Teaching as Inquiry: Responding to Learners

July 2012
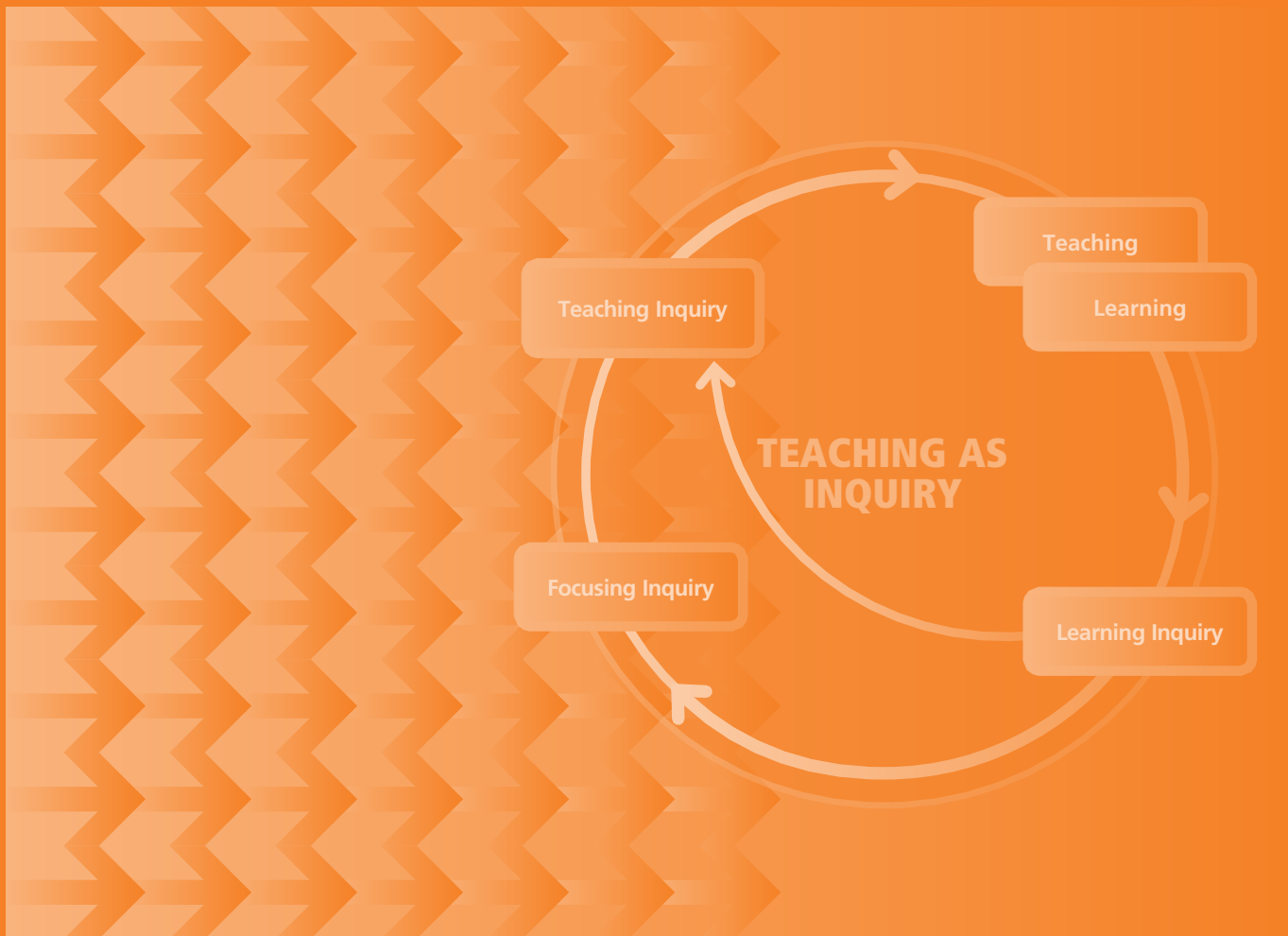
Teaching Inquiry

Teaching

Learning

TEACHING AS INQUIRY

Focusing Inquiry

Learning Inquiry

Ko te Tamaiti te Pūtake o te Kaupapa

The Child – the Heart of the Matter

Foreword

The Education Review Office (ERO) is an independent government department that reviews the performance of New Zealand's schools and early childhood services, and reports publicly on what it finds.

The whakataukī of ERO demonstrates the importance we place on the educational achievement of our children and young people:

Ko te Tamaiti te Pūtake o te Kaupapa
The Child – the Heart of the Matter

In our daily work we have the privilege of going into early childhood services and schools, giving us a current picture of what is happening throughout the country. We collate and analyse this information so that it can be used to benefit the education sector and, therefore, the children in our education system. ERO's reports contribute sound information for work undertaken to support the Government's policies.

This is ERO's second national evaluation report on the extent to which schools have processes in place to support teaching as inquiry. It also looks at the specific inquiry approaches teachers use in classrooms. The evaluation found that, since the earlier report in 2011, there had been a drop in the extent to which schools' systems guided and supported teachers to inquire into their practice. There was also a fall in the extent to which teachers were inquiring into the impact of their teaching on students.

Successful delivery in education relies on many people and organisations across the community working together for the benefit of children and young people. We trust the information in ERO's evaluations will help them in their work.

Dr Graham Stoop
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Education Review Office

July 2012

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OVERVIEW

Overview

The New Zealand Curriculum[1] describes teaching as inquiry as a process that involves educators investigating the impact of their decisions and practice on students. In early 2010, the Ministry of Education asked the Education Review Office (ERO) to conduct an initial evaluation,[2] and a follow-up evaluation one year later using the same methodology. The evaluations were to capture, at points in time, the nature of the inquiry teachers were using, and to describe the extent to which teachers were using inquiry to inform their practice. In the initial evaluation, the schools were selected from those scheduled for an education school review in Term 3, 2010.

Findings from the first evaluation were published in the 2011 ERO report, *Directions for Learning: The New Zealand Curriculum Principles and Teaching as Inquiry.* A further group of schools were selected for a follow-up evaluation as part of their scheduled education reviews in Term 3, 2011. This report outlines findings from these schools and focuses on the nature and the quality of the:

• systems and processes established by schools to support inquiry practice, and
• inquiry practice that teachers use in their classrooms.

ERO found that 58 percent of schools had processes in place that were either highly, or somewhat supportive of teaching as inquiry. Where inquiry was working well in classrooms and amongst groups of teachers, all phases of the inquiry cycle were happening. However, teachers and leaders were stronger at the focusing inquiry phase (identifying which students need help), than they were at planning how to respond to them (teaching inquiry) and evaluating how well programmes impact on learners (learning inquiry). These latter stages require a level of problem-solving and evaluation that challenge many teachers. ERO also found this issue in the previous evaluation. It would be useful for leaders to help teachers to develop their competency in both of these areas if they are to achieve the important task of lifting student achievement among priority groups.

Where inquiry practice was not strong, leaders and teachers needed to:

• draw on a wider range of research and/or effective practice when they designed programmes and interventions for learners
• make better use of evidence when they evaluated the outcomes for learners of the programmes and initiatives they had put in place
• use the information they had about students' learning strengths and needs to design appropriate professional learning and development opportunities for teachers.

ERO compared the data from each of the evaluation phases and noted a disappointing drop in the current evaluation in the extent to which teachers were supported with their inquiry practices, and the extent to which they were inquiring into the impact of their teaching on students. Further analysis of the samples by schools' type, location, decile and size found that there were no statistical differences between them. While the two samples differed in terms of the ratio of primary schools to secondary schools, this was not found to contribute to this decline.

There are clear benefits for students and teachers when inquiry happens well. Firstly, students' needs and strengths are responded to quickly and more precisely because teachers have up-to-the-minute information on which to base their teaching decisions. Secondly, the feedback loops that are established when teachers observe, respond and evaluate in "real time" improve their teaching practices.

