Part I
Thematic Discussion

Chapter 1
The Case for Formative Assessment

Formative assessment refers to frequent, interactive assessments of student progress and understanding to identify learning needs and adjust teaching appropriately. This chapter shows how formative assessment promotes the goals of lifelong learning, including raising levels of student achievement, achieving greater equity of student outcomes, and improving learning to learn skills. The chapter also discusses barriers to wider practice of formative assessment and ways in which those barriers can be addressed, and concludes with an outline of the study scope and methodology.

Assessment is vital to the education process. In schools, the most visible assessments are summative. Summative assessments are used to measure what students have learnt at the end of a unit, to promote students, to ensure they have met required standards on the way to earning certification for school completion or to enter certain occupations, or as a method for selecting students for entry into further education. Ministries or departments of education may use summative assessments and evaluations as a way to hold publicly funded schools accountable for providing quality education. Increasingly, international summative assessments – such as OECD's Programme for International Student Assessment (PISA) – have been important for comparing national education systems to developments in other countries.

But assessment may also serve a formative function. In classrooms, formative assessment refers to frequent, interactive assessments of student progress and understanding to identify learning needs and adjust teaching appropriately. Teachers using formative assessment approaches and techniques are better prepared to meet diverse students' needs – through differentiation and adaptation of teaching to raise levels of student achievement and to achieve a greater equity of student outcomes. But there are major barriers to wider practice, including perceived tensions between classroom-based formative assessments, and high visibility summative tests to hold schools accountable for student achievement, and a lack of

connection between systemic, school and classroom approaches to assessment and evaluation.

The principles of formative assessment may be applied at the school and policy levels, to identify areas for improvement and to promote effective and constructive cultures of evaluation throughout education systems. More consistent use of formative assessment throughout education systems may help stakeholders address the very barriers to its wider practice in classrooms.

This chapter shows how formative assessment promotes the goals of lifelong learning, including higher levels of student achievement, greater equity of student outcomes, and improved learning to learn skills. The chapter then discusses barriers to wider practice of formative assessment and ways in which those barriers can be addressed, and outlines the study scope and methodology.

MEETING GOALS FOR LIFELONG LEARNING

Each of the national and regional governments participating in this study promotes formative assessment as a means to meeting the goals of lifelong learning. They are motivated by quantitative and qualitative evidence that teaching which incorporates formative assessment has helped to raise levels of student achievement, and has better enabled teachers to meet the needs of increasingly diverse student populations, helping to close gaps in equity of student outcomes. Teachers using formative assessment approaches guide students toward development of their own "learning to learn" skills – skills that are increasingly necessary as knowledge is quickly outdated in the information society.

Promoting high-performance: raising levels of student achievement

Formative assessment methods have been important to raising overall levels of student achievement. Quantitative and qualitative research on formative assessment has shown that it is perhaps one of the most important interventions for promoting high-performance ever studied. In their influential 1998 review of the English-language literature on formative assessment, Black and Wiliam concluded that:

> "… formative assessment does improve learning. The gains in achievement appear to be quite considerable, and as noted earlier, among the largest ever reported for educational interventions. As an illustration of just how big these gains are, an effect size of 0.7, if it could be achieved on a nationwide scale, would be equivalent to raising the mathematics attainment score of an 'average' country like England, New Zealand or the United States

> into the 'top five' after the Pacific Rim countries of Singapore, Korea, Japan and Hong Kong." (Beaton *et al.*, 1996, Black and Wiliam, 1998, p. 61)

These findings provide a strong foundation for further research on effective teaching, learning and assessment strategies (including the present study).

Promoting high-equity: education for all

The "What Works" case studies support the idea that formative assessment methods may help create greater equity of student outcomes. Although Black and Wiliam (1998 and in Part III of this study) note that research on the effectiveness of formative assessment is lacking in regard to underachieving students or students' race, class, or gender, it is worth noting that several of the case study schools with large percentages of "disadvantaged" students had moved from "failing" to exemplary status over the past several years. Case study schools featuring programmes specifically targeted to the needs of underachieving students also yielded positive results.

Teachers in the case study schools used formative assessment to establish factors lying behind the variation in students' achievements in specific subjects, and to adapt teaching to address identified needs. Such approaches represent a move away from models of equity that suggest that all children should receive exactly the same inputs (they are "indifferent to difference", Perrenoud suggests [1998]), or "deficit" models that identify certain children as "disadvantaged". Instead, teachers adjust methods to recognise individual, cultural, and linguistic differences between children (see for example, Bruner 1996; Bishop and Glynn, 1999).

Building students' skills for learning to learn

Formative assessment builds students' "learning to learn" skills by:

- Placing emphasis on the *process* of teaching and learning, and actively involving students in that process.
- Building students' skills for peer- and self-assessment.
- Helping students understand their own learning, and develop appropriate strategies for "learning to learn".

Students who are actively building their understanding of new concepts (rather than merely absorbing information), who have developed a variety of strategies that enable them to place new ideas into a larger context, and who are learning to judge the quality of their own and their peer's work against

well-defined learning goals and criteria, are also developing skills that are invaluable for learning throughout their lives.

ADDRESSING BARRIERS TO WIDER PRACTICE

The major (although not the only) barriers to wider practice of formative assessment that emerged from the case studies include:

- The tension between classroom-based formative assessments of student learning, and high visibility summative tests – that is, large-scale national or regional assessments of student performance that are intended to hold schools accountable for meeting standards, and that may hold particular consequences for low or underperforming schools. Too often, highly visible summative tests used to hold schools accountable for student achievement drive what happens in classrooms.
- A lack of connection between systemic, school and classroom approaches to assessment and evaluation. Too often, information gathered through national or regional monitoring systems, or even in school-based evaluations, is seen as irrelevant or unhelpful to the business of teaching. Too often, information gathered in classrooms is seen as irrelevant to the business of policy making.

Addressing the formative-summative tension

While teachers often express ambivalence or resistance to external summative tests, there is nothing inherent in summative assessment to prevent teachers from using formative methods. Indeed, summative results can be used formatively. Yet, in several countries, summative assessments have dominated political debate over education. Often, schools with poor results on public examinations face major consequences, such as threatened shut-downs, reconstitution, or firing of teachers.

In environments where summative tests have high visibility, teachers often feel compelled to "teach to the test", and students are encouraged to meet performance goals (to perform well on tests) at the expense of learning goals (that is, to understand and master new knowledge). Many – if not most – teachers perceive these external assessments as being in conflict with – or even inimical to – the practice of formative assessment. Poorly designed external tests, media league tables which use a narrow set of data to compare performance across schools, and lack of connection between tests and curriculum can also inhibit innovation.

Note that, for the purposes of this study, assessment refers to judgments of student performance, while evaluation refers to judgements of programme or organisational effectiveness. In all cases, the use of data to inform teacher planning of future classroom activities, or at the national level to inform and adapt policies, might be considered as secondary levels of formative assessment. (See the distinction in Allal and Mottier Lopez, included in Part III of this study, between primary use of formative assessment which directly benefits the students who were assessed and secondary uses which foster broader transformations of instruction.)

Strengthening cultures of evaluation

One of the particular interests for this study has been in examining how teachers and school leaders create or strengthen cultures of evaluation. In a culture of evaluation, teachers and school leaders use information on students to generate new knowledge on what works and why, share their knowledge with colleagues, and build their ability to address a greater range of their students' learning needs.

A culture of evaluation refers to the development of a shared language regarding the goals of learning and teaching, as well as a shared understanding of the purposes of evaluation in meeting these goals. Several OECD countries support school-based evaluation as a key component, either as the primary or only form of school-level evaluation, or as a complement to external testing, inspections and programme evaluation. All education stakeholders are thus focused on developing strategies for school improvement. School-based evaluation helps school leaders and teachers to focus their attention on resources and organisational challenges, and to develop solutions appropriate to their circumstances.

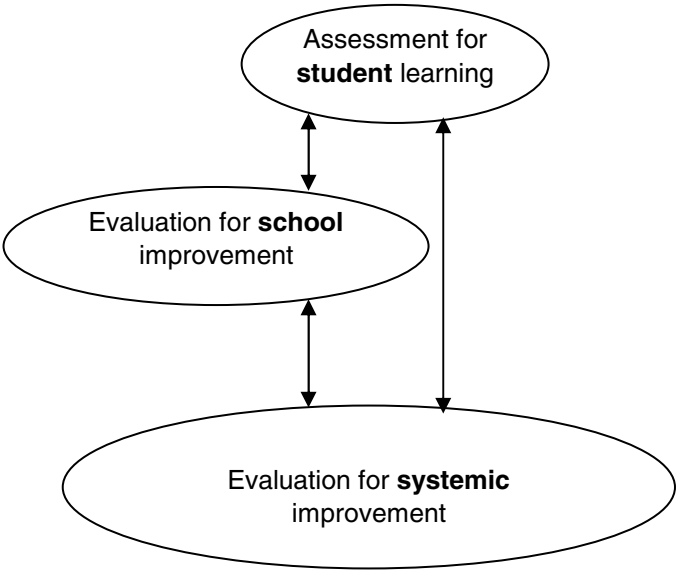
The idea of school-based evaluation is quite appealing because it involves school staff directly, incorporates local knowledge, and potentially, directly shapes school improvement. However, school-based evaluation is not always well aligned with the work of schools. Evaluation tools may be more suited to the needs of policy officials than they are to schools and teachers. Moreover, the skills required for gathering and interpreting school or programme level data are quite different than those required for classroom assessment (Monsen, 2002; Simmons, 2002; Lander and Ekholm, 1998).

Some countries that do not now have external examinations and/or inspection systems are considering adopting such approaches to ensure greater school accountability. By contrast, a few countries that have promoted external examinations are paying greater attention to the potential for school-based evaluation to shape school improvement. Policy officials can learn much from the experiences of their counterparts. No matter which

approach is chosen, assessment and evaluation are only really effective if the data gathered at different levels are taken into account throughout systems.

Ideally, information gathered in assessments and evaluations is used to shape strategies for improvement at each level of the education system. At the classroom level, teachers gather information on student understanding, and adjust teaching to meet identified learning needs. At the school level, school leaders use information to identify areas of strength and weakness across the school, and to develop strategies for improvement. At the policy level, officials use information gathered through national or regional tests, or through monitoring of school performance, to guide investments in training and support for schools and teachers, or to set broad priorities for education. In this way, summative information is used formatively at each level of the system (see Figure 1.1). Teachers, school leaders and policy officials are more likely to use assessment information when assessments are well coordinated, and it is clear why and how the information is relevant to their work.

Figure 1.1. Coordinating assessment and evaluation



Note: Information gathered at each level of the system can be used to identify strengths and weaknesses, and to shape strategies for improvement.

Source: Authors.

Formative assessment – while not a "silver bullet" that can solve all educational challenges – offers a powerful means for meeting goals for high-performance, high-equity of student outcomes, and for providing students with knowledge and skills for lifelong learning. Systems that address tensions that prevent wider practice of formative assessment and that foster cultures of evaluation are likely to make much greater progress toward these goals.

