this in mind.

Authored by Emma Medina

For further data and information on the international studies, please visit https://www.educationcounts.govt.nz/topics/research.

For further information, questions or discussion around additional analysis and potential topics please contact Requests.EDK@education.govt.nz
References


We shape an education system that delivers equitable and excellent outcomes

He mea tārai e mātou te mātauranga kia rangatira ai, kia mana taurite ai ōna huanga
Annex three: Communications Plan
Communications Plan

Release of EDK series ‘Teaching in New Zealand: findings from international studies’

Wednesday, 5 June 2019

Background and strategic context

The Educational Measurement and Assessment (EMA) team in EDK operates four international research studies in order to monitor the performance of the NZ education system as well as collect contextual information from student, teachers, parents and principals.

- Progress in International Reading Literacy Study (PIRLS)
- Trends in International Maths and Science Study (TIMSS)
- Programme for International Student Assessment (PISA)
- Teaching and Learning International Survey (TALIS)

Grounded in the premise of the importance of teachers, EDK has developed a series of papers that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers. The eight papers describe how often teachers implement various teaching practices such as adaptive instruction, ability grouping, assessment, and feedback (based on teacher and student responses to questionnaires).

Communications objectives

The purpose of the series is to provide objective reports which will support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy. To that end, the primary objective of the communications plan is to make key stakeholders aware of the series.

Key messages

- Teachers are one of the most important levers for student learning. Hattie (2003) estimates that teachers account for roughly 30% of variance in student achievement.

- Because teachers are so important, a series of papers have been developed using international research data to describe how often teachers implement various teaching practices relative to our international peers. Relationships between instructional practices and academic and non-academic outcomes are also explored.

- By painting a picture of what different instruction practices look like in New Zealand, the goal of the series is to support and inform sector support, the teaching profession, and the policy work of the Ministry.
**Communications issues and concerns**

Identify any communications issues or concerns. What is the likelihood of this occurring? How much impact would this have if it occurred? What is being done to address these concerns?

<table>
<thead>
<tr>
<th>Communication issues, concerns</th>
<th>Likelihood (high, moderate, low)</th>
<th>Impact (high, moderate, low)</th>
<th>Mitigation (what is being done or will be done to address the concerns)</th>
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</thead>
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<tr>
<td>A risk is that readers and/or media may focus on the comparisons made between New Zealand teachers and their international peers, especially if it is not favourable.</td>
<td>Low</td>
<td>Moderate</td>
<td>The papers are objective reports of data collection from teacher and student questionnaires without speculation, interpretation or judgment.</td>
</tr>
</tbody>
</table>

**Communications activities**

Identifies - Audiences, What they need to know: channels, products, when, and who responsible.

<table>
<thead>
<tr>
<th>Product or activity</th>
<th>Audience (who needs to know?)</th>
<th>Objective/ What do they need to know?</th>
<th>Channel</th>
<th>Due Date/ When</th>
<th>Who responsible</th>
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<td>The release and where to find the papers</td>
<td>Education Counts</td>
<td>19 July</td>
<td>EMA / Emma Medina</td>
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<td>School leaders</td>
<td>The release and where to find the papers</td>
<td>Bulletin</td>
<td>29 July</td>
<td>Emma Medina</td>
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<td>The release and where to find the papers</td>
<td>Te Kete Ipurangi</td>
<td>29 July</td>
<td>Emma Medina</td>
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<td>Sector</td>
<td>The release and where to find the papers</td>
<td>Education Gazette</td>
<td>TBD</td>
<td>Emma Medina</td>
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<td>PowerPoint presentation</td>
<td>Ministry</td>
<td>The main findings</td>
<td>EDK learning bites/Te Hiko presentations</td>
<td>TBD</td>
<td>EMA / Emma Medina</td>
</tr>
<tr>
<td>Email to peak bodies</td>
<td>Sector</td>
<td>The release and where to find the papers</td>
<td>Email</td>
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**Sign off process**

The tentative release date is 19 July.

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<tr>
<th>Signoff</th>
<th>Who</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author – business unit and/or comms</td>
<td>Emma</td>
<td>6 June</td>
</tr>
<tr>
<td>Read by/input provided (business owners and impacted business units)</td>
<td>ELSA</td>
<td>25 June</td>
</tr>
<tr>
<td>Approver/role/business unit</td>
<td>Philip</td>
<td>3 July</td>
</tr>
<tr>
<td>Final sign off - responsible Dep Sec(s)</td>
<td>Craig Jones</td>
<td>4 July</td>
</tr>
</tbody>
</table>
Teaching in New Zealand: findings from international studies

Are New Zealand teachers adapting their lessons for student needs, and does it matter?