ERO encourages schools to review the effectiveness of their teaching as inquiry practice, and build on current practice, so that they can better meet the learning needs of all students, particularly priority learners. This includes exploring the factors that make inquiry more successful in some learning contexts than others, with the purpose of supporting teachers to use inquiry more effectively in their day-to-day practices. It is important that teachers adopt teaching as inquiry as a constructive process in which their continuous deep thinking about students' learning, and their responsive actions, pave the way for all students to succeed. Leaders have a critical role in fostering teaching as an ongoing tool for learning.

NEXT STEPS

To make teaching as inquiry a useful and integral part of everyday teaching practice in New Zealand schools and classrooms, ERO recommends:

School leaders:

- review, periodically, the extent to which teaching as inquiry is being used in the school, with the purpose of identifying inquiry practices that are positively impacting on students' learning, and aspects of practice that could be improved
- extend teachers' understanding of inquiry approaches and the ways these can be used to improve learning and teaching, particularly for students whose learning should be accelerated
- establish expectations and guidelines for planning and evaluation that have a clear focus on using analysed assessment information to bring about improved learning outcomes for students
- access support to further develop teachers' understanding of *The New Zealand Curriculum*.

ERO recommends that the Ministry of Education continues to support school leaders and teachers to carry out robust and effective teaching as inquiry practice.

INTRODUCTION

Introduction

In *The New Zealand Curriculum,* teaching as inquiry is described as a cyclical process in which teachers identify the learning needs of groups of target students, and respond to them through planned programmes.[3] The programmes are subsequently evaluated in terms of their impact on student outcomes. This may lead to programme changes if the teaching has not had the desired impact. It may also lead to the identification of new target groups of students.

Inquiry practices usually occur in the classroom by individual teachers, or amongst groups of teachers working towards a common goal. In each of these contexts the focus is the progress and achievement of all learners. Inquiry is particularly beneficial for accelerating the progress of priority learners who are not achieving well. Māori and Pacific students, students with learning needs and students from low socio-economic backgrounds make up a large proportion of these learners. Teaching as inquiry, put into practice well by teachers, and supported effectively by school leaders, has the potential to make a significant difference for these students.

THE EVALUATION FRAMEWORK

The Ministry of Education asked ERO to conduct an evaluation of curriculum development in schools with a particular focus on:

• the extent to which schools' systems and self-review processes guide, inform and support teachers to inquire into their practice.
• the extent to which teachers inquire into the impact of their teaching on students.

METHODOLOGY

The evaluation occurred alongside the scheduled education reviews of schools throughout New Zealand.

ERO used a team of reviewers with particular curriculum expertise for this evaluation. Reviewers collected information in ways that were appropriate to the context of the school. These included document analysis, observations of lessons, observing and participating in teacher meetings, and interviews with teachers and leaders.

In reporting the findings ERO refers to the broad categories of secondary schools and primary schools. The following school types are included in each category.

3   Ministry of Education, (2007). *The New Zealand Curriculum for English-medium teaching and learning in years 1–13.* p.35 Wellington: Learning Media Limited.

Table 1: School categories

Secondary schools	Years 7–15 Secondary schools
	Years 9–15 Secondary schools
Composite schools	Years 1–15 Composite schools
Primary schools	Years 1–8 Full primary schools
	Years 1–6 Contributing schools
	Years 7–8 Intermediate schools

Eighty-two primary schools, 26 secondary schools and five composite schools were selected for this evaluation from the schedule of schools due for an ERO education review in Term 3, 2011. In total, data were gathered from 120 primary and 80 secondary classrooms. In sampling, consideration was given to achieving proportional numbers across year levels and, in secondary schools, to covering a wide range of school subjects. The number of classrooms evaluated in each school was dependent on the school size as shown below.

Table 2: Classrooms by school roll

Roll number	Number of classes
<300	1
300 – 700	2
700 – 1500	3
1500+	4

Refer to Appendix 2 for further information about the demographics of the sample and the numbers of observations at each year level and in each subject area (in secondary and composite schools). Appendix 3 includes information about how the data were analysed.

PREVIOUS FINDINGS AS REPORTED IN ERO'S 2011 REPORT

In the 2011 report, *Directions for Learning: The New Zealand Curriculum Principles and Teaching as Inquiry,* ERO found that in 72 percent of the schools processes had been put in place by school leaders that were either highly, or somewhat informative and supportive in promoting teaching as inquiry. In the most effective schools, leaders had created routines and systems that prompted reflection about student achievement and teaching practice. Typically these systems included reflective journals, end-of-term evaluations, peer observations and discussions as part of the performance management system. Importantly, inquiry was fostered through a culture of shared aspirations to improve learning and teaching, and a desire to work as a team.

In the 28 percent of schools that had minimal or no processes in place, the absence of established school-level systems and active leadership support meant that teachers did not have a clear understanding of teaching as inquiry, or how it could be applied in their classrooms.

ERO had recommendations for school leaders, teachers and the Ministry of Education to make teaching as inquiry a useful and integral part of everyday teaching practice in New Zealand classrooms.

ERO recommended that school leaders and teachers:

• build deeper understanding of the process of inquiry, and the contexts in which teaching as inquiry can be used to improve learning and teaching
• create opportunities for sustainable professional learning about effective teaching practice through incorporating teaching as inquiry into their performance management system.

Background: Inquiry frameworks

In the previous evaluation ERO found that inquiry typically took two forms – teaching and learning inquiry,[4] and professional learning inquiry[5]. In this section we report on the features of each of these inquiry frameworks, and broadly on how schools were using these. In later sections we report on the findings in relation to school-level support and guidance, and the practices teachers used in their classrooms.

In the most effective schools, teaching and learning inquiry, and professional learning inquiry were happening at the same time. Overall, however, much more teaching and learning inquiry was happening than professional learning focused inquiry.

TEACHING AND LEARNING INQUIRY

The primary purpose of teaching and learning inquiry, as described in *The New Zealand Curriculum,* is to bring about improved outcomes for students through a cyclical process that is guided by the following questions:

1. What should students achieve? Where are our students in relation to these goals and priorities? What do students need to learn next? (focusing inquiry)
2. Which strategies, interventions or programmes will support students to achieve these outcomes? (teaching inquiry)
3. What learning happened for students as a result of these strategies, interventions or programmes, and what will teachers do next to ensure that students continue to progress? (learning inquiry).

4   Ministry of Education (2007) *The New Zealand Curriculum for English-medium teaching and learning.* Wellington: Learning Media Ltd.

5   Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007) *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration [BES].* Wellington: Ministry of Education.

As Figure 1[6] indicates, depending on the impact on student outcomes, some phases are given less emphasis and others are revisited on several occasions.

Figure 1: The teaching as inquiry cycle

TEACHING INQUIRY
What strategies (evidence-based) are most likely to help my students learn this?

TEACHING

LEARNING

FOCUSING INQUIRY
What is important (and therefore worth spending time on), given where my students are at?

LEARNING INQUIRY
What happened as a result of the teaching, and what are the implications for future teaching?

Is there something I need to change?

What are the next steps for learning?

A second and similar inquiry approach framework, which is closely aligned to the previous inquiry model, relates to building teachers' capacities to respond appropriately to learners' needs.[7] Leaders and teachers can use the framework to make astute assessments about the gaps in teachers' practices and to identify future development areas for staff. Professional learning inquiry intentionally focuses teachers on the learning that will bring about improved outcomes for students. Any gaps and future development areas for teachers should be closely referenced to learners' needs.

While this framework is not that different conceptually from the previous model, its inclusion in this report draws attention to the significant role which leaders can play in using inquiry for self review and school improvement.

6   This figure is sourced from page 35 of Ministry of Education (2007) *The New Zealand Curriculum for English-medium teaching and learning.* Wellington: Learning Media Ltd. The figure is based on work initially carried out by Drs Graeme Aitken and Claire Sinemma.