STUDY GOALS AND METHODOLOGY

What can be done to address major barriers to formative assessment? How can policies promote stronger evaluation cultures so that data are used to shape improvements throughout the system (in teaching, in school and in policy leadership)? This study aims to address these questions and to give more shape to the concept of formative assessment as practiced across the participating countries by:

- Bringing together findings from English, French and German-language research reviews on formative assessment (Part III of this study). The international literature reviews have helped to identify common threads among various approaches to teaching and student assessment across countries with different education traditions.
- Examining the range of policy approaches to promoting formative assessment across the case study countries, and the barriers to and opportunities for wider practice.
- Learning more about how teachers have taken on policies and research, and have adapted and made them their own.

International researchers note that, as of yet, there is no "theory of formative assessment". Understanding the elements of effective formative processes is therefore still very much an inductive endeavour. The study aims to clarify and strengthen concepts of formative assessment through international analysis. The study also delineates a framework for understanding the range of policy approaches to promoting formative assessment.

Because the study is international, it presents a broad array of conceptual and policy approaches to formative assessment. The study also helps to reinforce those elements that stand out most consistently as essential to quality teaching and student assessment. Cross-country analysis provides the opportunity to share lessons regarding how teachers, school leaders and policy officials have addressed barriers and realised benefits through formative assessment.

The study includes 19 case studies from exemplary, lower secondary schools in: Canada, Denmark, England, Finland, Italy, New Zealand, Scotland, and the state of Queensland in Australia. Country experts helped to identify suitable cases for the "What Works" study. Criteria for case study selection were as follows:

- To focus on formative assessments used in connection with *deliberate instructional strategies*, illustrating examples of coordinated teaching and assessment strategies that responded to learning styles, skills, interests, and student motivations. Where possible, the case studies needed also to illustrate strategies that promote teachers' abilities to diagnose learning needs, their assessment literacy, and, importantly, their knowledge and capacity to use this in their teaching, individually and collectively.
- To provide *evidence* of "what works". To the extent possible, the cases needed to provide evidence that learning was significantly enhanced by the approach taken.
- To be from the *lower secondary* level. The study was particularly interested in identifying schools that had made significant strides in overcoming powerful bureaucratic constraints – most often found in lower secondary schools – to promote innovation. In addition, students in lower secondary schools are often more vulnerable to developing poor images of their own learning skills, and losing motivation for learning. (Note, however, that formative assessment teaching methods are relevant to students of all ages, including the very young and adult learners.)
- To *involve "whole-school" approaches*. The intention here was to ensure that studies of "what works" in innovation were not limited to one or a few classrooms in the schools visited. Case studies had to illustrate how schools had built their capacity to share knowledge and to influence and build each other's practice.
- To be *embedded in a policy process* or broader initiative that could offer lessons for "scaling-up". Often, policy reforms are limited to a few classrooms, or to a few very high functioning schools.
- To offer lessons of *relevance to the majority* of schools, rather than apply only to very specific sections of the secondary student population. The schools examined needed to offer lessons that would also be applicable to mainstream schools – and not just part of a special initiative with no hope for scaling-up or further dissemination.

The international case studies and literature reviews conducted for the "What Works" study have allowed a thorough examination of the concepts underlying formative assessment, the range of related policy approaches, and common barriers and benefits across countries. While there are inevitable challenges to promoting wider practice of formative assessment across education systems or to addressing organisational and logistical challenges at the school level, the rewards are also likely to be considerable. Formative assessment holds significant promise for improving educational outcomes for individual students, as well as transforming cultures of evaluation across education systems.

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Chapter 2
Policy Frameworks

Transformation of teaching and assessment approaches across education requires strong policy leadership, serious investments in training and professional development and in innovative programmes, and incentives for change. This chapter introduces the range of policy approaches case study countries have developed to promote broader practice of formative assessment. All countries will need to strengthen the mix of strategies they are using and to make deeper investments if they are to promote real changes in teaching and assessment throughout education systems.

Teachers face many competing pressures on a daily basis. Without support and special opportunities to test innovative approaches, it is difficult for them to take on new and more demanding approaches to teaching and formative assessment. At a minimum, teachers need support from colleagues and school leaders as they make changes to their practice. But transformation of teaching and assessment approaches across education systems also requires strong policy leadership, serious investments in training and professional development and in innovative programmes, and appropriate policy incentives.

Policies can encourage and facilitate, but cannot mandate the kinds of deep changes in teaching and formative assessment discussed in this study. The policies, therefore, focus on building teachers' and school leaders' capacity, creating opportunities for innovation, and providing incentives for change. This chapter delineates a framework for understanding the range of policy approaches to promoting effective formative assessment, drawing on examples from the case study countries.

Each of the case study countries has made important strides in advancing the practice of formative assessment. Countries that use a mix of approaches and that make important investments in promoting change and building capacity are likely to push changes much further. The primary policy approaches, which are explored in more detail in the following pages, are:

- *Legislation* supporting the practice of formative assessment and establishing it as a priority.

- Efforts to *encourage the use of summative data for formative purposes* at the school and classroom levels.
- *Guidelines* on effective teaching and formative assessment practices embedded in national curriculum and other materials.
- *Provision of tools and exemplars* to support effective formative assessment.
- Investment in *special initiatives and innovative programmes* incorporating formative assessment approaches.
- Investment in *teacher professional development* for formative assessment.

It should be noted that change is easier in smaller systems, where communication is more direct. But all systems can learn from the experiences of the case study countries – which include both large and small education systems – in their efforts to balance formative and summative assessments, and to better link assessment and evaluation at each level of the system.

LEGISLATION PROMOTING THE PRACTICE OF FORMATIVE ASSESSMENT

In **Denmark** and **Italy,** formative assessment is accorded high visibility in legislation promoting its regular use. The Act governing the Danish *Folkeskoler* system requires schools to make comprehensive and versatile assessments of the "benefits of schooling", and to share these with parents and pupils. According to the Act, assessments are to be integrated into teaching, should serve as the basis for guidance that teachers give to individuals students, and shape teaching methods. The Act stresses that students should be active participants in the assessment process.

The Danish Ministry has more recently proposed the development of national learning standards, and student achievement tests to be administered at key points in students' school careers. Education stakeholders are making efforts to balance effective formative practices with the more recent focus on school accountability and the drive to raise levels of student achievement.

Italy first placed formative assessment on the national agenda in 1977 with legislation introducing the national "valuation form". Teachers are required to use the valuation form to compile data on their students, including information on what has been taught, any discipline issues, and results of assessment (including social, behavioural, cognitive and metacognitive factors). The form is intended to facilitate communication between school leaders, teachers and students. Students are to be kept

informed of the preliminary planning of the subjects and of the teaching schedule, and of marks when they are reported in the register. For primary and lower secondary students, marks are qualitative rather than quantitative.

Nevertheless, Ministry officials note that teaching remains fairly "traditional" in the majority of secondary schools. As a recent Ministry report notes, "[a]ctive didactics, group work, *cooperative learning* are forms that are beginning to be more frequent in nursery and primary school, while they are still rare experiences in the secondary school … [T]he impression is that teachers are aware of the need of innovation and, at the same time, they resist in front of tasks for which they do not feel professionally prepared". (Ministry of Instruction and University Research, 2003, "Attracting, Developing and Retaining Effective Teachers", Country Background Report on Italy, OECD, Paris, *www.oecd.org/dataoecd/54/7/17997702.pdf*, p. 107)

More recent legislation may help remedy these problems. Legislation authorised in March 2003 is aimed at reinforcing the use of formative assessment in classrooms. The reform incorporates the principle of "personalisation". Personalisation refers to differentiation of curricular content and tasks to address learning and cultural differences and special or different educational needs. The reform promotes the "learning laboratory" as a way to tailor teaching methods by providing students with the chance to integrate learning from different classes, engage in hands-on learning and group work, and to study subjects in more depth. The 2003 reform also creates the position of tutor/co-ordinator for each class. The co-ordinators, who are to have teacher training, will be responsible for gathering data from students and talking with families. The teacher can adapt interventions according to the student's needs.

ENCOURAGING THE USE OF SUMMATIVE DATA FOR FORMATIVE PURPOSES AT SCHOOL AND CLASSROOM LEVELS

The use of data for planning of *future* classroom activities (or at the policy level, for adjustment of policies) might be considered as a secondary level of formative assessment (see the distinction in Allal and Mottier Lopez, in Part III of this study, between primary use of formative assessment which directly benefits the students who are assessed and secondary uses which foster broader transformations of instruction). These approaches come closest to reflecting the 3-tiered model introduced in Chapter 1, which links evaluation for systemic improvement, evaluation for school improvement, and assessment for student learning. Countries promote this objective through various means.

Denmark and **Finland** have placed primary emphasis on the importance of school and student self-evaluation. In 1999, the Danish Ministry's Quality in the *Folkeskole* programme published a number of school self-evaluation tools on the web for schools to use at their discretion. Schools are encouraged to use these tools to assess their own performance in a formative way. In addition to looking at students' performance, teachers are encouraged to evaluate the breadth and content of their own teaching. If teaching is limited, then formative assessments of students' work will give a limited picture of students' potential, so the web-based tools are intended to help teachers with this level of evaluation.

The Danish Ministry is now exploring ways to encourage more rigorous approaches and to further develop evaluation cultures in schools. The Danish Evaluation Institute (EVA) has noted, for instance, that there is confusion about evaluation methods and tools that are appropriate for continuous evaluation in classrooms. Potential remedies will include the introduction of standards for student achievement, which will provide schools with better benchmarks (standards are now under development), and further professional development for teachers on appropriate use of data for planning and strategy development.

In **Finland**, the main idea behind school and student self-evaluation is that it is more important to focus on school development through self-assessment than comparison (among schools or among students). Not only the outcomes of evaluation are important, but also the process, because the results of evaluation can serve as a foundation for further development. Therefore, in 1993, Finland's National Board of Education launched a project to develop school self-evaluation practices. The aim of the project is to develop suitable self-evaluation models for different types of educational institutions. The models allow for diversity in educational institutions, but also offer means to municipalities and schools to systematically evaluate the processes of teaching and learning and achievement outcomes. This project could be considered the start of the recognition of self-evaluation as a core concept in the Finnish education system.

The Finnish Ministry of Education monitors the extent to which the objectives set in statutes, education policy decisions and national core curricula are achieved. The purpose of the national evaluation system is to produce information on the quality of learning outcomes. The results of these evaluations are utilised in the development of the education system and core curricula, as well as in practical teaching work. The national evaluation system also supports educational institutions and teachers in the continuous reform of education, on the one hand, and the production and dissemination of diverse, up-to-date and reliable information on the

functionality and results of the institutions and the entire education, on the other hand.

In **Canada**, all provinces and territories participate in a national programme to assess student achievement in mathematics, reading and writing, and science on a four-year cycle. Each province and territory receives its own results as well as an analysis by sub-test. Provinces may then conduct a secondary analysis to shape teaching practices. The three Canadian provinces participating in the study, Newfoundland and Labrador, Saskatchewan, and Québec, encourage schools to use school-level data in school planning.