Summary
This paper describes what adaptive teaching looks like in New Zealand using data from international research studies. Examining how often teachers implement adaptive instruction and how confidently they do so shows whether teachers are prepared and willing to use this instructional technique. The paper also explores the relationship between adaptive instruction and student outcomes, such as academic performance and motivation. The findings will be relevant to those seeking a deeper knowledge of the instructional tools teachers are using in today’s classrooms.

Key Findings
- There is strong evidence of Year 5 reading teachers adapting their lessons regularly. Nine out of ten reading students have teachers who provide materials appropriate for the reading levels of individual students in every lesson or almost every lesson.
- Year 5 maths and science teachers are less confident in implementing adaptive instruction compared with their international peers. Despite this, students report that adaptive teaching occurs often, with the majority agreeing their teacher does a variety of things to help them learn, similar to the international average.
- A slightly smaller proportion of Year 9 students report that adaptive teaching occurs, but this proportion is also similar to the international average. And secondary teachers report relatively high confidence in implementing adaptive teaching methods compared with international averages. According to 15-year-old students, their science teachers adapt their science lessons more than teachers in most countries.
- For many students, adaptive instruction methods are associated with higher performance, on average, across subjects and year levels. However, for Māori 15-year-old students, adaptive instruction is associated with lower science performance, after accounting for student and school socioeconomic characteristics.
- Adaptive teaching in 15-year-old students’ science lessons is also associated with a positive disciplinary climate, supportive teachers, teachers giving students feedback, increased student enjoyment, interest in and epistemic beliefs about science, greater confidence and motivation in science, and an increased sense of belonging.
Background

Adaptive teaching is a practice where teachers are actively evaluating the impact of their lessons and adapting the structure or content of the lesson in a way that leads to optimal learning outcomes for the whole class, based on their students’ knowledge, skills and interests (Borich, 2011; Hattie & Yates, 2013). In this way, teachers take on the role of not only activators of learning, but also evaluators of that activation, and change course accordingly.

Teachers can adapt the lesson in several ways. For instance, when a class is having trouble understanding a lesson, teachers can alter the lesson materials, the structure of the lesson or the way the content is presented. An adaptive teacher is broadly the opposite of a teacher who has identified what has worked for them before and so uses their preferred routine method repeatedly. An adaptive teacher knows that if a student is not learning, the student does not need ‘more’ but rather ‘different’ (Pearson & Hoffman, 2011).

Much research has been done on the importance of adaptive instruction, but evidence from international studies can now describe whether New Zealand teachers are adapting their lessons and how this practice is related to student outcomes in the New Zealand context.

Results

Year 5 science teachers are less confident in adaptive teaching than teachers internationally, and less confident than Year 5 maths teachers as well.

A little over 60% of Year 5 science teachers report being confident \(^1\) in adapting their teaching to engage student interest, compared with over 80% internationally. Only three other countries have teachers who report such low confidence levels. More Year 5 maths teachers report confidence in adapting to student interest and this figure is closer to the international average (84% and 86% respectively).

A mere 35% of Year 5 science teachers report being confident in their ability to provide challenging tasks for high achieving students, much lower than the international average of 59%, and 81% of Year 5 maths teachers. This low confidence may be because Year 5 teachers in New Zealand teach a relatively low number of hours of science per year (43 versus the international average of 76 hours) and thus do not have enough opportunity to develop this skill using science content (Caygill, Singh, & Hanlar, 2016).

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\(^1\) Teachers were given the response options of ‘low’, ‘medium’, ‘high’ or ‘very high’. In this paper, teachers are confident if they responded ‘high’ or ‘very high’. 

Source: TIMSS 2014/15 Almanacs

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Figure 1. Proportion of science teachers responding ‘high’ or ‘very high’ to ‘In teaching science to this class, how would you characterise your confidence in doing the following?’