7   Timperley, Wilson & Barrar (2007) *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration [BES].* Inside cover and p. xliii Wellington: Ministry of Education.

Figure 2: Professional learning inquiry

**TEACHER INQUIRY AND KNOWLEDGE-BUILDING CYCLE
TO PROMOTE VALUED STUDENT OUTCOMES**

What are our students' learning needs?

What do they already know?

What sources of evidence have we used?

What do they need to learn and do?

How do we build on what they know?

What are our own learning needs?

How have we contributed to existing student outcomes?

What do we already know that we can use to promote valued outcomes?

What do we need to learn to do to promote valued outcomes?

What sources of evidence/knowledge can we utilise?

What has been the impact of our changed actions?

How effective has what we have learned and done been in promoting our students' learning and well-being?

Design of tasks and experiences

Teaching actions

Findings

SCHOOLS' PROCESSES FOR GUIDING, INFORMING AND SUPPORTING TEACHING AS INQUIRY

Leaders create the forums for inquiry to take place. The key to effective inquiry is that it happens in a systematic and continuous manner, and that it leads to changed and improved thinking and teaching. Inquiry is not a discrete act such as a one-off action research project. It is a *'tool [that is used in an ongoing manner] in the service of the professional learning [of teachers] to build the kind of knowledge that will change classroom practice in a way that responds to the students' learning needs.'*[8]

ERO investigated what school leaders did to establish and maintain systems in schools that increased teachers' understanding of the process of teaching as inquiry, and how leaders helped teachers to inquire into the impacts for learners of their classroom practices.

Fifty-eight percent of schools had processes in place that were either highly, or somewhat informative and supportive in promoting teaching as inquiry. In 42 percent of schools, there were minimal, or no processes in place to support teachers' inquiry.

Effective practice was seen where school leaders had worked with teachers to build an understanding about teaching as inquiry. They had progressively established systems to support inquiry, and were monitoring how effectively inquiry was impacting on learning. ERO found that this was happening in only a few schools.

ERO compared the data from each of the evaluation phases and noted a disappointing drop in the current evaluation in the extent to which schools' systems guided, informed and supported teachers to inquire into their practice, and also the extent to which teachers were inquiring into the impact of their teaching on students. In the previous evaluation[9] 72 percent of schools were either highly, or somewhat informative and supportive of teaching as inquiry, while 28 percent of schools had no processes or processes were minimal. See Figure 3 which compares the findings of the two evaluations.

8   Earl, L., Timperley, H., & Stewart, G. (2008) Learning from the QTR&D Programme: Findings of the External Evaluation, p. 21. Accessed from http://www.educationcounts.govt.nz/publications/schooling/49172 on 30 April, 2012.

9   ERO (2011). *Directions for Learning: The New Zealand Curriculum Principles and Teaching as Inquiry.* Wellington: Education Review Office.

Figure 3: Comparison of levels of support and guidance for teaching as inquiry from the 2011 ERO report and this 2012 report
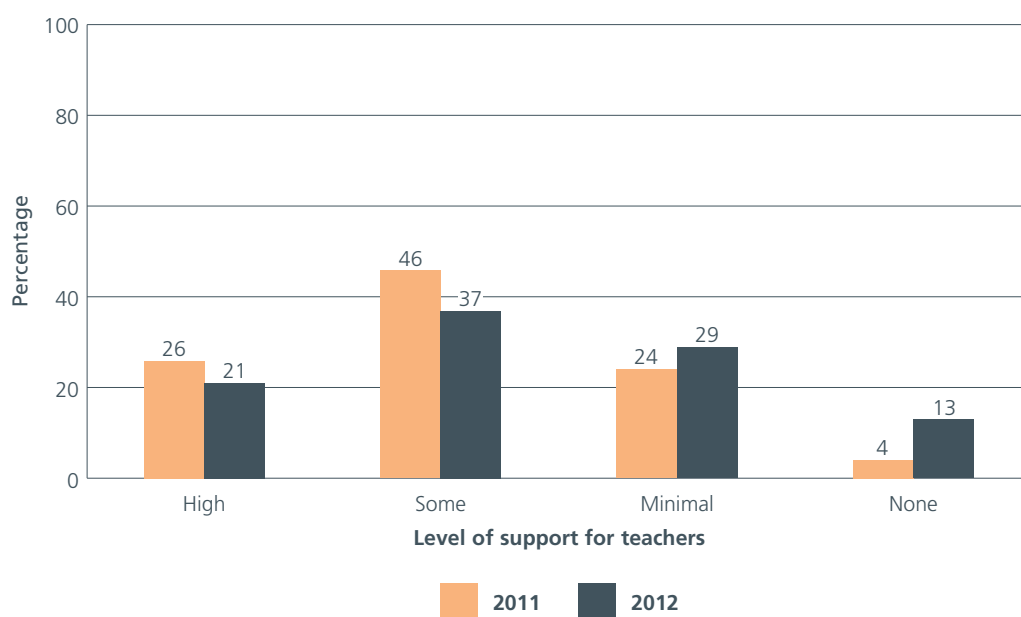
This and other recent ERO evaluation data were further analysed to investigate any differences in the samples that could account for this outcome.[10] Only one difference was found between the samples. In the previous evaluation observations were carried out in 100 primary classrooms and 100 secondary classrooms. In this evaluation ERO reduced the number of secondary schools in the sample because the disruptions in Canterbury schools, caused by the ongoing earthquakes, meant some secondary schools were not included in the review schedule.

It is interesting to note that data collected for ERO's report *Working with National Standards to Promote Students' Progress and Achievement (2012)* showed more evidence of schools using teaching as inquiry in those schools that were working well with the standards than was found in schools that were still developing processes to work with the standards.

10 The differences between observed and expected values were tested using a Chi square test. The level of statistical significance for all statistical tests in this report was $p < 0.05$.

A continuum of support and guidance for teaching as inquiry
ERO noted that there was a continuum in the way leadership was being exercised in schools where systems to support and guide inquiry were less and more effectively developed.

In 42 percent of schools there were limited or no systems or processes established by leaders to support and guide teachers with their inquiry. Specifically, leaders had done little, or nothing to:

• provide opportunities for teachers to engage in inquiry with their colleagues
• develop expectations, guidelines and processes to support teachers' inquiry practice
• develop systems by which teachers were accountable for students' learning outcomes.

In a few of the schools lacking processes to support and guide teachers' inquiry some individual teachers were nevertheless inquiring into their practices. The level of inquiry used in the school was therefore solely dependent on the individual teachers. Teachers had few opportunities to collaboratively talk about successful practices that could also benefit students from other classes.

In schools that were somewhat informative and supportive of teaching as inquiry, leaders had established systems for inquiry. For example, they had set up the performance management system. Nonetheless, there was still some work for leaders to do before inquiry happened consistently and well in these schools. Specifically, teachers were not routinely, and critically, reflecting on their teaching practices. Leaders can help to embed inquiry practice among teacher communities by helping them to make links between the theory of inquiry and the contexts in which it can be applied.

In these schools, inquiry was also practiced by teachers in a less systematic manner. Specifically, there was less effective use of data as the basis of decision making, and limited use of data in reviewing outcomes. Once again, there is a critical role for leaders in promoting the notion that high quality inquiry is founded on the effective use of evidence about students' outcomes.

Typically, in the 21 percent of schools where teacher inquiry was highly informative and supportive, school leaders had established processes for professional learning and reflection. These typically included some of the following:

• performance management systems (PMS) that included a requirement for teachers to reflect on their professional practice[11]
• reflective journals or portfolios that sat outside the PMS system

11 The inquiry-related performance management activities engaged in by teachers were similar to those found in 2011. We describe these activities on page 29 of *Directions for Learning: The New Zealand Curriculum Principles, and Teaching as Inquiry* (May 2011).

- professional development programmes[12] that incorporated opportunities to use an inquiry approach
- research projects in self selected areas that were carried out by individuals and groups of teachers
- self-review processes such as end-of-term programme evaluations and department curriculum reviews that informed planning
- groups of teachers analysing student data, setting targets for priority learners whose progress needed to be accelerated, and reviewing the outcomes for these students.