Before 2002, when **Saskatchewan** Learning in Canada began an Assessment for Learning pilot, no large-scale assessment data for individual schools or school divisions had been made available to schools or to the public. Prior to that time not every school in Saskatchewan gathered assessment data, and not all those who did made use of the data in a systematic fashion. In the face of growing pressure from parents and communities for greater educational accountability, the province started to gather assessment data. However, most educators and administrators in Saskatchewan are strongly convinced that change has to occur at the individual school level. For this reason, the debate about the meaning of any assessment data should primarily take place in each school itself.

Due to the comprehensive and detailed nature of the data provided to schools, local school boards provide resources for each schools' leadership team to attend data-interpretation workshops. No data are given to a school whose leadership team has not attended the data interpretation workshop. These workshops are clearly focused on the idea of assessment for school learning. Schools can use data to help set goals, allocate resources and plan interventions in areas that require improvement, as well as celebrate areas of strength and improvement.

Since 2001, the Department of Education in **Newfoundland and Labrador** has tested student performance in language arts and mathematics on an annual basis. The Department advocates that the results of provincial tests be explicitly linked to school development. In some districts, schools are required to respond to the test data by completing a written analysis of how the school will use the data to improve the quality of instruction and which specific targets the school sets for itself using the data analysis. Testing has changed the culture of communication about school achievement in Newfoundland and Labrador and has triggered communication at various levels. Slightly more than ten years ago, assessment was hardly talked about in schools; now it is driving the change

and school development process, and there is little resistance to it. All school districts are using the test results in a formative manner.

In the early 1990s Her Majesty's Inspectors of Education in **Scotland** published school self-assessment and development planning guidelines that schools could use on a voluntary basis. Since 2001, all schools have been required to use these guidelines to develop school plans. The plans are to refer to data on student performance as gathered in national examinations for 16-year-olds and on attainment levels for students between the ages of 5 and 14 (as established in official targets). School plans are expected to evaluate teaching and learning practices and to include strategies for improvement. The plans are shared with parents and published in school outreach materials and on websites.

In **New Zealand**, schools are required to develop their own charters, and to set benchmarks for performance. The national Education Review Office (ERO) inspects schools, monitoring their effectiveness and whether they are meeting commitments made in individual school charters. Schools typically view ERO reviews as an opportunity to reflect on their strategy and practice, and welcome inspectors into the schools. In turn, the ERO invites teachers from other schools to participate in the ERO process. Teachers view their participation in ERO as an opportunity for professional development.

Italian schools are required to evaluate the success of prior efforts and to plan for the next year in an annual Plan of Formative Offer (POF). The POF is to include a description of: the organisation of teaching time; school-based research and development; and, teaching methodologies to be used in meeting educational objectives. The POF is formally approved by the *consiglio di circolo* (boards of school, students and families' representatives).

GUIDELINES ON EFFECTIVE TEACHING AND ASSESSMENT PRACTICES EMBEDDED IN NATIONAL CURRICULUM AND OTHER MATERIALS

Several countries have introduced new curriculum guidelines that incorporate advice on integrating formative assessment into lessons on a systematic basis. England, New Zealand, Scotland and the state of Queensland, in Australia, provide valuable examples of this approach.

In 2000, the Department for Education and Skills (DfES) in **England** introduced the Assessment for Learning (AfL) programme, targeting pilots to Key Stage 3 schools – that is, lower secondary schools. AfL provides teachers, school leaders, local education authorities and other stakeholders with guidance and resources on the principles of good classroom assessment, as supported in research. DfES promises also to provide a repertoire of teaching strategies and tools from which schools and teachers may choose, based on students' needs and the school's goals and priorities.

In **New Zealand**, assessment for learning has been a key part of the national assessment strategy since 1999. The National Assessment Strategy is designed to help teachers gather and use high quality assessment information to raise achievement and reduce educational inequities. It is embedded in multiple national policies, including guidance in the curriculum framework and the National Administration Guidelines (NAGS). The guidelines establish learning goals ("achievement objectives"), and describe the importance of diagnostic and formative assessment for enhancing teaching and learning. Achievement objectives are intended to provide the basis for planning programmes, assessing student progress, and providing students with clear concepts of learning goals.

Scotland has introduced its own version of the Assessment is for Learning (AiFL) development programme. The AiFL builds on national guidelines on assessment for 5-14 year-old students which were first published in 1990. The guidelines encourage teachers to think systematically about assessment as an integrated part of learning and teaching. They advise that summative judgments should occur only occasionally and should be based on a large amount of class work. In English language and mathematics, when it is clear that a student shows full command of the subject for his or her level, the teacher selects a National Assessment from an electronic bank available from the Scottish Qualifications Authority (SQA). The results of this test are intended to confirm the teacher's judgment. Teachers administer a National Assessment test when they consider it appropriate; there is no "test day" for all at the same time.

The Scottish Executive Education Department (SEED) is now extending the new concept of "Personal Learning Planning" (PLP). PLP emphasises the importance of interaction between student and teacher, and of building students' skills of reflection. Students, with the support of teachers and parents, are expected to take greater responsibility for their own progress toward individually established learning aims.

Almost all of the assessment in **Queensland** schools for all year levels (P-12) is school-based (teacher designed and managed). This applies even for the end-of-school certificate awarded on the basis of study in Years 11 and 12. There have been no external examinations in Queensland since 1972. For the end-of-school certificate, a system of moderation based on panels of expert teachers provides advice to schools on the quality of their assessment procedures and the quality of their judgments of performance standards. Over the two years leading to the certificate, assessment is continuous and all assessments are used formatively. In these years, schools have highly developed feedback processes, including rubrics for providing students with feedback on the standards of their performance on the assessment tasks. These processes foster conversations between teachers and

students about what represents a good performance, how well students have performed, and what they can do to improve further.

A key concept is the integration of formative and summative uses of assessment. In addition to their formative uses, assessments also contribute summatively to the student's final result. Student portfolios are selectively updated over time. This means that earlier performance is replaced by later (improved) performance relating to the same learning outcomes. Students therefore have an incentive to learn from feedback. The students' final results depend on the latest evidence of their performance across all course requirements.

This form of integration of formative and summative assessment is also practiced in the primary and lower secondary years to some extent, and is supported by professional networks and "copying" of senior secondary practice, and is promoted in recently introduced key learning area syllabuses. At all year levels, teacher-directed assessments are used for feedback and for reporting to parents. Existing guidelines emphasise strongly that assessment should be integral to teaching and learning, include feedback to students about their progress, and assist in the development of self-directed learners. Semester reports involve summative judgements based on the accumulated evidence of student performance.

PROVISION OF TOOLS AND TEACHING RESOURCES TO SUPPORT FORMATIVE ASSESSMENT

To enhance assessment literacy in the system the Department of Education in **Newfoundland and Labrador, Canada,** disseminates rubrics for use in primary, elementary, and intermediate schools. Rubrics provide specific guidelines and criteria for evaluating student work. For example, a rubric for an essay might tell students that their work will be judged on organisation, purpose, detail, vocabulary and "mechanics" (spelling, punctuation, grammar). A good rubric also describes levels of quality for each of the criteria, usually on a point scale. In other words, rubrics help students and teachers define quality. Developing rubrics takes time but in the long run, the rubrics save time because they force teachers to reflect carefully on learning objectives and criteria.

The **New Zealand** Ministry of Education has also supported the development of a number of tools for formative assessment. These include Assessment Tools for Teaching and Learning (asTTle) for assessing literacy and numeracy from years 5 to 10, in English and te reo Maori, and national curriculum exemplars for students in years 1-10 in all curriculum areas. The asTTle are a key component of both the government's literacy and numeracy assessment strategies. Teachers use the tools to evaluate the

impact of teaching approaches on student achievement, and when necessary, to adjust teaching to better meet student needs. The national exemplars include annotated work samples and feature sample teacher-student dialogues and written teacher comments, showing how teachers might assess the student work in a formative manner, and in a way that is sensitive to different learning and communication styles of students. They are available in print form and on-line. Many are also supported by video clips.

SPECIAL INITIATIVES AND INNOVATIVE PROGRAMMES

Several schools included in the case study countries participated in pilot or other special projects before deciding to adopt formative assessment teaching methods. Certainly, their participation in special projects signals that these are schools that are more open to innovation and change, and is likely one of the reasons the schools have come to the attention of researchers. Their participation in these projects also helped to prepare the ground for further change.

As participants in special projects, teachers have, in many cases, received additional professional development opportunities, and occasionally, benefited from additional resources. For example, teachers involved in the Maori Mainstream Programme (MMP, *Te Kotahitanga*, in the Maori language) at Waitakere College in **New Zealand** have had a half-time, on-site facilitator. The facilitator works with experts on Maori education at the University of Waikato, brings readings and relevant research to teachers involved in the programme, shares practical ideas on how to address challenges in the classroom, and observes classes. The facilitator is also formative in her own interactions with the teachers. The programme represents a heavy expenditure on the part of the Ministry, however, and policy makers have implemented a variety of professional development models in schools participating in the MMP in order to determine the optimal level of investment.

Teachers at the Michelangelo School in Bari, **Italy**, played an important role in piloting the national valuation form. Between 1985 and 1995, the Michelangelo School was among a small number of schools selected by the Italian Ministry of Education to participate in a project to revise the national valuation form, which had been in use since 1977. Several of the teachers recall that the experience of working together on this demonstration project was key to shaping a strong working relationship among them. In 1995, the current valuation form became a part of regular practice in Italian schools. Teachers at the Michelangelo School have continued to discuss and revise their approaches to assessment as a group.

INVESTMENTS IN TEACHER PROFESSIONAL DEVELOPMENT

Formative assessment requires deep changes in overall approaches to teaching and assessment, as well as the development of new habits and integration of new techniques into daily teaching. Teachers greatly benefit from professional development, mentoring and peer feedback when making these types of changes.

In 1998, the **New Zealand** Ministry introduced the Assess to Learn (AToL) professional development programme. AToL encourages teachers to review current assessment practices, and to incorporate recently developed national assessment tools into their practice in formative ways. AToL programmes are intended to support implementation of new curriculum statements or programmes that meet high priority goals of the Ministry (such as the Ministry's literacy and numeracy programme, and the new National Certificate Examination Award). Apart from these special programmes, however, the Ministry does not require teachers to update their skills on a regular basis.

Queensland has a variety of in-service workshops and professional development opportunities for teachers on assessment. At the senior secondary school level, professional workshops assist teachers in implementing assessment in the subjects they teach. Teacher practice is supported by strong professional networks and professional subject-based organisations. Service on moderation panels (discussed above) is recognised as providing powerful professional development for panellists, and many schools encourage their staff to seek panel membership. Feedback from moderation panels to schools involves teachers in discussions on their assessment practices, both within their school and with the relevant panel. Being wholly responsible for student assessment, teachers continually reflect on their assessment practice and consider how it can be improved. Assessment practice is therefore always evolving.

The situation in the earlier years (primary and lower secondary) is much less externally directed. There is no formal certificate issued to students in these years. Consequently, leverage for professional improvement is weaker. However, regular workshops for teachers and schools are offered by the Queensland Studies Authority (QSA) on teaching and assessing students using the recently introduced key learning area syllabuses. In addition, the three education sectors (State schools, Catholic schools and Independent schools) run their own workshops for teachers and support programmes for schools directed at improving the quality of teachers' use of assessment to assist student learning.