...adapting my teaching to engage students' interests

...providing challenging tasks for the highest achieving students

New Zealand | International

<table>
<thead>
<tr>
<th>Year 5 Science</th>
<th>Year 9 Science</th>
<th>Year 5 Maths</th>
<th>Year 9 Maths</th>
</tr>
</thead>
<tbody>
<tr>
<td>84%</td>
<td>86%</td>
<td>63%</td>
<td>72%</td>
</tr>
<tr>
<td>72%</td>
<td>81%</td>
<td>82%</td>
<td>84%</td>
</tr>
<tr>
<td>81%</td>
<td>77%</td>
<td>35%</td>
<td>59%</td>
</tr>
<tr>
<td>74%</td>
<td>72%</td>
<td>60%</td>
<td>68%</td>
</tr>
</tbody>
</table>

Source: TIMSS 2014/15 Almanacs
Overall, Year 9 teachers are relatively confident in implementing adaptive teaching methods.

Year 9 teachers’ confidence levels related to adaptive teaching are broadly similar to or slightly below the international and Organisation for Economic Co-operation and Development (OECD) averages, but this varies across subjects and adaptation strategies. Science teachers at this year level were more confident in adapting lessons to student interest (81% compared with 72% of maths teachers), while maths teachers were more confident in providing challenging tasks for higher achieving students (74% compared with 60% of science teachers).

TALIS also asks secondary (Year 7-10) teachers to what extent they can implement adaptive teaching and this data shows they have slightly higher confidence levels than international averages but confidence still varies by strategy. Secondary teachers report they are more confident in providing alternative explanations (96% responding ‘a lot’ or ‘quite a bit’) than in implementing alternative instructional strategies (82%). This suggests teachers may be more comfortable providing small adaptations, such as alternative explanations, than larger changes, such as to instructional strategies.

One aspect of adaptive teaching is evaluating if students are learning throughout the lesson and the majority of Year 5 reading and maths teachers do this.

Well over half (58%) of students’ reading teachers ask if their students need clarification about what they are reading every day or almost every day and just 5% do this less than weekly. Figure 3 shows the majority of Year 5 reading and maths students have teachers who report they place a major emphasis on assessing students’ ongoing work (71% and 84%) to monitor student progress.

However, a smaller proportion of Year 5 science and Year 9 science and maths teachers report the same, below the international average. When compared with all other countries, New Zealand is one of the five lowest countries for the proportion of students’ Year 5 science and Year 9 maths and science teachers placing a major emphasis on the assessment of student work to monitor progress.
In primary reading there is strong evidence of teachers adapting their lessons often.

Nearly 90% of primary reading students have teachers who provide materials appropriate for the reading levels of individual students in every lesson or almost every lesson, much higher than the international average of 38% (Figure 4). Over 90% of Year 5 reading students also agree (a little or a lot) that their teacher ‘does a variety of things to help me learn’ and ‘tells me how to do something differently when I make a mistake’, similar to the international average (Figure 5). And nearly all (98%) primary reading students report that their teachers change teaching approach and try something different when a student falls behind in reading.

Figure 3. Proportion of students’ teachers who place a major emphasis on the assessment of students’ ongoing work to monitor student progress

Source: TIMSS 2014/15 Almanacs & PIRLS 2015/16 Almanac

Figure 4. Proportion of Year 5 students’ reading teachers who provide materials that match the reading levels and interests of their students

Source: PIRLS 2015/16 Almanac

Values under 3 are not labelled
In maths and science classrooms, Year 5 students indicate adaptive teaching occurs often, but less so for Year 9 students.

Ninety percent of Year 5 students agree a lot or a little that their science and maths teachers 'do a variety of things to help them learn' and tell them ‘how to do better when they make a mistake’ (similar to the international average). However, by Year 9, students’ agreement with those statements drops to around 80% (Figure 5).

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Figure 6. Proportion of 15-year-old students who report their teachers adapting science lessons

The teacher adapts the lesson to my class’s needs and knowledge

The teacher provides individual help when a student has difficulties understanding a topic or task

The teacher changes the structure of the lesson on a topic that most students find difficult to understand

Source: PISA 2015 Results Volume II (OECD, 2016), Table II.23
Adaptive teaching is associated with a positive disciplinary climate and teachers who are supportive of and give feedback to their students.

It can be important to look at what conditions enable – or hinder – adaptive teaching practices. Investigating where this practice is occurring more often found that there were no consistent differences in the use of adaptive teaching between disadvantaged and advantaged schools, private and public, or rural and urban schools. One exception was that Year 5 reading teachers provided reading material that matched the interests of students more frequently in disadvantaged schools, possibly as a way for teachers to engage low performers more in reading.