The value of these processes was in the opportunities they provided for teachers to use inquiry in many aspects of their teaching practice, and to progressively develop the skill and disposition to be reflective and responsive to students.

In these schools, there was a sense that inquiry was well on the way to being embedded and sustained within the school culture. This happened because leaders had helped teachers to build communities where inquiry could happen. For example there were regular meetings to talk about students' achievement and progress, and to strategise about how to help priority learners. As the following example illustrates, collaboration brought momentum and direction to teachers' work.

The teacher is part of a team that has established a school culture of professional learning and critical reflection on programmes and practices. She contributes to self review through her own class learning reviews and through team analysis of achievement patterns. Teachers collaboratively develop achievement targets for groups of at-risk students, and plan how to meet these priorities. Three times a year they review progress towards meeting these targets. (Full primary school, Years 1–8)

Differences by school type

There were some differences in practice by school type. Teaching as inquiry was practised more effectively in primary schools than in secondary schools.[13] Twenty-eight percent of primary schools had highly informative and supportive systems and processes to support teaching as inquiry, compared to three percent of secondary schools. Similarly, substantially more secondary schools compared to primary schools had no processes in place to support and guide teachers in their inquiry. In secondary schools there was less likelihood that inquiry was incorporated into the performance management system or underpinned professional development programmes. Teachers had fewer opportunities to collaboratively analyse student achievement data and to set and review targets for priority students.[14] Figure 4 illustrates these findings.

12 Te Kotahitanga and Assessment for Teaching and Learning (AtoL), were sometimes mentioned.

13 Composite schools were excluded from this analysis because they span all year levels.

14 These findings mirror those reported in ERO's 2012 report *Literacy and Mathematics in Years 9 and 10: Using Achievement Information to Promote Success.*

Figure 4: Levels of support and guidance for teaching as inquiry by school type
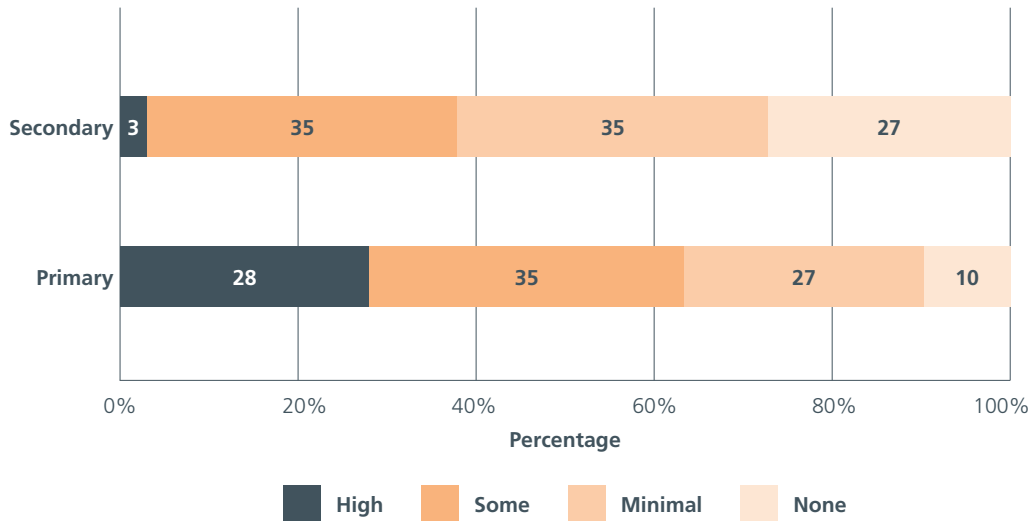
Challenges for school leaders and teachers

ERO found that, even in the schools where there were highly informative and supportive systems established to promote inquiry, there was seldom a strategic focus on building the capability of teachers to meet the specific identified needs of students.[15] Given that teachers will not always be equipped with the content knowledge, pedagogical knowledge or pedagogical content knowledge to address all of the emerging needs of students, it is important that leaders support the development of each teacher's capability to respond to the students in their class.

Illustrative of the gaps in current practice is the use of teacher inquiry goals in the performance management system. Generally these goals were not linked to a focus on lifting the achievement of identified priority learners, but instead focused on an aspect of practice that had captured the teacher's attention.

Some schools used inquiry as a form of action research undertaken through the performance management system. Teachers selected an aspect of their work they wanted to improve, developed an action plan, and then reviewed their progress. Sometimes the process led to sharing the findings with other teachers as the following examples show.

15 The professional learning inquiry model described earlier indicates that there is a close link between what teachers need to learn and the learning needs of students.

The teacher had an inquiry goal as part of the performance management system. The aspect was chosen by the teacher who developed a teaching action plan. Outcomes of the inquiry were shared with other staff at the end of the year. This resulted in the school having a "bank" of inquiry good practice examples. (Full primary school, Years 1–8)

Teachers identified a teaching as inquiry goal as part of the performance management system. They developed action plans to improve aspects of their teaching. At the end of the year they presented these to their syndicates showing the progress made and how it had benefited the students. (Full primary school, Years 1–8)

Missing from the thinking associated with this approach was an understanding of the personal and specific focus of teaching as inquiry. In particular, that each teacher's learning and teaching context is unique, and therefore requires the deep and personal reflection and problem solving of the individual teachers involved.[16] In reference to the first example of inquiry described above, solutions to individual problems of teaching and learning cannot necessarily be "cherry-picked" from a bank of effective practice examples.

The challenge for school leaders is to consider how information about students' learning needs can be used to focus on building the capacity of teachers to improve their students' learning. This might mean that school leaders have to rethink their approach to how professional learning and development happens so that the needs of teachers can be met at an individual level.

16 Hall, E. (2009). Engaging in and engaging with research: teacher inquiry and development. *Teachers and Teaching: theory and practice* Vol.15, No. 6, December 2009, p. 670.

TEACHERS' INQUIRY INTO THE IMPACT OF THEIR TEACHING ON STUDENTS

The extent of teachers' inquiry

ERO looked at how teaching as inquiry was carried out by individual teachers. To do this information was gathered from talking with 200 teachers about their inquiry practices, and through observing teachers working with students.

In 63 percent of classrooms there was high or some teaching as inquiry happening. Of concern were the percentages of teachers who were either using teaching as inquiry minimally (29 percent), or not using teaching as inquiry at all to decide which teaching practices would impact positively on their students (8 percent). The relatively large proportion (37 percent) of teachers in these latter categories indicates the need for additional support to improve some teachers' understanding of the processes, and benefits for learners, of teaching as inquiry. Figure 5 shows the findings for inquiry in the classroom.

Figure 5: Levels of inquiry in the classroom
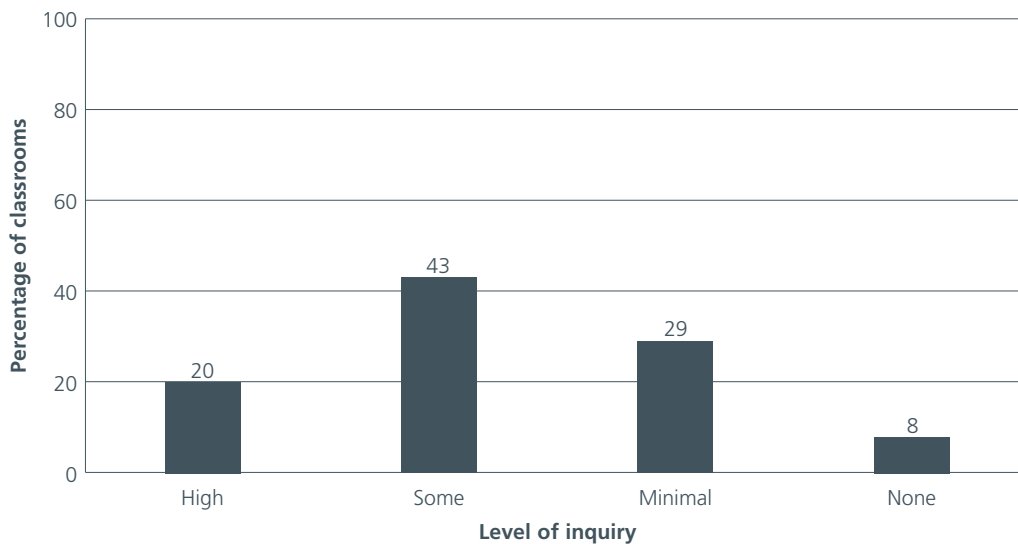
In the schools included in ERO's 2011 evaluation, more teachers were engaged in high or some teaching as inquiry than was found in this evaluation.