DEVELOPING STRONGER POLICY STRATEGIES

Each of the case study countries has established formative assessment as a high priority. These policies recognise that much of the hard work of reform takes place at the school and classroom level, and that change also requires policy leadership as well as the development of specific tools and support to carry this work through.

Several of the countries use a mix of strategies to promote wider practice of formative assessment. Yet, all countries will need to strengthen the mix of policies and to make deeper investments if they are to promote real changes in teaching and assessment throughout education systems. The greater the range of strategies included in any country's policy mix, the more consistent the messages regarding the importance of formative assessment will be, the more strategic the investment of resources, and the more likely change in culture at all levels of the education system.

Chapter 3
The Elements of Formative Assessment: Case Study Findings and Supporting Research

Several key elements emerged consistently in the case study classrooms and in international research on formative assessment. When teachers regularly draw upon each of these key elements, they create new frameworks for teaching and learning. The chapter refers to selected research to illustrate the importance of each of the elements in promoting learning. *How* teachers apply the elements of formative assessment is also important to impact.

Many teachers already incorporate aspects of formative assessment in their practice – regularly interacting with students, and adjusting teaching to meet identified student needs. But, as teachers in several of the case study schools confessed, prior to establishing formative assessment as an overall framework for teaching, their own use of formative methods had been somewhat haphazard.

School leaders and teachers in the case study schools were motivated to bring discipline to their use of formative assessment through their participation in research or pilot projects, or in response to national or regional policies promoting formative assessment. Many said they had made fundamental changes in their approaches to teaching – in their interactions with students, the way they set up learning situations and guided students toward learning goals – even in the way they thought about student success.

Because the case study countries do not share a common definition of formative assessment, "What Works" national experts used a broad set of criteria to locate exemplary schools. They identified cases where teachers were using coordinated teaching and assessment strategies to respond to student predispositions, learning styles, skills, interests, and/or motivations.

The key elements that have emerged from the case studies and related research are:

1. Establishment of a classroom culture that encourages interaction and the use of assessment tools.
2. Establishment of learning goals, and tracking of individual student progress toward those goals.
3. Use of varied instruction methods to meet diverse student needs.
4. Use of varied approaches to assessing student understanding.
5. Feedback on student performance and adaptation of instruction to meet identified needs.
6. Active involvement of students in the learning process.

What is most striking about the case study findings is that in all cases, teachers had incorporated each of the six elements into regular practice. While teachers may have placed different emphases on the various elements (for example, some teachers placed greater stress on providing students with feedback; other teachers were more focused on providing students with a variety of learning opportunities), they used each of these elements to shape teaching and assessment. Teachers thus created a framework, language and tools, using the elements of formative assessment to shape their approach to teaching and learning.

This chapter looks more closely at each of the elements of formative assessment as identified in the case study schools. The chapter refers to selected supporting research for each of the elements. The research also points to the importance of *how* teachers apply the elements of formative assessment to their impact on student achievement, including underachieving students, and in helping students to develop learning to learn skills.

Across the case study schools, teachers referred to research as they built their facility with formative assessment. They paid particular attention to how they were using formative approaches and the impact of new methods on student learning. Formative approaches spurred teachers' interest in exploring learning theories in more depth, and in experimenting with new teaching methods. Research in the area of formative assessment (and related teaching strategies) has had an unusually strong impact on practice.

THE ELEMENTS OF FORMATIVE ASSESSMENT

The case study findings are consistent with elements identified in English and French language literature reviews in Part III of this study (also see Black and Wiliam, 1998). Black and Wiliam in their extensive review of the English-language literature on formative assessment, "Assessment and Classroom Learning" (1998), consider formative assessment as involving four elements:

- Establishment of a standard or expected level of student performance.
- Gathering of information on a student's current performance.
- Development of a mechanism to compare the two performance levels.
- Development of a mechanism to alter the gap.

Assessment is "formative" when the information gathered is actually used to alter the student's performance gap.

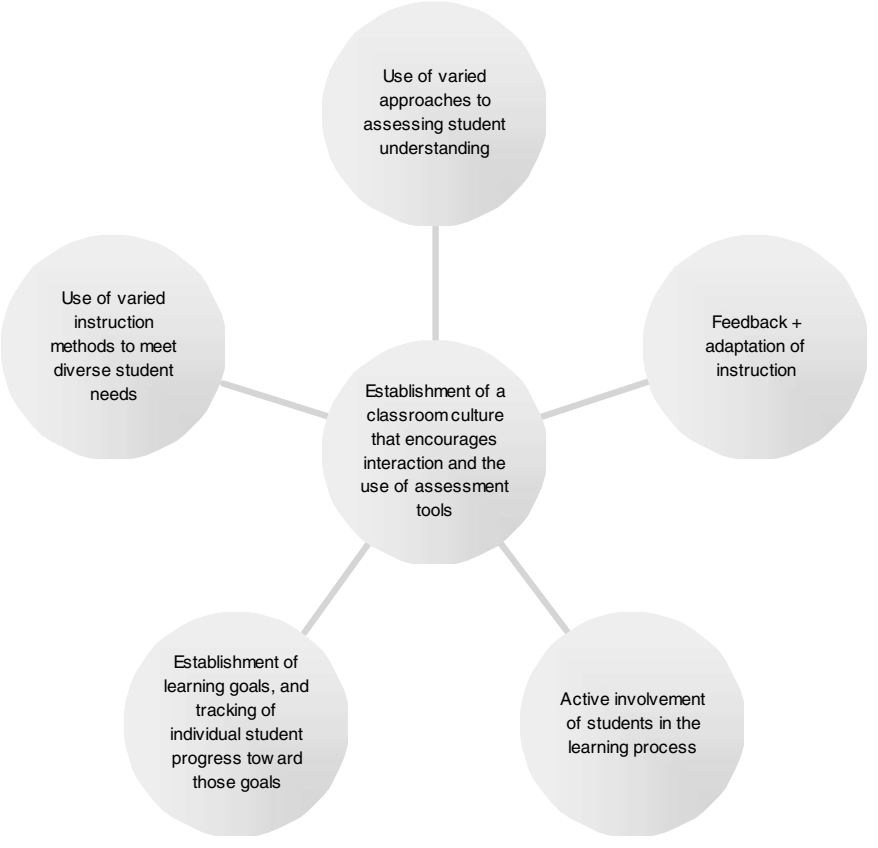
Allal and Mottier Lopez extend this definition in their review of the French-language literature (Part III of this study) by placing a particular emphasis on how teachers organise and orchestrate learning as an important element of formative assessment. This includes:

- The actions that teachers and students actually carry out to alter a learning gap or to arrive at a shared vision of learning objectives.
- The degree of student involvement in the assessment process.
- The meaning attributed by teachers and students to assessment practices and to their effects.

These elements situate formative assessment in a classroom culture involving interaction among teachers and students and the use of assessment tools (Allal and Mottier Lopez, Part III of this study).

Figure 3.1 summarises the understanding of formative assessment developed through the "What Works" case studies and the literature reviews informing this study.

Figure 3.1. The six key elements of formative assessment



Note: Teachers across the case study schools used formative assessment as a framework for teaching and learning. Culture change was central to creating and sustaining regular practice of formative assessment. Teachers drew upon each of these elements to create a dynamic teaching and learning environment and to move students toward learning goals.

Source: Authors.

ELEMENT 1: ESTABLISHMENT OF A CLASSROOM CULTURE THAT ENCOURAGES INTERACTION AND THE USE OF ASSESSMENT TOOLS

The concept of formative assessment was first introduced in 1971 by Bloom, Hastings and Maddaus. They formally introduced the idea that assessment need not be used solely to make summative evaluations of

student performance, arguing that teachers should include episodes of formative assessment following phases of teaching. During these episodes teachers should provide students with feedback and correction as a way to remediate student work. Most experts now consider formative assessment as an *ongoing* part of the teaching and learning process. Formative assessment thus becomes a central element in teaching and learning.

Teachers across the case study schools have integrated formative assessment into their teaching, establishing classroom cultures that encourage interaction and use of assessment tools. In each of the case studies, teachers noted the importance of helping students to feel safe to take risks and make mistakes in the classroom. This is, in part, simply practical: children who feel safe to take risks are more likely to reveal what they do and don't understand, an essential feature of the formative process.

Research also highlights the importance of focusing students' attention on mastering tasks, rather than on competition with peers, and in developing emotional competencies. Emotional competencies, such as self-awareness, self-control, compassion, co-operation, flexibility, and the ability to make judgments on the value of information serve students well in school and throughout their lives (OECD, 2002, p. 58). Emotions also affect the student's self-esteem, motivation and ability to regulate his or her own learning.

ELEMENT 2: ESTABLISHMENT OF LEARNING GOALS, AND TRACKING OF INDIVIDUAL STUDENT PROGRESS TOWARD THOSE GOALS

Several OECD countries have established general standards for student achievement, and monitor students' progress toward those standards. Teachers in several of the case study schools worked together to define the standards in more detail, developing and sharing criteria with colleagues and students, and developing new internal systems to track individual student progress.

Teachers in the case study schools look to these objective standards to set out learning goals for students, sometimes scaffolding these goals for weaker students. The teachers have also moved away from traditional systems of marking – which tend to rely on "social comparison" of student performance (that is, comparison of each students' performance with that of their peers) toward methods that allowed them to track an individual student's progress toward the learning goals, as judged through established criteria.

International research supports idea that tracking a student's progress toward objective learning goals is more effective than is comparison with peers' progress (Cameron and Pierce, 1994; Kluger and DeNisi, 1996; Heckhausen, 1989; and Rheinberg and Krug, 1999). In situations of comparison, weaker students absorb the idea that they lack ability, and thus

lose motivation and confidence. Ames (1992) notes that teachers' beliefs about the importance of effort, rather than ability, also play an important role in students' beliefs about themselves. Appropriate reference to an individual student's progress and opportunities to improve work based on feedback can help counter the negative impact of social comparisons.

Mischo and Rheinberg (1995) and Köller (2001) also found positive effects in several experimental and field studies where teachers referred to student progress over time. Positive effects were identified for students':

- Intrinsic motivation.
- Self-esteem.
- Academic self-concept.
- Causal attributions.
- Learning (see particularly Krampen [1987]).

The establishment of learning goals and tracking of student progress toward those goals makes the learning process much more transparent; students do not need to guess what they need to do to perform well. Teachers also help students to track their own progress and to build confidence.

ELEMENT 3: USE OF VARIED INSTRUCTION METHODS TO MEET DIVERSE STUDENT NEEDS

Teachers in the case study schools adjust their teaching methods to meet the needs of a variety of students. In some cases, this means that they adjust teaching to recognise different emotional styles. Teachers note that more vulnerable students need help in developing greater emotional competency. (For a more detailed discussion on emotions and cognition, see OECD, 2002.) These teachers are concerned with building students' confidence in their own skills and knowledge and in their ability to manage their own learning.