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For many students, adaptive instruction methods are associated with higher performance, on average, across subjects and year levels.

In PISA, a one-unit increase in the index of adaptive teaching in science lessons amounts to a 10-point increase in science score, and a 7-point increase in science score after accounting for school and student characteristics (Figure 8), which is equivalent to a difference in performance of about one school term. However, in the individual statements PISA asks about adaptive teaching, no relationship was found between science performance and teachers who ‘change the structure of the lesson on a topic that most students find difficult to understand’ (Figure 8).

Curiously, the association between higher science performance and adaptive teaching did not hold true for all students. For Māori and Asian students, a one-unit increase in the adaptive teaching index resulted in no significant change in students’ PISA science score, and for Māori there was a decrease in science score after accounting for student and school socioeconomic status and the school’s disciplinary climate. This suggests that lower performing Māori students are more exposed to adaptive teaching. Conversely, for Pākehā and Pacific students, higher performing students are more exposed to adaptive teaching, after accounting for student and school socioeconomic status and the school’s disciplinary climate.
TIMSS and PIRLS show a similar positive association between adaptive teaching and performance. Students who agreed their teacher does a variety of things to help them learn and tells them how to do something differently if they make a mistake scored higher than those who disagreed, even after accounting for school decile (Figure 9). The only exception is for Year 5 maths and science students: there was no difference for students who agreed their teachers do something differently if they make a mistake.

Figure 9. Change in the reading, maths and science scores for students who agreed or strongly agreed with the adaptive teaching statements ‘My teacher...’

Source: TIMSS 2014/15 and PIRLS 2015/16 database

In addition to a general increase in science performance, according to PISA data, adaptive teaching is also associated with many advantageous student mindsets.

Figure 10 shows that a one-unit increase in the PISA index of adaptive teaching is linked to higher student motivation, enjoyment of science, epistemic beliefs, interest in broad science topics, sense of belonging and self-efficacy. All increases are statistically significant, even after accounting for student and school characteristics.

Figure 10. Change in the index of mindsets associated with a one-unit increase on the index of adaptive teaching in science lessons

Source: PISA 2015 database

Changes in scores that are statistically significant are dark blue and dark grey; changes that are not statistically significant are light blue and light grey.
Conclusion

Near the end of his career, educational psychologist Richard Snow (1997) concluded:

Students differ from one another in dozens of important ways that reflect cultural as well as individual characteristics. Minute by minute and month by month, we must decide when and how to adapt to the characteristics of particular students, when and how not to do so, and which student characteristics to attend to in either case… When done well, it is an awesome balancing act. (p. 355)

This balancing act – adaptive teaching – is associated with many positive benefits for many students: increased science performance, greater interest and enjoyment of the subject, greater confidence and motivation and even a greater sense of belonging at school generally. And so it is important for teachers to consider how often they are adapting lessons to students’ needs and interests, monitoring student understanding throughout a lesson, and pivoting when students aren’t progressing.

It has been shown that many New Zealand students agree their teachers adapt their instruction, and the results are similar to, or better than, other countries. This indicates that the practice is embedded in most classrooms. However, it was shown that not all students were exposed to the same amounts of adaptive instruction. Low performing Māori and Asian students and high performing Pacific and Pākehā students experience adaptive instruction the most. Thus there is a need and opportunity for adaptive instruction to be universal in all classrooms for all students of all backgrounds and abilities.

An emerging theme that came out of the Education Conversation online survey was the need for more learning support and a more inclusive education for students with additional needs. The Tomorrow’s Schools Review report also concluded that students with learning support requirements do not have the same access to schooling as other students. Having teachers trained and confident in adaptive instruction for all students, especially for Year 5 science teachers where confidence is lowest, would help achieve the goal of a more inclusive education system.

Reflection questions for teachers and those who support teachers

- How often are formative assessments used during lessons to monitor student progress?
- Are common misunderstandings identified in advanced with alternate ways to teach or demonstrate the key concepts?
- How often are students’ interests used to adapt lesson materials?
- How can technology be used so that all students can access key concepts and tasks?
- Are students given multiple opportunities and ways to access and practice key concepts and tasks?

Research methods and data sources

This paper synthesises assessment and questionnaire data from four international studies.