The nature of teachers' inquiry

Inquiry in the classroom took the following forms:

- collaborative inquiry (such as data analyses, discussions about best practice, peer observations and peer feedback)
- self review (programme reviews and action research)
- documented personal reflections (such as journals and portfolios)
- reflection in action.

The merit of these inquiry practices lies in the extent to which they are used to improve outcomes for *all* students, and how they are used to focus on the acceleration of priority learners. As such, the practices should not be applied in an ad hoc or irregular manner, but should become part of a toolkit that is drawn upon as part of the everyday practice of teaching.

Collaborative inquiry

Collaborative inquiry was most commonly practised when groups of teachers explored assessment data or achievement findings and made links to possible provision for students. Here is an example of this:

> *Student assessment data and progress is formally discussed two to three times each term. Teachers share with their colleagues information about the progress of students. There are regular discussions with peers about this, including which strategies will be trialled to improve students' learning and engagement.* (Contributing school, Years 1–6)

Collaborative inquiry has the potential to activate teacher's prior knowledge, to encourage reflection, and to challenge entrenched thinking.[17] Through the collective *critical* thinking of the group, new insights can be gained. However, in this evaluation ERO found that as teachers considered future strategies for students they relied on their own teaching experience rather than a critical evaluation of a wider range of teaching and learning strategies. Teachers should expand discussions to include a wider range of teaching and learning strategies, such as published research, and develop the disposition and skills to debate constructively the evidential basis on which strategies and practices should be adopted.

17 Timperley, H., Parr, J., and Bertanes, C. (2009) Promoting professional inquiry for improved outcomes for students in New Zealand. *Professional Development in Education,* Vol. 35, No. 2, June, 2009, pp. 227–245.

Self review

Self review was one of the most prevalent inquiry activities undertaken by teachers. Typically, schools described their self review in terms of one-off or stand-alone evaluations such as departmental curriculum reviews in secondary schools, or programme evaluation in primary schools. Where this review was carried out well, evaluation was ongoing, and there were clear links between the analysis and interpretation of review information and changed practice at a departmental or classroom level as shown in this example.

The teacher looked closely at the analysis of the practice exams and at which areas were poorly taught and which needed to be the focus of revision. Leaders collated information at the departmental level so teachers could collectively talk about the gaps in teaching. (Secondary school Years 7–15)

Several schools thought their performance management system, with its focus on observation and feedback was a form of inquiry:

The principal and the team leader each do a walk through that results in constructive feedback. Teachers who are in the same curriculum groups visit each other's classes to give feedback. (Full primary school, Years 1–8)

However, missing from their appraisal models was the necessary link between particular practices teachers were focusing on in their peer feedback, and measurement of improved outcomes for learners. To strengthen performance management systems, data about student achievement needs to be the basis for the professional learning goals teachers set, and the reference point against which teachers and leaders measure the improvements that have been made with respect to professional growth and impacts for learners.

Many teachers felt that by using formative assessment practices (for example, goal setting, providing feedback to students, and making assessment information available to students) they were engaging in teaching as inquiry. For these formative assessment practices to be lifted into the sphere of inquiry they should also include a necessary focus on the practices that teachers will use to bring about improved student learning. Many teachers still have some thinking to do with respect to how these practices, commonly referred to as "student voice," actually align to a cycle of inquiry that is fundamentally about teacher reflection and action.

As a starting point, it would be useful for teachers to map onto their teaching as inquiry models the points at which student involvement could usefully contribute to their inquiry process. For example, students might contribute to the learning inquiry phase by providing their perspectives on learning – the progress they have made, and the extent to which learning activities have enhanced their engagement. In classrooms where inquiry was being implemented very well, some teachers were encouraging this practice, as this example shows.

Students are active partners in the inquiry process in this class. They have full access to their assessment information and understand and use this to lead their learning in mathematics. They are able to talk about their learning strengths and next steps and are proactive in accessing the support they need. The teacher conferences with students routinely about their progress and achievement towards their learning goals. The learner and the teacher are partners in a reciprocal learning partnership. (Intermediate school, Years 7–8)

Documented personal reflection

In their discussions with ERO, teachers commonly referred to reflection as an example of their inquiry activity. Teachers' interpretation of reflection varied across schools according to the inquiry context in which it was being used. At one end of the continuum were teachers who filled in reflective diaries because this was a requirement of their performance management system. At the other end of the continuum were teachers whose disposition to make learning and teaching better saw them observing students closely, constantly monitoring students' responses, and adjusting the programmes instantaneously.

The latter practices will make the most differences to students' achievement and progress in schools. These teachers had taken up an 'inquiry habit of mind'. As Earl, Timperley & Stewart[18] observe 'an inquiry habit of mind is the habit of using inquiry and reflection to think about where you are, where you are going, how you will get there, and then turn around and rethink the whole process to see how well it is working and make adjustments.'

18 Earl, L., Timperley, H., & Stewart, G. (2008) Learning from the QTR&D Programme: Findings of the External Evaluation, p. 101. Accessed from http://www.educationcounts.govt.nz/publications/schooling/49172 on 30 April, 2012.

Typically, where teachers were using the most robust inquiry processes they were also engaged in the most robust reflective processes. Specifically, teachers:

• were reflective whether they were working with their colleagues or teaching in their classrooms
• attempted to make sense of aspects of their practice that were perplexing or challenging, and sought to identify areas of practice that could be improved
• had an orientation to be creative, innovative and responsive about how to solve teaching challenges
• engaged in inner dialogue or self-talk that had a clear focus on improving learning
• were aware of the principles of effective teaching, and used these to evaluate their programmes and to make choices about next teaching steps
• saw reflection as a necessary and ongoing aspect of their professional growth.[19]

The intent of the teaching as inquiry approach is to build amongst teachers a sense of self responsibility for professional practice. In this evaluation, ERO found examples where teachers viewed inquiry as a predominantly formal process required by school leaders. Reflections were documented, or at least shared orally with others in collaborative forums.

The undertaking inquiry is formalised and embedded in school systems. For example, teachers undertake an inquiry project as part of the performance management system. These projects are linked to strategic goals and they are shared school-wide, including to the board of trustees. (Full primary school, Years 1–8)

Better practice was seen where teachers took self-responsibility for thinking about the impact of their teaching practices on students, and did this in an ongoing way. ERO found that where inquiry was practiced well in the classroom, teachers reflected frequently on their practice, and responded with changes to the programme or teaching approaches. Action included re-teaching aspects of a lesson where learners needed more support, and reorganising mathematics or reading groupings on the basis of observations about students' learning. A key element of teachers' practice was that they responded promptly to what they saw happening for learners. The following example illustrates this.

The teacher is constantly monitoring students' understanding and making decisions about whether to go on or spend more time on a concept. She has several strategies for doing this, one of which is to check in with students from time to time. (Secondary school, Years 9–13)

19 Copeland, W., Birmingham, C., De La Cruz, E. & Lewin, B. (1993) The Reflective Practitioner in Teaching: Towards a Research Agenda. *Teaching and Teacher Education*, Vol. 9, No. 4, p.349.