Social and cognitive psychologists, anthropologists and other social scientists have increasingly recognised that the knowledge and experiences children bring to school shape their learning experiences (Bruner, 1996; Bransford *et al.*, 1999). Such prior knowledge is shaped, in part, by learners' ethnicity, culture, socio-economic class, and/or gender. Teachers can help students learn new concepts and ideas in ways that connect to their prior understandings and ways of looking at the world. Teachers who are attuned to variations in cultural communication patterns and sensitive to individual ways of communicating are more likely to draw out what children understand, and how they develop their understanding of new ideas (Bishop and Glynn, 1999).

Research has found that parents can play an important role here, too, because they share their children's life experiences, are well acquainted with their abilities and interests, and can help their children make connections between ideas (Bransford *et al.*, 1999).

Swiss education scholar Philippe Perrenoud proposes that:

> "… [t]o the extent that pupils do not have the same abilities, nor the same needs or the same way of working, an optimal situation for one pupil will not be optimal for another …. One can write a simple equation: diversity in people + appropriate treatment for each = diversity in approach". (Perrenoud, 1998, p. 93-94)

Early research findings suggest that there is a need for a fundamental re-thinking of approaches to reaching equitable student outcomes. But there is also a need for more refined research on the impact of formative assessment methods for different students. Such research might address whether and how formative assessment can address the needs of students based on individual differences, such as emotional style, or ethnicity, culture, socio-economic class, and/or gender

ELEMENT 4: USE OF VARIED APPROACHES TO ASSESSING STUDENT UNDERSTANDING

Teachers in the case study schools use varied approaches to assessing individual student progress over time, in realistic settings, and in a variety of contexts. Students who may not perform well in certain tasks have the opportunity to demonstrate their knowledge and skills in others. Such varied assessments also draw out information on students' ability to transfer learning to new situations – a skill emphasised as important to learning to learn – and on how student understanding might be corrected or deepened. These varied assessments may include tests and other summative forms of assessment, so long as the information on student performance gathered in the tests is used to inform further learning.

Summative results, when embedded in the wider teaching and learning environment, are more likely to be used formatively. They also help to lower the stress of tests, which can have a have negative impact on the self-esteem of lower achieving students (See for example, a study conducted by the EPPI – Centre at the Institute of Education, University of London, June 2002).

ELEMENT 5: FEEDBACK ON STUDENT PERFORMANCE AND ADAPTATION OF INSTRUCTION TO MEET IDENTIFIED NEEDS

Feedback is vital to formative assessment, but not all feedback is effective. Feedback needs to be timely and specific, and include suggestions for ways to improve future performance. Good feedback is also tied to explicit criteria regarding expectations for student performance, making the learning process more transparent, and modelling "learning to learn" skills for students.

In their review of the English-language literature, Black and Wiliam (1998) identified a number of studies, conducted under ecologically valid circumstances (that is, controlled experiments conducted in the student's usual classroom setting and with their usual teacher) to support this point of view. For example, "ego-involving" feedback (even in the form of praise) rather than feedback on the task at hand appears to have a negative impact on performance (Boulet *et al.,* 1990). Students also obtain better results when they are working toward process goals rather than product goals, and when tracking progress toward overall goals of learning (Schunk, 1996). Grades may actually undermine the positive help of specific feedback on tasks (Butler, 1995).

Teachers also benefit from the feedback process. When providing feedback, teachers pay closer attention to what students do and do not understand well, and are better able to adjust teaching strategies to meet identified student needs.

ELEMENT 6: ACTIVE INVOLVEMENT OF STUDENTS IN THE LEARNING PROCESS

Ultimately, the goal of formative assessment is to guide students toward the development of their own "learning to learn" skills (also sometimes referred to as "metacognitive" strategies). Students are thus equipped with their own language and tools for learning and are more likely to transfer and apply these skills for problem solving into daily life; they strengthen their ability to find answers or develop strategies for addressing problems with which they are not familiar. In other words, they develop strong "control" strategies for their own learning.

"Metacognition" involves awareness of how one goes about learning and thinking about new subject matter and is sometimes referred to as "thinking about thinking". The student who has an awareness of how he or she learns is better able to set goals, develop a variety of learning strategies,

and control and evaluate his or her own learning process. As evidence of this, PISA 2000 found that:

> "… Within each country, students who use… [metacognitive and control strategies] more frequently tend to perform better on the combined PISA reading literacy scale than those who do not (although whether the learning strategies cause the better results cannot be established). … [T]he strategies are essential for effective self-regulation of learning because they help students to adapt their learning to particular features of the task on which they are working. Schools may need to give more explicit attention to allowing students to manage and control their learning in order to help them all to develop effective strategies, not only to support their learning at school but also to help them with the tools to manage their learning later in life". (OECD, 2001, p. 110)

Importantly, PISA also found that students are unlikely to use control strategies if they lack motivation or self-confidence (OECD, 2003). Students' personal judgments about their ability to carry out a task ("self-efficacy") also significantly influence task performance (Pajares, 1996). Thus, a key role for teachers is to help children build confidence, and develop a variety of learning strategies.

Teachers in the case study schools model such learning behaviour, teach self-assessment skills and help students to analyse of how well different learning strategies have worked for them in the past. Such teaching approaches may be particularly important for children who do not have extra support for learning at home (OECD, 2003; Bransford *et al.*, 1999).

CREATING POWERFUL FRAMEWORKS

The above discussion illustrates how each of the elements of formative assessment as identified in the international case studies and research, is important to raising levels of student achievement, helping to close achievement gaps, and building students' learning to learn skills. When the elements are used together as an overall framework for teaching and learning, they are especially powerful. Teachers are better able to organise their thinking about how they set up learning situations, uncover student understanding of new concepts, guide students toward learning goals, and involve them more actively in the learning process.

The importance of each of the elements is supported in research. In turn, the overall framework provides a way for teachers to further organise their thinking about student learning, and to make more directed inquiries into

research-based methods on improving student learning. Teachers increase their facility with these methods when they pay particular attention to the impact of the methods they are using on student learning.

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Chapter 4
Formative Assessment in Practice

The "What Works" case studies provide vivid examples of formative assessment in practice. Teachers in the case study schools changed the culture of their classrooms in order to encourage greater interaction, and to incorporate the use of assessment tools. The formative assessment framework allowed them to integrate and create new approaches and techniques into their regular teaching practice.

The countries, provinces and schools contributing to this study provide vivid examples of formative assessment in practice. These examples are of interest to both policy officials and practitioners, as they move the discussion from broad principles – such as rhetoric regarding the importance of "child-centred learning" – to concrete descriptions regarding the changes such approaches entail. The following discussion follows the framework established in Chapter 3 and summarised in Figure 3.1, to illustrate the different ways teachers made formative assessment an integral part of their daily teaching.

ELEMENT 1: ESTABLISHMENT OF A CLASSROOM CULTURE THAT ENCOURAGES INTERACTION AND THE USE OF ASSESSMENT TOOLS

Teachers in the case study schools changed the culture of their classrooms in order to encourage greater interaction, and to incorporate the use of assessment tools. Themes which emerged consistently across the case studies were:

- Helping students to feel safe and confident in the classroom.
- Recognising students' individual and cultural differences.
- Planning for student learning, rather than merely planning activities.

Teachers across the case studies also noted that they needed to share their power with students in order to create a real culture change within the classroom.

Helping students feel safe and confident in the classroom

In each of the case studies, teachers placed emphasis on helping students feel safe and confident in the classroom. Students demonstrated the success of these approaches when, for example, they told case study researchers that "it's okay to make mistakes – that's how we learn".

At the Statens Pædagogiske Forsøgscenter School (SPF) (the National Centre for General Education) in Copenhagen, Denmark, teachers emphasised that students must feel self-confident in class if they are to dare to show and use what they are able to do. Activities to facilitate this in the school are: reading and telling stories, writing stories, use of logbooks and diaries, listening to music, interviewing other people, and inviting guest teachers. Humour and fun are developed through play, games, video production, role plays, etc. Through these techniques, teachers are able to engage students and help them feel secure and confident in the classroom environment. At the same time, students develop their own verbal competencies. The oral tradition is quite important in Danish education.

Several teachers in the English case study schools mentioned that they worked hard to keep the classroom a safe place for taking risks. While teachers often follow a "no hands up policy" to avoid calling only on more confident and outgoing students, teachers provide students with enough time to think before they answer a question in order not to embarrass a student who is less sure of him or herself. Teachers sometimes give students the chance to discuss answers in pairs or in small groups prior to opening class discussion. Teachers sometimes also seek to bring quieter students into the discussion, asking them if they agree with another student's answer.

Recognising individual and cultural differences

Teachers who understand their own cultural preconceptions and allow students to express their own identities and cultures in classrooms are better able to meet a diversity of learning needs. As an example of this, the New Zealand Ministry of Education is sponsoring the Maori Mainstream Programme (MMP, also known as *Te Kotahitanga* programme) to respond to the needs of Maori students, who have traditionally performed less well than other groups – even in well-off schools. While the programme was designed to meet the needs of a specific group, its principles are generally relevant to educators, particularly as classrooms are increasingly diverse, and there are notable differences in the equity of educational outcomes for minority or disadvantaged students.

The MMP is built on principles of Kaupapa Maori, which is based on a critical analysis of the unequal power relations within society (Bishop and

Glynn, 1999).[1] Within this framework, the importance of culture is paramount. The MMP encourages teachers to understand their own cultural preconceptions and to create environments in which children can safely bring "who they are" into the learning situation.

Maori researchers Bishop and Glynn note that:

> "... many Maori children … had been socialised into family, community and peer groups where both group competition and cooperation were valued, where both group achievement and peer solidarity were dominant, where the complementary nature of abstract and concrete thought, physical and social achievements, and religion and culture were emphasised. Socialisation of Maori children emphasised the interdependence of the group and the individual". (Bishop and Glynn, 1999, p. 36)

The MMP therefore emphasises group work, co-construction of knowledge, and peer solidarity. (One student told case study researchers that they feel like they were brothers and sisters growing up together.) A teacher in the MMP noted, "You are often told as new teachers to be tough and keep it quiet, individuals in their seats, and to have quiet classrooms. But in this programme you can have noisy engaged learning and it is not a discipline problem". The school is known for being relatively strict – so noisy learning in the MMP classrooms gets noticed. But, the MMP teachers noted that they have fewer discipline problems than other teachers who follow the stricter approach to teaching. Students said that they relate to their teachers better in the MMP classes.

In another example, teachers at the Italian Michelangelo School in Bari use varied approaches to getting to know students and to better understand their abilities, acquired knowledge, and approaches to learning. Because students are increasingly diverse with regard to knowledge and competencies, cultural and ethnic identities and backgrounds, using formative assessment has been important for both students and teachers in understanding what they need to do to improve student learning, and to adjust lessons.

Planning for student learning, rather than merely planning activities

Teachers in the case study schools noted that their lesson plans have changed: they now place greater focus on what students *learn* in class, as opposed to what students *do* in class. One teacher noted, "Rather than

[1] Bishop, R. and T. Glynn (1999), *Culture Counts: Changing Power Relations in Education,* Dunmore Press, Palmerston North, New Zealand.

thinking of which article in the newspaper or which page in the text I'm going to use, I'm really thinking of which formative assessment I'm going to use, or a bit of both. … But you've got to have the energy to do it".