TIMSS 2014/15 assessed the maths and science abilities of Year 5 and Year 9 students. PIRLS 2015/16 assessed Year 5 students’ reading literacy. Background information was collected from students, teachers and schools. Both of these studies were conducted by the International Association for the Evaluation of Educational Achievement’s (IEA’s) TIMSS & PIRLS International Study Center.

PISA 2015 assessed students aged 15 years in mathematics, science and reading, with a main focus on science. Background information was collected from the student and their school. TALIS focuses on teachers and principals of Year 7-10 students. Information was collected on teachers’ working conditions, attitudes about teaching, and teaching practices. Both of these studies were conducted by the Organisation for Economic Co-operation and Development (OECD).

Since the studies focus on different year levels and subjects, and are conducted by two different research organisations, the questionnaire items are different across studies. PISA developed their questionnaire with the intention of measuring adaptive instruction using an index, while the other studies did not develop their questionnaire with this in mind.

Authored by Emma Medina

For further data and information on the international studies, please visit https://www.educationcounts.govt.nz/topics/research.

For further information, questions or discussion around additional analysis and potential topics please contact Requests.EDK@education.govt.nz
References


We shape an education system that delivers equitable and excellent outcomes

He mea tārai e mātou te mātauranga kia rangatira ai, kia mana taurite ai āna huanga
Communications Plan

Release of EDK series ‘Teaching in New Zealand: findings from international studies’

Wednesday, 5 June 2019

Background and strategic context

The Educational Measurement and Assessment (EMA) team in EDK operates four international research studies in order to monitor the performance of the NZ education system as well as collect contextual information from student, teachers, parents and principals.

- Progress in International Reading Literacy Study (PIRLS)
- Trends in International Maths and Science Study (TIMSS)
- Programme for International Student Assessment (PISA)
- Teaching and Learning International Survey (TALIS)

Grounded in the premise of the importance of teachers, EDK has developed a series of papers that synthesises international research data to paint a picture of what different instructional practices look like in New Zealand compared to our international peers. The eight papers describe how often teachers implement various teaching practices such as adaptive instruction, ability grouping, assessment, and feedback (based on teacher and student responses to questionnaires).

Communications objectives

The purpose of the series is to provide objective reports which will support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy. To that end, the primary objective of the communications plan is to make key stakeholders aware of the series.

Key messages

- Teachers are one of the most important levers for student learning. Hattie (2003) estimates that teachers account for roughly 30% of variance in student achievement.

- Because teachers are so important, a series of papers have been developed using international research data to describe how often teachers implement various teaching practices relative to our international peers. Relationships between instructional practices and academic and non-academic outcomes are also explored.

- By painting a picture of what different instruction practices look like in New Zealand, the goal of the series is to support and inform sector support, the teaching profession, and the policy work of the Ministry.
Communications issues and concerns
Identify any communications issues or concerns. What is the likelihood of this occurring? How much impact would this have if it occurred? What is being done to address these concerns?

<table>
<thead>
<tr>
<th>Communication issues, concerns</th>
<th>Likelihood (high, moderate, low)</th>
<th>Impact (high, moderate, low)</th>
<th>Mitigation (what is being done or will be done to address the concerns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A risk is that readers and/or media may focus on the comparisons made between New Zealand teachers and their international peers, especially if it is not favourable.</td>
<td>Low</td>
<td>Moderate</td>
<td>The papers are objective reports of data collection from teacher and student questionnaires without speculation, interpretation or judgement.</td>
</tr>
</tbody>
</table>

Communications activities
Identifies - Audiences, What they need to know: channels, products, when, and who responsible.

<table>
<thead>
<tr>
<th>Product or activity</th>
<th>Audience (who needs to know?)</th>
<th>Objective/ What do they need to know?</th>
<th>Channel</th>
<th>Due Date/ When</th>
<th>Who responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papers</td>
<td>Sector, media, parents, Ministry</td>
<td>The release and where to find the papers</td>
<td>Education Counts</td>
<td>19 July</td>
<td>EMA / Emma Medina</td>
</tr>
<tr>
<td>Summary and blurb</td>
<td>School leaders</td>
<td>The release and where to find the papers</td>
<td>Bulletin</td>
<td>29 July</td>
<td>Emma Medina</td>
</tr>
<tr>
<td>Summary and blurb</td>
<td>Schooling</td>
<td>The release and where to find the papers</td>
<td>Te Kete Ipurangi</td>
<td>29 July</td>
<td>Emma Medina</td>
</tr>
<tr>
<td>Summary article and link</td>
<td>Sector</td>
<td>The release and where to find the papers</td>
<td>Education Gazette</td>
<td>TBD</td>
<td>Emma Medina</td>
</tr>
<tr>
<td>PowerPoint presentation</td>
<td>Ministry</td>
<td>The main findings</td>
<td>EDK learning bites/Te Hiko presentations</td>
<td>TBD</td>
<td>EMA / Emma Medina</td>
</tr>
<tr>
<td>Email to peak bodies</td>
<td>Sector</td>
<td>The release and where to find the papers</td>
<td>Email</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>
Sign off process