Reflection in action

Reflection in action, originally conceptualized by Schon,[20] is the process of drawing on knowledge 'to make spontaneous decisions about events as they happen.'[21] It involves inner dialogue or self-talk about teaching practice. Morin[22] asserts that internal dialogue or self-talk is a "cognitive tool the individual uses to reach a solution." The features of this self-talk include:

- the identification of a problem of practice (*"this student does not understand"*)
- thinking about what might be done to address it (*"I could explain the ideas again or maybe she just needs more time to practise"*)
- prioritising approaches that might work (*"which option will I choose?"*)
- evaluating the effectiveness of the approach (*"he understood when I explained the ideas again, so that was useful"*)
- readjusting the approach (*"I will need to take time to explain new ideas to her"*).

The practice of reflection in action was less frequently spoken about by teachers in this evaluation. There are two qualities to reflection in action. Firstly, it is dispositional. Teachers take up a reflective stance that involves constant inner dialogue about the link between teaching and students' learning. Secondly, there is usually only a small gap in time between what a teacher observes students doing, and their teaching response.

Reflection was observable in the ways teachers responded promptly to what students were doing. For example, where a student clearly did not understand something, a teacher tried an alternative approach or used a particular prompt to help the student. Responding in-the-moment is the essence of good teaching inquiry, as exemplified by this example.

> *The teacher is a close observer of students' learning in progress. She constantly adjusts her approach as she assesses students' understanding and application. She has a clear outcome in mind and, while learning might go in different directions during the session, she maintains that focus and stays tuned into what she sees students doing and their emerging needs.* (Contributing school, Years 1–6)

ERO considers that using reflection in action represents the most advanced phase in the development of inquiry as a way of operating in New Zealand classrooms. Over time, and with good support from leaders, reflection in action could become the norm in New Zealand classrooms thereby leading to more responsive and successful teaching and learning.

20 Schon, D. (1983). *The Reflective Practitioner: How Professionals Think in Action.* New York: Basic Books.

21 Ministry of Education (2008). *Ki te Aotūroa: Improving Inservice Teacher Educator Learning and Practice Te Whakapakari I te Ratonga Whakangungu Kaiwhakaako.* Wellington: Learning Media. p.77.

22 Morin, A. (1995). Characteristics of an effective internal dialogue in the acquisition of self-information. *Imagination, Cognition and Personality,* Vol.15 (1) p. 47.

High levels of inquiry

In 20 percent of classrooms, teachers were using teaching as inquiry to a high level.

Typically this inquiry was characterised by:

- close observation of students as they were learning, and responding immediately to their emerging needs
- routinely using a range of data, including feedback from students, to assess the impact of their programmes and practices, and then adjusting these accordingly.

However, inquiry did not just happen within the four walls of a classroom. It also happened amongst groups of teachers working at similar year levels. These gatherings were regular events, and there was a clear structure to the meeting that kept teachers focused on the:

- achievement and progress of groups of priority learners
- strategies that could be used to accelerate their learning
- teaching and learning factors that were likely to have contributed to, or detracted from, students' outcomes.

The aspect of practice most likely to impact positively on the achievement of priority students was that teachers kept these students on the agenda, and there was close attention to improving their learning, as this example shows.

There is a lot of teacher dialogue about student achievement data. At team meetings particular students with particular achievement related concerns are discussed and strategies to help these children achieve better are agreed on. Information is kept for each child and they are regularly assessed. Achievement gaps at particular year levels are discussed. (Contributing school, Years 1–6)

A few teachers trialled new strategies. Nevertheless there was a tendency to plan for these priority learners using practices that teachers had used in the past rather than looking wider to see what the best practice literature and research indicated was effective. In a few secondary schools there was evidence that information was being used to alter course content to meet the needs and interests of students. Primary teachers used assessment information more effectively than their secondary colleagues for the purposes of improving student outcomes. They regrouped students (particularly in mathematics and reading), or adjusted their planning so it better aligned to what they had observed about student's learning.

Some levels of inquiry

Forty-three percent of teachers used some inquiry in their classrooms. These teachers differed in their practice from those teachers who were using high level inquiry practice. Specifically, their inquiry was:

- less likely to include all phases of the inquiry cycle
- less likely to be used routinely in class
- more focused on tracking and monitoring groups of students rather than on looking at the achievement and progress over time of individual priority learners
- more variable across classes, year levels and departments
- more likely to be programme review, rather than responsive classroom teaching (especially in secondary schools).

Minimal or no inquiry

In classrooms with minimal or no inquiry, there was a tendency for inquiry to be focused on compliance, for example undertaken as part of a performance management system, or to be treated as a one-off activity. The need to cover course content in some secondary schools meant that teachers felt that they had little opportunity to use assessment and evaluation information to interpret the curriculum flexibly and responsively for their students. This is likely to have impacted on their inclination to engage in meaningful inquiry.

In the small number of schools where expectations for inquiry had been developed, most teachers were not following these, or leaders were not following up with support so that good quality inquiry could happen. In a few schools teachers simply did not understand what teaching as inquiry was about, or had made little progress in implementing an inquiry approach. The positive leadership features noted in schools where inquiry was well developed were absent in these schools.

Where school-level support is high, teachers can use inquiry better. In 72 percent of classrooms where inquiry was happening well, there were also corresponding good levels of support and guidance for teachers to carry out this inquiry. By implication, leaders have a significant role in ensuring that high quality support and guidance is in place for teachers and for the benefit of students.

Differences by school type and subject area

Some differences in practice were evident by school type. Teaching as inquiry was being used more effectively in primary classrooms than in secondary. In approximately 30 percent of primary classrooms, teachers were engaging in high levels of teaching as inquiry, compared to seven percent of secondary teachers. Almost half (46 percent) of secondary teachers engaged in some or minimal inquiry indicating the need for some focused support for this sector. Too many of our secondary students are leaving school without the necessary qualification to enjoy economic success.[23] It is vital that secondary teachers use inquiry to identify:

• who needs help
• what support should be given to them to improve,
• whether the support given them has worked.

Figure 6 illustrates the findings about teaching as inquiry by school type.

Figure 6: Levels of inquiry by school type
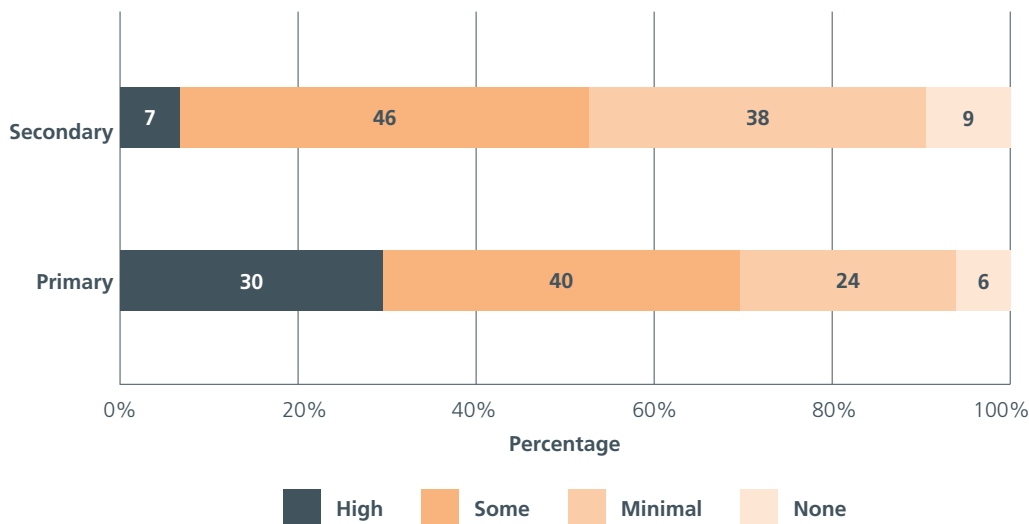
It is likely that the organisational structure within primary schools facilitated greater opportunity for inquiry practice than in secondary schools. Evidence suggests that in primary schools teachers had more frequent occasions to meet and discuss student achievement across a range of learning areas, and to plan for students' learning.