Teachers in the Michelangelo School in Italy noted that they draw upon learning theories as they set up new situations, but that they are also careful to pay attention to the impact of different approaches. They said that they "… don't think they have sure and absolute recipes" and are "humbly aware in every moment of the complexity in working with human subjects whose answers are not always foreseeable". Teachers at the school try to be creative, flexible, and self-critical in their work. They are engaged in ongoing action research, and update teaching tools according to experiences and the changing needs of students.

ELEMENT 2: ESTABLISHMENT OF LEARNING GOALS, AND TRACKING OF INDIVIDUAL STUDENT PROGRESS TOWARD THOSE GOALS

A common theme in classrooms studied in the case study countries is the importance of establishing learning goals, tracking student progress toward those goals, and in some cases adjusting learning goals to better meet student needs. Teachers thus make the learning process more transparent. In several of the case study systems, teachers draw upon nationally or regionally-established standards for student achievement. The standards are usually broad, so teachers in the case study schools have developed more specific learning objectives and criteria by which they can judge the quality of student work. In Italy, where there are not yet nationally-defined learning standards, teachers in the case study schools have developed their own objectives and standards, and they regularly discuss teaching approaches. Teachers have found this process helpful to their own process of working through what they should expect from students.

While not a universal practice, the majority of teachers interviewed for the case studies regularly share learning goals, criteria and standards with students. Typically, the teachers share objectives for the day's lesson early in the class period (usually written on the board, and shared orally), tying the goals to earlier learning in order to place the lesson in context. They may also engage students in a discussion of what criteria for a quality piece of work should include, and may provide examples of exemplary student products.

Some teachers, however, said that they are wary of following the same format all the time – one teacher interviewed said that she sometimes waits until the end of the class to ask students, "Why did I do that?".

Teachers in the schools visited in Italy had mixed reactions to the idea of sharing criteria for performance with students. Some teachers fear that

establishing criteria might stifle students' creativity. That is, if students have a set of criteria handed to them, they might adhere to those criteria as they do their work, and might not call upon their own ideas. Teachers in England and New Zealand also had mixed reactions as to whether they should provide students with exemplars – fearing that students might hold too closely to the model without exploring the ideas for themselves. Several of the teachers agreed that it is acceptable to share exemplary work products so long as the students do not have too much time with them.

Tracking student progress

Teachers in the case study schools have found that tracking student progress is important to the formative process. At the Testoni Fioravanti school in Italy, teachers keep personalised booklets on each student's progress. In this way, they can get to know each student better and can also pass on a portrait of the student to other teachers. Teachers in several of the case study schools also keep graphs and tables to track students' acquisition of knowledge, and their ability to comprehend, analyse, synthesise, and to express themselves. They are able to compare their assessments of how students are doing with other teachers during the class council discussions. The graphs and discussions among teachers also help to ensure that they are treating students equitably.

In several of the case study schools visited, teachers have grappled with the value of providing students with marks. In most cases, they have found that if they notify parents of what they are doing and why, parents accept the new, formative approach to tracking their child's progress. Parents across several of the case study schools expressed their views that comments-only or rubric marking are actually quite helpful, and that they have a better idea of what their children are doing and how they might be able to help them with their school work. But it is not always easy to drop marks. Sometimes students still want to know how they are doing in relation to other students and parents are also interested in the relative position of their child in the school.

Adjusting learning goals

In some cases, programmes have been designed to provide teachers with greater flexibility, allowing them to adjust learning goals to better suit student needs. The Québec Ministry of Education's reform was developed to provide learners of different ability with the opportunity to learn things that they can apply in useful ways once they have left school. The idea behind the programme is that schools can reduce failure rates by ensuring that learning is more relevant to the student's needs. This has been important not

only for students at risk of failure, but also for high-achieving students. For example, a high achieving student at Sainte-Foy PROTIC programme in Québec commented that "Compared to my old school there is a lot more pride here about our work, not about grades, but about the results of what we do in the projects".

ELEMENT 3: USE OF VARIED INSTRUCTION METHODS TO MEET DIVERSE STUDENT NEEDS

Teachers across the case study schools diversify instruction to meet a variety of student needs. They ensure that lessons include a variety of approaches to explaining and helping students to understand new concepts. Teachers sometimes work together to ensure that the overall school schedule provides students with a mix of activities in each school day.

Teachers in the Maori Mainstream Programme at Waitakere College in New Zealand try to reach students with different learning styles by providing them with several options for classroom work. Students do task work the majority of the time they are in class, and the teachers are able to wander around and work with students individually. Teachers in the programme are conscious of the need to be flexible and try to use different approaches to explaining a concept, or encourage students who have done well to help fellow students.

Students at Our Lady's in Queensland, Australia, suggested that active lessons with plenty of variety of activities and in which teachers stick to the point, help them to learn. One student suggested that a good teacher is one that "doesn't put you to sleep" while they all agreed that copying off the board or out of books was least likely to help learning.

Students at Our Lady's reported that teachers give more time to those who needed help but that "brainy" people are still given time and made to think. The school leader noted that she would like to fast-track more students, and set up more opportunities for peer tutoring to ensure that diverse needs are being met.

At the Tikkakoski School in Finland, teachers set up the class schedule together. They make sure that students have at least one practical, or optional, class every day. Not all subjects are covered in every term due to the course system. The students said that they like this approach, and that they are able to concentrate better when there is variety in the schedule. The school also provides several optional courses, which students say they appreciate.

Teachers at the Tikkakoski School are able to either fast track students who are doing very well, or provide extra help for those students who need

it. Students with severe difficulties in a subject get extra help in separate classes. Students with less severe difficulties can take advantage of individual remediation instead of optional remedial courses.

ELEMENT 4: USE OF VARIED APPROACHES TO ASSESSING STUDENT UNDERSTANDING

Teachers in the case study schools use a variety of approaches to assessing student understanding. In some cases, they use the assessments diagnostically, for instance, when students first enter the school, or at specified times during the school term. During classroom interactions, however, teachers most often use questioning techniques to reveal what students understand. Students' written products also provide opportunities for teachers to assess student understanding and to enter into written dialogues with them.

Using diagnostic assessment

Teachers in several of the case study schools use diagnostic assessment to gauge each student's abilities as he or she enters the school, and at specific stages during the school year. At the Italian Testoni Fioravanti school in Bologna, students making the transition from primary to lower secondary school are asked to take diagnostic tests in a range of subjects. Teachers use test results to determine the student's level upon entry to the school. They also use a grid listing various aspects of the child's prior scholastic success, attitudes, aspirations, and habits to guide their discussions with parents. The school uses information on all incoming students to form classes that mix students by ability and personality.

At the SPF in Copenhagen, students participate in diagnosing their learning styles. At the beginning of the school year, students are introduced to basic learning theory, including Howard Gardner's concept of multiple intelligences. On that basis students write a profile that is both a self-description in relation to the multiple intelligences and a description of their expectations and goals for learning for the next two years in the school.

Questioning

While diagnostic assessments are conducted when students are entering a new school, or during specified times, teachers also assess student understanding through questioning in the normal course of teaching. They use a variety of questioning strategies.

The *types* of questions teachers ask are very important to revealing students' levels of understanding. At Lord Williams's School in England,

for example, teachers in the science department discovered that a very good task to uncover students' misconceptions was to pose a question about the direction of causality in a process they are just learning about. Teachers found, for example, that when they asked what would happen if chlorophyll stopped working that students commonly thought that all the world would be dark.

In Bologna, one teacher commented that she asks "why" questions so often that the students had started to groan when hearing this line of questioning. She persists with this approach, though, as she has found it to be a very effective method for revealing whether and how students understand the new concepts.

Techniques

Teachers across the case study schools developed a number of techniques that have been helpful in discovering what students actually understand when learning new concepts, and that give quieter students a chance to share their views. Through interaction and monitoring of student progress, teachers are better able to diagnose and respond to student needs.

The traffic light

Teachers working with King's-Medway-Oxfordshire Formative Assessment Project (KMOFAP) in England created the traffic light technique. The traffic light provides an easy way for students to indicate their understanding of a concept. At points in the lesson when teachers want to be sure that students understand a concept before moving on, they ask students to hold up a green, amber or red sign to indicate whether they understand, think they understand but are not quite sure, or do not understand at all. The traffic light has become a fairly common strategy in the schools visited in England. Teachers said that they spend more time with students showing amber, or work after class with students showing red traffic lights.

Thinking time instead of hands up

Teachers in several of the schools visited enforce a policy of "no hands up" on a fairly regular basis. Often, teachers announce that they are going to give the class a no-hands up question, but also use the more traditional technique of calling on students with raised hands during other parts of the lesson. Using this technique, the teachers pose a question, take a pause ranging from three seconds to several minutes, and then call upon a student. The teachers noted that, when they started using formative assessment techniques, giving students thinking time was perhaps one of the hardest things to get used to. However, they have found that the quality of responses improves a great deal when they are able to enforce the self-discipline of waiting upon themselves as teachers.

Continued

Portfolios, logbooks and rubrics

Portfolios and logbooks provide an opportunity for written dialogues between teacher and student. Portfolios are in fairly common use in the case study schools visited in Denmark, Canada, and to a lesser extent, in Scotland. In a portfolio or logbook, students might include the results of a project that they had enjoyed and done well on, or alternatively, that they felt had been difficult and needed more work. Students might also be asked to use the portfolio to reflect on the learning process. The portfolios are particularly useful for parents, who receive concrete information on what their children are learning, and therefore have a better basis for entering into dialogue with teachers and with their children. Parents can see for themselves some of the outcomes of students' learning and in what ways they might be able to support and encourage their children's education.

Rubrics are specific guidelines used to evaluate student work, that is, scoring tools that list criteria for a good-quality piece of work, usually on a point scale. Students in several of the case study schools use rubrics to judge the quality of their own work, and then to edit and improve it.

ELEMENT 5: FEEDBACK ON STUDENT PERFORMANCE AND ADAPTATION OF INSTRUCTION TO MEET IDENTIFIED NEEDS

Feedback combined with adaptation of instruction is an important feature across the international case studies. For example, in both Our Lady's and Woodridge schools in Queensland, Australia, there are subjects in which there is a strong emphasis on giving effective feedback through comments indicating how to improve the work.

The students interviewed at Woodridge said that teachers give them verbal feedback on written work in class. One student produced a history work booklet which was an assessed assignment with a sheet on the front giving the outcomes-based statements marked as "beginning, working toward or achieved". In addition, the teacher had given a comment indicating what would need to be done to improve the work. The Year 8 students said that grades or marks are never given and they feel that this has helped them work to their own standard and not worry about comparing themselves to other people. They all claimed to read and act upon the comments and suggested that the teacher is always willing to discuss them.

In social studies at Our Lady's, students receive comments on drafts of assessed work. The comments indicate how students can improve their work. Students are given class time to undertake the revisions. The head of science suggested that this also occurs in science and that students are more likely to read the comments on these assessed drafts than on other work.