The tentative release date is 19 July.

<table>
<thead>
<tr>
<th>Signoff</th>
<th>Who</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author – business unit and/or comms</td>
<td>Emma</td>
<td>6 June</td>
</tr>
<tr>
<td>Read by/input provided (business owners and impacted business units)</td>
<td>ELSA</td>
<td>25 June</td>
</tr>
<tr>
<td>Approver/role/business unit</td>
<td>Philip</td>
<td>3 July</td>
</tr>
<tr>
<td>Final sign off - responsible Dep Sec(s)</td>
<td>Craig Jones</td>
<td>4 July</td>
</tr>
</tbody>
</table>
Teaching In New Zealand: findings from international studies

Education Insights

Product scope

Version June 2019
Overview

The New Zealand Curriculum (2007) and Te Marautanga o Aotearoa (2008) are designed to guide teaching and learning in New Zealand (in English-medium and Māori-medium respectively). These curricula are not prescriptive but rather give much leeway to teachers and kaiako in how they teach and what they teach.

Hattie (2009), after analysing over 800 studies concludes that “Teachers are among the most powerful influences in learning”. He estimates that below students, teachers are the second major source of variance in student achievement, contributing approximately 30%. While attributes of the students, the school, and the system are all important, what the teacher does, both inside and outside the classroom, matter.

Alton-Lee (2003) identified ten characteristics of quality teaching. These characteristics are interdependent and include the teacher’s orientation to learning, their pedagogical practices, and their planning and collaborative behaviours. How these characteristics apply in practice is, however, are “dependent on the curriculum area, and the experience, prior knowledge and needs of the learners in any particular context”.

This series synthesises international research data to paint a picture of how these quality teaching characteristics play out in practice in New Zealand. The papers generally follow the pattern of describing how frequently New Zealand teachers implement the instructional practice of interest compared with our international peers. The papers also explore what, if any, relationships exist between the teaching practice and student outcomes. They end with reflection questions for the sector.

What are the aims and vision of the series?

<table>
<thead>
<tr>
<th>Vision</th>
<th>The series delivers a concise and objective synthesis of teaching practices in New Zealand which will support the teaching profession, prompt teachers to reflect upon their practices, and inform sector support and Ministry policy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aims</td>
<td>Each paper should be understandable by a wide professional audience, who may be well versed in education issues but not highly data savvy.</td>
</tr>
<tr>
<td>The series is easily accessible</td>
<td>The series synthesises and integrates evidence across international studies.</td>
</tr>
<tr>
<td>The series synthesises and integrates evidence across international</td>
<td>Analysis is error free, quality assured and any caveats are simply and clearly explained. It is easy to read and well written.</td>
</tr>
<tr>
<td>studies</td>
<td>The series is high quality</td>
</tr>
<tr>
<td>The series is influential and impactful</td>
<td>The series is influential and impactful</td>
</tr>
<tr>
<td></td>
<td>Topics are useful to policy developers, school leaders, teachers and teacher educators. They highlight and indicate where further research or analysis may be helpful.</td>
</tr>
</tbody>
</table>

We shape an education system that delivers equitable and excellent outcomes
He mea tārae e mātou te mātauranga kia rangatira ai, kia mana tauite ai āna huanga
How will we know we are getting there?

To help measure if the papers are achieving the aims of the series, we will monitor hits/download data and citation reviews. From time to time we will ask principals and teachers whether they are reading them and seek feedback on how they can be improved.

How will we disseminate and communicate the series?

The Teaching in New Zealand series will be posted on Education Counts. Presentations for Ministry staff will be scheduled, with the potential for presentations to teachers and school leaders to occur in the future.