23 Key, J. (2012) *The Prime Minister's Result for New Zealanders.* Retrieved from http://www.beehive. govt.nz/sites/all/files/The_ Prime_Minister's_results_ for_New_Zealanders.pdf (15 March 2012).

Nonetheless, it would be useful for leaders in secondary schools to consider ways that they could encourage collaborative inquiry, and more frequent individual teacher inquiry. It would also be worthwhile for secondary leaders to consider the ways that inquiry could complement existing school self review, particularly how teachers could gather information for review in their daily work in the classroom using an inquiry approach.

Eighty classrooms were visited in secondary schools during this evaluation. ERO looked at a range of subjects (see appendices for details)[24] during these visits. Analysis was undertaken to see if there were any differences in inquiry practice by subjects. There were no statistical differences in practice between subject areas. Similarly, 120 classrooms were visited in primary schools, and there were no clear differences in the quality of the inquiry undertaken by teachers at different year levels in these schools. There were no apparent patterns in the extent to which primary and secondary schools were using teaching as inquiry practice when analysis was carried out by decile group.

DISCUSSION

Evaluation practice

ERO identified some areas in which teachers' inquiry practice could be improved. While teachers had anecdotal information about the effectiveness of their teaching, they seldom based their claims on evidence of improved outcomes for students. Evaluation documents were typically descriptions of learning and teaching activities, and students' reactions to them. Both of these forms of reflection have limited potential to inform teaching practice.[25]

A lack of guidance and direction from school leaders about what was effective evaluation, and how to carry it out, impacted on teachers in some schools. In other schools, there were very clear expectations, and teaching as inquiry was integrated into school-level systems such as monitoring priority students and accounting for their progress through the performance management system and collaborative inquiry.

However, some teachers viewed these systems of accountability as a requirement that had to be met rather than an activity that they took up voluntarily, as the following examples show.

Through the appraisal process, the teacher set an individual teaching goal that was linked to student achievement targets, but it was done as "implementation" rather than as a desire to know how well students had achieved. (Full primary school, Years 1–8)

24 Particular subject/learning areas were not looked at in primary schools because of the degree to which they operate an integrated approach to teaching and learning.

25 In Sinnema and Robinson's study of teacher evaluation, a similar pattern was found. Sinnema, C., & Robinson, V. (2007) The Leadership of Teaching and Learning: Implications for Teacher Evaluation. *Leadership and Policy in Schools,* 6:319-343, 2007.

The principal and deputy principal have "chat and track meetings" with each teacher to monitor student progress, however evaluation is not an integral part of teachers' regular classroom practice. Teachers are not intrinsically motivated to use inquiry in their classrooms. (Contributing school, Years 1–6)

ERO found that requirements for end of term unit evaluations and contrived inquiry as part of the performance management processes did not necessarily foster high quality teacher inquiry of the kind that improved teachers' practices or ensured that inquiry happened routinely in classrooms.

Leaders could play a more helpful role in improving inquiry practice by ensuring that:

- tools and processes used in evaluation appropriately focus teachers on outcomes for students, particularly priority students
- information gathered through evaluation is used as the basis of decision-making (thereby conveying to teachers the usefulness of evaluation and inquiry)
- teachers understand that evaluation information is a resource 'for increasing the validity of their own and others' assumptions about their students, how to teach them, and the effectiveness of current practice."[26]

Planning future learning and teaching

The New Zealand Curriculum states that the teaching inquiry phase involves teachers in using 'evidence from research and from their own past practice and that of their colleagues to plan teaching and learning opportunities aimed at achieving the outcomes prioritised in the focusing inquiry.'[27]

A small number of schools used their own practice *and* made use of research and best practice literature in deciding what to do for priority learners. However, most teachers drew heavily on their own routine practices and their experiences in the classroom, rather than looking wider to what practice could be adapted. This is not necessarily a problem if there is a good fit between the needs of students and the ideas, strategies and solutions offered by teachers. However, this will not always be the case.

Inquiry is not about preserving the status quo, unless this is known to be working well. It is about possibility thinking and being ready to explore new ways of doing things that might have better outcomes for students (Ministry of Education, 2008).[28] Reid[29] states:

Inquiry can be an exercise in navel gazing, or it can offer a powerful means to look outwards, engaging with ideas, innovations and research that are circulating in wider society. Questions such as: how do others see this issue? What are others doing? What does the research tell us? – are all ways of expanding the possibilities of inquiry.

26 Robinson, V. (2011) *Student-Centred Leadership.* San Francisco: Jossey-Bass. p.97.

27 Ministry of Education, (2007). *The New Zealand Curriculum for English-medium teaching and learning in years 1–13.* p.35 Wellington: Learning Media Limited.

28 Ministry of Education (2008). *Ki te Aotūroa: Improving Inservice Teacher Educator Learning and Practice Te Whakapakari I te Ratonga Whakangungu Kaiwhakaako.* Wellington: Learning Media. p.77.

29 Reid, A. (2004). Towards a Culture of Inquiry in DECS. Occasional Paper Series, no. 1. Adelaide: South Australian Department of Education and Children's Services. p.4.

30 Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher Professional Learning and Development: Best Evidence Synthesis Iteration [BES].* Wellington: Ministry of Education.

Tillema, E., & van der Westhuizen, G. (2006) Knowledge construction in collaborative enquiry among teachers, Teachers and Teaching: *Theory and Practice,* 12 (1), 51-67.

Copeland, W., Birmingham, C., De La Cruz, E. & Lewin, B. (1993) The Reflective Practitioner in Teaching: Towards a Research Agenda. *Teaching and Teacher Education,* Vol. 9, No. 4, p.347-359.

31 Berry, A. (2009). Professional self-understanding as expertise in teaching about teaching. *Teachers and Teaching: theory and practice.* Vol. 15, No. 2, April 2009, p. 307.

32 Berry, A. (2009). Professional self-understanding as expertise in teaching about teaching. *Teachers and Teaching: theory and practice.* Vol. 15, No. 2, April 2009, p. 309

Another area that teachers could expand their thinking and actions relates to deep reflection about teacher practice. There is a strong body of literature[30] indicating the benefits of dialogue in which teachers unpack their taken-for-granted beliefs about teaching and learning, reflect on the merits of their habitual practices, and explore alternative ways of operating. The sheer intensity of teachers' work in the classrooms means that some teachers are operating in 'a doing environment [rather] than in a knowing environment.'[31] In order to develop a critical awareness about themselves as practitioners, teachers need opportunities to talk about their work and why they do things certain ways. This self awareness includes looking at 'one's own behaviours and practice in a professional practice context... to monitor and inform teacher's pedagogical actions.'[32] In a very small number of schools, there was a sense that this was beginning to happen.

As indicated in the excerpt below, change will happen when teachers are given permission, by leaders, to be innovative and are encouraged to critically reflect on how well initiatives have worked.

The school's learning culture supports risk-taking amongst teachers. There is permission from the school leaders for teachers to try new things. The teachers are reflective and responsive to information they gather about student achievement. (Contributing school, Years 1–6)

In fostering this culture, there is a role for leaders in:

• providing teachers with opportunities to evaluate new ideas, practices or approaches, to understand them in the context of their work, and to see how they might be applied in their classrooms
• encouraging a critical stance in evaluating the solutions that are put forward in collaborative inquiry
• fostering a culture of openness and trust, where teachers can challenge each other, and exchange ideas freely.

ERO encourages schools to use the following sources to further develop their knowledge of *The New Zealand Curriculum:*

• Ministry of Education regional offices – contact them to ask for support from a *New Zealand Curriculum* facilitator
• *The New Zealand Curriculum Online* and Key Competencies online to access information and support
• *New Zealand Curriculum* Updates published in the *Education Gazette.*

Conclusion

The phases of inquiry – focusing inquiry, teaching inquiry, learning inquiry – represent three important stages in a process that focuses teachers on:

• which learners need help
• what they need to learn
• what should be done to support them
• whether learners have successfully achieved the goals and targets teachers have prioritised for them.