Teachers at Rosehill College in Auckland, New Zealand noted that they plan lessons carefully in order to create time to talk with students individually during the lesson. Teachers find that they often provide the best feedback spontaneously. Other opportunities to provide feedback occur when students are working on homework. A Rosehill teacher noted that a few of his students send e-mails asking for feedback. The teacher sends back bullet points on issues to consider – which students seem to like and to use. Another teacher noted that he spends quite a bit of time talking with students about what they need to do next to reinforce their knowledge. Teachers at Rosehill commented that, rather than giving students direct feedback, they often suggest that the students research information in their textbook, look for information on the Internet, or look at exemplars produced by their peers.

ELEMENT 6: ACTIVE INVOLVEMENT OF STUDENTS IN THE LEARNING PROCESS

Teachers using formative assessment actively involve students in the learning process, with the goal of helping students to develop their own learning-to-learn skills. Teachers across the case study schools often scaffold learning, allowing students to accomplish as much as possible on their own. They also help students to build a repertoire of learning strategies, and develop skills for peer- and self-assessment.

Scaffolding learning

When teachers scaffold learning for students, they make an assessment of a student's strengths and weaknesses, and on the basis of this assessment, provide the student with an idea of how to proceed with his or her own learning. When scaffolding learning, teachers provide students with hints rather than answers, so that students have the opportunity to get to the answer themselves.

At Forres Academy, in Scotland, where most teachers use co-operative learning techniques emphasising group work, students work on problems together, and only if students don't know how to get ahead or if there is controversy about the solution to a problem, do they refer to their teacher. The teacher might point the group in the right direction, or might ask an additional question to provide students with an idea as to what they need to know in order to solve the problem on their own.

Helping students to develop a repertoire of learning strategies

The promotion of higher order thinking skills is an important goal of formative assessment. Teachers in the case study schools model approaches

to problem-solving, introduce tools such as concept maps to help students address complex concepts, and challenge students to reflect on and improve their own work.

At the Michelangelo School in Bari, students are encouraged to develop concept maps to examine the relationships between a new subject and other things they already know. At the beginning of a new unit, the students brainstorm about what they already know about a particular subject, and how it relates to other subjects they have studied. Students said that they do not study in a linear way – instead, they progress through concepts with learning models. Learning models might be textual, descriptive, analytical, or rhetorical. Students and teachers discuss the model thoroughly before starting to work on their own. Students mentioned that teachers are constantly concerned with cause and effect.

Teachers at the Michelangelo School review homework with students, correcting mistakes and guiding students toward the practice of self-correction, reflection on the work process, and review of sources. Teachers give students the opportunity to revise homework. Teachers also use test results formatively, determining what interventions are appropriate to meet students' learning needs. The teachers sometimes help students to diagnose the initial source of a misunderstanding, allowing the student to self-correct and apply these skills to new problems as well.

Building skills for peer- and self-assessment

The ultimate goal of formative assessment is for students to be able to evaluate and revise their own work. It is, as teachers at Rosehill College in Auckland noted, one of the most challenging aspects of teaching in the formative assessment mode. They hope that students will be able to find what is missing on their own, figure out what to do next, and then take responsibility for following through on next steps.

In order to instil these abilities in students, teachers at Rosehill try to model the steps, encouraging students to be specific about what their own work shows, and then taking it a step further to improve the work. The key issue, they find, is in focusing student attention on specifics relating to criteria (in checklist form) for a high quality piece of work. Teachers often try to approach this task by breaking overall learning goals into smaller goals, for example, working with students to write a perfect topic sentence. In other words, the teachers scaffold learning steps.

At the Meilhati School in Finland, teachers have developed a self-evaluation form in response to national requirements for schools to focus on students' individual development process. Students complete the form at the

end of each term, four times a year. Teachers give marks (G = good; M = moderate; T = trying and practice needed). During a course the students and teachers fill in a small questionnaire about their study habits. In grade 7 the questionnaire also asks about students' well-being in the school and in class, in grade 8, about behaviour, and, in grade 9, about attitudes toward learning. According to the teachers, students complete these self-evaluations in a realistic way. The evaluations are shared with the parents, who are then able to comment on them.

At the Tikkakoski School in Finland, teachers have also developed their own system for student self-evaluation, based on course reports. Under this system, students receive a course report at the end of each of the five seven-week terms in the school year. Students determine the grade they expect in each subject, assess their study habits and their development in learning. Concepts such as study habits and learning development are explained on the reverse side of the report. After filling in their own mark, the students receive a mark from the teacher. If there is a difference of two points or more, there is a discussion between teacher and student. For the majority of the students, however, their own grade and their teacher's grade match fairly accurately. It is likely that frequent feedback during lessons is helpful for students in gauging the level of their attainment. The course report also includes the previous assessments, enabling the student to follow his or her development over time. If, according to the course report, a student is failing in a subject, he or she is responsible for initiating a discussion with the teacher as to how to improve his or her work.

Acquiring *skills* to learn as compared to *things* to learn is also an important element of the approach to curriculum and assessment in Tikkakoski. Assessment focuses not only on student performance, but also on the development of learning-to-learn skills. Tikkakoski's system of student self-assessment therefore attempts to reflect student development. The principal and the teachers do not want to limit the concept of assessment to student performance only.

Student self-assessment is also an important goal in the two Italian schools visited. By Year 3, students are expected to have developed a relatively high level of autonomy, social skills and the ability to make functional decisions regarding their own development. The students provided some evidence that they are indeed learning to be autonomous. As one Year 3 student declared, if she does not understand a new concept, she tries to relate it to another subject in order to understand the context better, or its relation to other ideas. In other words, she develops her own learning scheme. Ultimately, this student said, "It is up to us to learn". This sentiment was widely echoed among fellow students.

Enhancing students' roles in peer- and self-assessment

Peer evaluation, including peer-feedback and peer-tutoring is a frequent practice in the case study schools visited. Peer evaluation is important because it helps to create a more dynamic learning environment, helps students to build social skills, and lays the ground for the development of self-assessment skills.

Teachers at several of the schools noted that students need careful coaching and practice if they are to provide useful assessments for their peers. Students are often quite critical of each other. Over time, however, students learn how to comment on those things they like in their peers' work, as well as offering constructive criticism. Students also develop a better sense of what they are looking for in their peers' work in order to assess quality, and pay much greater attention to criteria.

At the John Ogilvie High School in Scotland, teachers introduce criteria they have established, along with appropriate evaluative statements for oral presentations and extended writing to the new students at the beginning of the school year. Early in the year, teachers often find that student presentations are relatively poor, but that peer-assessment using the criteria works very well in helping students to improve their work.

Teachers at John Ogilvie further developed the formative assessment process by providing pupils with stick-on labels describing the different evaluative statements for judging a presentation. Students use the stick-on labels to select assessment statements for different aspects of the work presented. This helps students who are not accustomed to the "language" of assessment to choose suitable evaluative statements from a range of statements. Teachers also use a digital video camera to record classroom processes. Students are able to evaluate and comment on the recordings.

A culture of peer tutoring is clearly visible at the Xavier School in Newfoundland, Canada. Students work in pairs, supporting each other in English, mathematics and science lessons. Sometimes they are able to choose who they will work with. At other times, teachers designate which students will work together, making sure that a student who is strong in a particular subject helps another student who is not as strong.

In a grade 9 English class observed at the Xavier School, students were working on their independent research piece for their portfolio. Those who had almost completed their written assignment were given a checklist for peer editing. The teacher put students together in pairs of two. The students read each other's research pieces in turns, using the checklist and a rubric outlining criteria to improve the quality of each other's written text with regards to expression, structure, grammar and spelling. (Rubrics are scoring

tools that list criteria for a good-quality piece of work, usually on a point scale.) Most students visibly enjoy working with rubrics. As one student commented, "You can see what you did wrong and how you can fix it. It also makes it a lot easier to set aims for yourself".

Teachers across the case study schools give mixed reviews as to whether peer marking saves time, or takes time away from other activities. Some teachers said they prefer to cover as much content as possible, particularly in content-heavy subjects in the sciences, and do not want to lose time to peer-marking. Other teachers felt that it was more important to prioritise curriculum content, and perhaps cut out some units, as they prefer not to rush through the curriculum. Some teachers believed that by having students mark each other, the teachers are able to save a great deal of their own time. These teachers commented that with some practice, the quality of peer-marking is very close to that of teachers' marking.

LEARNING FROM EXPERIENCE

This chapter has examined lessons from the case study schools, looking more closely at how each of the elements of formative assessment translates into practice. As examples from the case study schools show, formative assessment requires hard work. It also requires that teachers make dramatic shifts in how they view their own roles, as well as that of their students. But effective formative assessment approaches and techniques help to discipline and make transparent the teaching and learning process. Moreover, as students gain skills for "learning to learn" and take more responsibility for their own learning, they are much more effective.

Chapter 5 will look at how teachers addressed important logistical barriers to implementing formative assessment and how school leaders guided change over time. Chapter 6 will look at how policy can promote wider and deeper changes, so that the schools in the study are no longer considered exemplary, but are actually quite commonplace.

Chapter 5
Benefits and Barriers

Teachers in the case study schools developed creative ways to address logistical barriers to formative assessment, such as large class size, and extensive curriculum requirements. Working closely with colleagues and experimenting with a variety of strategies, they were able to develop some very interesting solutions. Teachers found that formative assessment actually helped them to save time, allowed them to focus on the needs of weaker students and to incorporate varied teaching methods into their repertoire. They noticed direct benefits in their interactions with students. School leaders played an essential role in initiating, sustaining, and deepening changes. The case study schools provided anecdotal evidence of improvements in teaching and learning.

The concept of formative assessment often resonates with teachers, but many protest that it is just not possible to put these ideas into regular practice – that there are too many barriers. Secondary school teachers, in particular, may be quick to protest that it is not so easy to use formative assessment with large classes. Nor is it possible to slow the pace of instruction, particularly when trying to guide a class through important and extensive curriculum requirements. Teachers also protest that it is difficult to use formative assessment with students they consider as more challenging.

Teachers in the case study schools grappled with these challenges. Working closely with colleagues, and experimenting with a variety of strategies, they were able to develop some very interesting solutions. They found that formative assessment, instead of adding logistical challenges to teaching, actually helped them to save time, allowed them to focus on the needs of weaker students, and to incorporate varied teaching methods into their repertoire. In the process, they also found that they were making more fundamental changes in how they thought about their students' abilities, and about teaching and learning itself.

School leaders in the case study schools also played essential roles in creating conditions that allowed teachers to make significant, sustained changes in teaching and assessment. In many of the cases, they had laid the

groundwork for change over several years, building collegial cultures, and encouraging innovation. Formative assessment methods enabled these school leaders to push progress even further, focusing and giving discipline to the teachers' discussions on teaching and learning, and using data generated at classroom and school levels to inform improvements.

This chapter describes some of the specific strategies teachers in the case study schools developed as they built formative assessment into their regular practice, and how their interactions with students have changed as a result. The chapter also examines the strategies school leaders used to lead change across schools, and how these changes have contributed to overall improvements in student achievement, equity, and learning to learn skills.