<table>
<thead>
<tr>
<th>Channel</th>
<th>Vehicle</th>
<th>Product</th>
<th>Audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry Websites</td>
<td>1. Education Counts</td>
<td>Short summary of specific paper and seek feedback</td>
<td>Cross Sector and Public</td>
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<tr>
<td></td>
<td></td>
<td>on the series</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Te Tāhuhu</td>
<td>Page advertising the specific paper</td>
<td>Ministry</td>
</tr>
<tr>
<td></td>
<td>3. Te Kete Ipurangi</td>
<td>Short summary blurb</td>
<td>Schooling</td>
</tr>
<tr>
<td>Ministry Publications</td>
<td>4. Education Gazette</td>
<td>Summary article and link</td>
<td>Cross sector</td>
</tr>
<tr>
<td></td>
<td>5. School Leaders Bulletin</td>
<td>Summary article and link</td>
<td>School leaders</td>
</tr>
<tr>
<td>Webinars</td>
<td>6. Author-Hosted Webinar</td>
<td>Webinar</td>
<td>Cross sector</td>
</tr>
<tr>
<td>Presentations</td>
<td>7. Knowledge Seminar</td>
<td>Presentation</td>
<td>Ministry and Education Agencies</td>
</tr>
<tr>
<td></td>
<td>8. EDK learning Bites/Te Hiko</td>
<td>Presentation</td>
<td>Ministry (mainly EDK)</td>
</tr>
<tr>
<td></td>
<td>9. Key stakeholder presentation</td>
<td>Presentation</td>
<td>Ministry and Education Agencies</td>
</tr>
<tr>
<td></td>
<td>10. Other Ministry group’s presentation series</td>
<td>Presentation</td>
<td>Other specific Ministry Groups, eg, ELSA</td>
</tr>
</tbody>
</table>

Consultation and communication process:
The process for consultation and communication is outlined below.

1. Analysis & Writing (including Q&A, proofreading)
2. Post on EDK Internal Papers confluence page and send to relevant teams for consultation. Revise as needed.
3. Send draft and any other communication documents to manager and GM for review and sign-off. Revise as needed. Use editor or proof-reader as needed, making sure the papers are in consistent style.
4. Send final draft and any other communication documents to Dep Sec for review and sign-off.

6. Share publication with stakeholders via the channels previously mentioned. Dep Sec sends LT email. Publication included in next EWU.
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Current and Future Papers
The papers below are currently drafted and ready to be released:
- Are New Zealand teachers adapting their lessons for student needs, and does it matter?
- Inquiry-based or teacher-directed science? Evidence from PISA
- Reading literacy instruction in English-language countries: similarities and differences
- How often are students being assessed, and for what purposes?
- How much feedback are students receiving from teachers?
- How much 'voice' and 'choice' are students given?
- Ability Grouping in New Zealand
- Making connections in the classroom

The papers below are scheduled to be prepared for the series.
- Teacher knowledge and confidence

Additional papers will be prepared in the future. There may also be updates to the papers as studies release more recent data.
Appendix one: Writing standards

- Write for the audience. Make it easy for them to understand the main findings.

- Plan before you write –
  
  o What are the most important things to say? This needs to come first
  o What doesn’t the reader need to know – what isn’t vital and can be removed?
  o What is the current context that sits around the evidence you are writing about and how will you connect with this?
  o How might a reader use this information and how can you make it easy for them to do so?
  o Scope out what your key messages and conclusions will be – what are the insights you are presenting?
  o How will you order the information and make a sensible and logical story – if the reader only read the first line of each section – would they have some idea of what was important?
  o How will you use graphs and graphics to best effect? Don’t be limited to bar graphs – if you want to use some simple graphics or photos do so. For approved photos contact visual.identity@education.govt.nz.

- Must adhere to the Ministry Style guide and use the template provided.

- Remember to check the basics:
  
  o The tone and style is plain English but not journalistic – stay factual and based in evidence. Be clear not to imply causality if you can’t prove it. But don’t be afraid to posit a possible hypothesis or potential connection to help the reader set your work in context. Provide a balanced picture of the findings.
  o Check your language tenses – be careful not to apply present or future tense if the data is past point in time.
  o Ensure graphs have clear titles, keys and axis labels – be careful not to overinflate (or undercook) a finding by having especially large or small scales.
  o Use footnotes and references appropriately.
  o Ensure the correct use of numerals versus written numbers, % v percentage etc (see style guide).
  o Ensure writing is error free – no spelling or grammar mistake