While 20 percent of teachers were using this process very well, 37 percent of teachers were either using inquiry minimally or were not using it at all. The implications for the students in their classes are significant. ERO has outlined suggestions for improving practices so that leaders and teachers are better equipped to respond to all learners. These improvements are especially required for those students whose achievement and progress must be accelerated.

The systems, processes, practices and expectations leaders put in place, and the attention they put into maintaining these systems, convey to teachers what is valued in the school culture. Leaders should extend the scope of teachers' current inquiry practices by:

• shifting the prevailing view that reflection is a *technique* that should result in some form of tangible outcome that should be shared with colleagues and/or leaders
• fostering the notion that inquiry is a valuable process that can greatly contribute to their practice, and to outcomes for students
• helping teachers to include inquiry in their daily practice.

The most common inquiry activities used by teachers were: classroom-based programme evaluation (in primary schools); departmental curriculum review (in secondary schools); and collaborative teacher inquiry. Less apparent among teachers were the moment-by-moment reflections and responses to how students were learning that are at the heart of effective teaching. It would be useful for leaders to explore with teachers a range of formative inquiry approaches and assess the impact that these have on professional practice and on students' learning and engagement.

Teaching as inquiry was happening more effectively in primary schools than it was in secondary schools. It is possible that more sustained interaction with groups of students, and more frequent opportunities to meet and discuss student achievement across a range of learning areas, facilitated better inquiry practice in primary schools. It would be worthwhile for secondary school leaders to investigate ways that teaching as inquiry

CONCLUSION

could be used more frequently to lift the achievement of priority students. There were no clear differences in the extent to which inquiry was happening at different year levels in primary schools or between subject areas in secondary schools.

ERO encourages school leaders to develop a better understanding of the nature of inquiry, the benefits it can bring to teachers' professional practice, and the extent to which inquiry is happening in their schools. It would be useful for them to review the extent to which good quality inquiry is currently being practiced. Leaders should use the findings to identify the contexts in which it is being used successfully to improve students' learning, and the gaps in practice that represent lost opportunities to make a difference for students. A reference point for this review could be the extent to which teachers have the capacity, and the opportunity to:

- clarify meanings
- identify issues/problems/dilemmas/puzzles/successes
- develop significant inquiry questions
- collect data using a range of processes
- locate and draw on relevant research
- critically interrogate their own and other's practice and data
- analyse/interpret and theorise quantitative and qualitative data
- develop and implement strategies that are focused on enhancing student learning outcomes
- assess the extent to which strategies or action have improved learning or the learning environment.[33]

In response to the findings from our 2011 report the Ministry of Education, through Learning Media, has produced a resource to support schools to better understand teaching as inquiry.[34] It would be useful for the Ministry to continue to provide support to teachers in this way, giving priority to building teachers' and leaders' capacities to use inquiry as a form of responsive pedagogy.

33 These criteria were sourced from: Reid, A. (2004). *Towards a Culture of Inquiry in DECS.* Occasional Paper Series, no. 1. Adelaide: South Australian Department of Education and Children's Services. p.7.

34 See The New Zealand Curriculum Update, Issue 12, August 2011 from *The New Zealand Gazette.*

Next steps

To make teaching as inquiry a useful and integral part of everyday teaching practice in New Zealand schools and classrooms, ERO recommends:

School leaders:

- review, periodically, the extent to which teaching as inquiry is being used in the school, with the purpose of identifying inquiry practices that are positively impacting on students' learning, and aspects of practice that could be improved
- extend teachers' understanding of inquiry approaches and the ways these can be used to improve learning and teaching, particularly for students whose learning should be accelerated
- establish expectations and guidelines for planning and evaluation that have a clear focus on using analysed assessment information to bring about improved learning outcomes for students
- access support to further develop teachers' understanding of *The New Zealand Curriculum*.

ERO recommends that the Ministry of Education continues to support school leaders and teachers to carry out robust and effective teaching as inquiry practice.

NEXT STEPS

APPENDIX 1

Appendix 1: The evaluation framework

Table 1: Evaluation framework

Evaluation Focus	Level of the school	Evaluation Question	Categories used to describe practice
Teaching as Inquiry	School	To what extent do this school's systems and self-review processes guide, inform and support teachers to inquire into their practice?	Highly informative and supportive Somewhat informative and supportive Minimally informative and supportive Not informative and supportive
Teaching as Inquiry	Classroom	To what extent do teachers inquire into the impact of their teaching on students?	High levels of inquiry Some levels of inquiry Minimal levels of inquiry No evidence of inquiry

Appendix 2: Sample of schools

The following demographics relate to the sample. It should be noted that due to the fact that schools were selected on the basis of a review schedule rather than by demographic characteristics, the sample does not reflect the national percentages in terms of school type, school decile group, school size, or school locality.

Table 1: Schools by type

School type	Number of schools	Percentage of sample	National percentage[35]
Full primary (Years 1–8)	34	30	44
Contributing (Years 1–6)	40	35	32
Intermediate (Years 7–8)	8	7	5
Composite (Years 1–10)	1	1	<1
Composite (Years 1–15)	4	4	4
Secondary (Years 7–15)	9	8	4
Secondary (Years 9–15)	17	15	9
Total	**113**	**100**	**100**

Table 2: Schools by decile

School decile group	Number of schools	Percentage of sample	National percentage
Low (decile 1–3)	30	27	32
Medium (decile 4–7)	41	36	39
High (decile 8–10)	42	37	29
Total	**113**	**100**	**100**

35 The national percentage of each school type is based on the total population of schools as at March 2012. For this study it excludes special schools, kura kaupapa Māori, and the Correspondence School. This applies to decile, size, and locality in Tables 2–4.

Table 3: Schools by size

School roll size	Number of schools	Percentage of sample	National percentage
Very small	7	6	11
Small	18	16	26
Medium	54	48	36
Large	21	19	19
Very large	13	11	8
Total	**113**	**100**	**100**

Table 4: Schools by locality

School locality	Number of schools	Percentage of sample	National percentage
Main urban	63	56	53
Secondary urban	10	9	6
Minor urban	21	18	12
Rural	19	17	29
Total	**113**	**100**	**100**

The following information relates to the subject areas and classrooms visited as part of this evaluation.

Table 5: Secondary school subject areas

Subject area	Number of classrooms
The Arts	7
English	17
Health and physical education	7
Languages	4
Mathematics and statistics	15
Science	13
Social sciences	8
Technology	9

Table 6: Number of classrooms visited by year levels

Years 0–2	29
Years 1–3	2
Years 1–4	1
Years 3–4	28
Years 5–6	32
Years 7–8	28
Year 9	17
Year 10	15
Year 11	16
Year 12	16
Year 13	16
Total	**200**

APPENDIX 3

Appendix 3: Data analyses

Review officers entered information into an electronic synthesis sheet for each school. This included qualitative information for most questions, and ratings for selected questions.[36] The ratings were moderated by a team of experienced evaluators to cross–check that judgements had been applied in a consistent manner. Where necessary, adjustments were made to the ratings.

Data were analysed in a range of ways. Qualitative information was coded by themes and quantified to ascertain the magnitude of the findings. Qualitative analysis was also undertaken using NVivo.[37] For example, analysis was conducted on the practices of the schools that had high ratings for certain questions. Quantitative analysis was carried out to see if there were any significant differences in findings by demographic characteristics such as school type, decile, location, and roll size.

36 The ratings related to school level support were: Highly informative and supportive, Somewhat informative and supportive, Minimally informative and supportive, and Not informative and supportive.

The ratings related to the levels of teaching as inquiry in the classroom were:

High levels of inquiry, Some levels of inquiry, Minimal levels of inquiry, No level of inquiry.

37 NVivo is software used for undertaking qualitative analysis.

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