ADDRESSING BARRIERS AND REALISING BENEFITS AT THE CLASSROOM LEVEL

Teachers in the case study schools developed strategies to address logistical barriers to formative assessment that were both straightforward and ingenious. They experimented with a variety of approaches before finding those that seemed to work best for them and their students. Teachers found ways to use formative assessment with larger classes, to balance extensive curriculum requirements, and to work with students they considered as more challenging. Their efforts paid off in improved interactions with students and in student work.

Class size

At the John Ogilvie High School in Hamilton, Scotland, teachers use the technique of "divided classes" in order to gain more time with individual students or with small groups of students. For example, in a mathematics class observed for the case study, the teacher kept one-half of the class busy with independent learning in the computer lab, while working through new concepts with the other half of the class. The teacher then repeated this procedure.

A significant number of teachers at Forres Academy in northeastern Scotland have been using co-operative learning techniques since the mid-1990s. The teachers commented that co-operative learning has enabled them to spend more time with individual students or with small groups of students. In classrooms featuring co-operative learning, students are encouraged to develop skills for peer-assessment, conflict resolution, leadership and teamwork. They also learn to accept others. Students are able to build cognitive and social skills simultaneously.

School leaders and teachers at the Sacred Heart School in Saskatchewan, Canada created mixed age classes to encourage peer mentoring, and to put older students' energies to positive use (thereby addressing discipline problems). Teachers are able to direct their energies differently as older students take on mentoring roles. The mixed classes also mean that teachers need to pay more attention to providing a variety of learning opportunities, and to diversifying their approaches to teaching and assessment in order to meet the different levels and needs of students in the classes. All students benefit from the wider array of choices.

Students across the case study schools were positive about peer mentoring and peer- and self-assessment that occur in co-operative learning situations. Students said that working in small groups helps them to build confidence because they are able to test out their ideas with a smaller group of peers before sharing them with the whole class or with the teacher.

Prioritising curriculum requirements

Teachers in lower secondary schools are faced with extensive curriculum requirements. In several of the case study schools, teachers prioritise curriculum requirements – deciding which concepts are most important to developing students' understanding of the subject. The teachers ensure that students have a good facility with a new concept before moving on. In some cases, this means that some curriculum items are missed, but teachers say that they are more confident that students are retaining information, and learning the subject matter in greater depth.

Changing attitudes about students' abilities

In addition to logistical barriers of classroom management, teachers may find that taking on formative assessment is difficult because it is different. Formative assessment requires that teachers change the way they interact with students, what they think about when they plan lessons, their attentiveness to students' learning differences, and even the way they think about student success.

Teachers at Rosehill College in Auckland, New Zealand said that even though they believe they have always used aspects of formative assessment (in mathematics, teachers built on previous concepts all the time in order to move forward to successive concepts), their teaching has become more effective as they have been more deliberate in their use of formative assessment. These changes include more attention to timing and specificity of feedback they provide to students, more attention to scaffolding of questions, and greater focus on students' learning-to-learn skills. They notice a difference in the quality of students' work products.

Teachers at Seven Kings High School in England noted that they have changed lesson planning to focus on what they want students to learn in the class, and what classroom set-up will create the best conditions for learning. They no longer focus simply on planning classroom activities. They interact with students more, placing emphasis on dialogue, checking for understanding, and giving students more control over their own learning processes. Teachers at Seven Kings remarked that using formative assessment approaches and techniques has made them feel differently about how students can "get from one place to another" in their learning.

Teachers in several of the case study schools noted that integrating formative assessment into their regular practice has involved a process. In some of the schools visited, teachers started using formative assessment with their best students, and with practice, realised that it would be useful and practical with weaker students, as well. Other teachers noted that they pay greater attention to underachieving students when using formative assessment approaches than they might have before.

DIRECT BENEFITS IN CLASSROOMS

Anecdotal evidence gathered in the case study schools shows direct benefits of using formative assessment in classrooms. For example:

- *Improvements in the quality of teaching.* Teachers across several of the case study schools believe that their own teaching has improved as they have developed their ability to scaffold learning goals for students and to adapt instruction to meet individual learning needs. They pay closer attention to teaching approaches that work well and put them into practice more often.
- *Stronger relationships with students and increased contact with parents.* In several of the case study schools, parents commented that they appreciated getting more specific feedback on what their children were learning, and teachers' suggestions as to how they can better support their learning. In one case study school, students commented that instead of just getting grades, they felt they were involved in a process with their teachers.
- *Different and better work products from students*. Students across the case study schools are taking more responsibility for their learning, and taking more pride in their work.
- *Greater student engagement.* Students in the case study schools are making more connections between what they are learning in class and what is happening in their lives outside of school.

Table 5.1 summarises some of the strategies teachers developed to address barriers.

Table 5.1. Teachers across the case study schools developed a variety of strategies to address barriers

Classroom level barriers to change	Strategies to address barriers
Difficulty of managing large classes or working with students teachers considered as more challenging	Divided classes to provide more time with individual students or groups of students Mixed age classes to build students' peer mentoring skills, as well as their social skills. Teachers also provide a greater range of materials and choices for learning, and scaffold learning goals to meet needs of students at different ages Co-operative learning to build students' peer mentoring and assessment skills, as well as their social skills
Extensive curriculum requirements	Prioritising curriculum requirements in order to place the greatest emphasis on core concepts
Working with students teachers consider as more challenging	Building confidence by using formative assessment with their highest performing students first, and gradually integrating new practices into more challenging classes

SCHOOL LEADERS' STRATEGIES FOR INITIATING, SUSTAINING AND DEEPENING CHANGES IN SCHOOL AND TEACHER PRACTICE

School leaders play an essential role in initiating, sustaining, and deepening changes in school and teacher practice. School leaders across the case study schools emphasised the importance of keeping the focus on teaching and learning. They actively encourage teachers to participate in innovative projects and to take risks, even with underachieving or more challenging students. They also foster school-wide cultures of evaluation, developing opportunities for teachers to provide peer feedback and support, and asking teachers to refer to objective data on the impact of teaching methods on student performance.

Keeping the focus on teaching and learning

School leaders across the case study schools emphasised the importance of keeping the focus on teaching and learning as the best route to influencing classroom change. Several, particularly those in previously low-performing schools, said that the process of change had been quite incremental, and that it had taken several years before they reached a "tipping point" where the majority of teachers were interacting regularly and sharing ideas about quality teaching and student assessment. Their

leadership has been essential to bringing staff together to discuss school priorities and in keeping issues of lower priority from distracting teachers from their main work. They have also created high expectations for teacher performance, and in turn, have been asked to meet teachers' expectations for training and support.

While school leaders in the case study schools have been strategic and focused in their efforts to lead change, they are also open to new ideas and to taking advantage of problems and learning from them. For example, the school leader at Rosehill College in Auckland, New Zealand commented that he and the school staff had "… been down blind alleys … done things wrong, and … sweated a lot". He described the process of adopting formative assessment methods throughout the school as having involved "… a lot of discussion, a lot of debate, a lot of philosophical sort of argument". As a result, members of the school staff have developed a shared language and understanding about the purpose and methods of formative assessment.

In some cases, skilled school leaders have been able to parlay unrelated initiatives into changes in approaches to teaching. For example, when a new principal came to the Sacred Heart School in Saskatchewan several years ago, the first change she introduced to the school was a complete re-organisation of playground time. After each break there had been a long line of students in front of her office, sent there because of disciplinary issues. One boy, a victim of bullying, admitted that the thing he feared most in the school was break time. In close collaboration with teachers, the new principal decided to completely restructure the school break. She replaced recess time with two breaks of 20 minutes each, spent with the class either in the gym or outside playing sports and different kinds of games the children enjoyed. The number of disciplinary incidents dropped immediately giving everyone in the school the courage to initiate and support further changes. "You notice", one teacher says, "that there is no end to innovation. You can't just change a little. Once you've made a change and you notice it works, you have to keep growing and changing".

At the Seven Kings High School in England, the head teacher used the school's reconstruction project – bringing the formerly split school site together onto one campus – as an opportunity to encourage changes in teaching and learning. The head teacher recounts that he told the teachers "We're moving, so we have to think about how we might address Religious Education differently in the future". Even for a change that ostensibly had little to do with curriculum, this school leader maintained the focus on teaching and learning.

Encouraging teachers to participate in innovative projects and to take risks

School leaders often find that they need to encourage teachers to participate in innovative projects or to take risks. In some cases, teachers are nervous about how well students will perform on external examinations. Even when new projects are grounded in research findings, teachers are reluctant to risk lower student achievement scores as they are trying out new teaching methods. In many of the cases, school leaders addressed such challenges by allowing teachers to build confidence in their use of formative assessment methods, working first with their higher achieving students, and building their own evidence that the methods are effective. Only after teachers had had a chance to build their confidence with new approaches did school leaders encourage teachers to start using methods with underachieving students.

Formative assessment approaches may also require deep changes in teachers' attitudes about what students are capable of achieving, what types of adaptation and adjustment of teaching are appropriate, and what the purposes of assessment should be. In some cases, this has to do with doubts that schools can really help disadvantaged students to close learning gaps. Other teachers may believe that equity among students is best achieved through equal treatment (that is, all students should be taught the same curriculum, in the same way), rather than a variety of treatments with the goal of achieving greater equity of student outcomes.

Building school-wide cultures of evaluation

School-wide cultures of evaluation are essential to deep change. Teachers who share a language of assessment and track what they have learnt about what works and why are able to push innovations further, and to pass on their knowledge more easily. Formative assessment facilitates this process with its emphasis on the *process* of learning and the need to carefully track student progress. Teachers working in schools with strong evaluation cultures are also able to "triangulate" data (that is, using varied assessments to confirm or challenge the conclusions), and to address potential biases in their own assessments of student performance.

In essence, teachers and schools using school and teacher self-evaluation as a way to shape future planning are using knowledge management techniques. The codification of knowledge is key to this process. A 2004 OECD report on knowledge and innovation in schools points out that:

> "Knowledge-based activities emerge when people, supported by information and communication technologies, interact in

> concerted efforts to co-produce (*i.e.* create and exchange) new knowledge. Typically, this involves three main elements: a significant number of a community's members combine to produce and reproduce new knowledge (diffuse sources of innovation); the community creates a 'public' space for exchanging and circulating the knowledge; new information and communication technologies are intensively used to codify and transmit the new knowledge." (OECD, 2004, p. 20)

The deputy head teacher at The Clere School in England described how the school-wide focus on formative assessment had helped to "… build on the experience of the teachers participating in the [initial pilot] project, reinforced things they were doing instinctively and put a label on it. That helped to clarify and categorise their methods. … Then, they were asked to look at the difference these methods made in student learning". The project also helped to deepen teachers' understanding of how they could enhance student learning by meeting students at their level of development.

School leaders and teachers in several of the case study schools regularly refer to data as they develop school plans. Since 2001, schools in Newfoundland and Labrador have been developing action plans based on the provincial test results. At the Seven Kings High School, in the east London Borough of Redbridge, the school leader noted a dramatic change from past school practices, commenting that schools used to "let a thousand flowers bloom". No one looked at data to see if innovations were actually working or not. Now, data are regularly used in the development of school strategies.

Because teachers are engaged in the learning process along with students, they sometimes find it difficult to make objective observations and judgments while teaching. They may pay as much or more attention to the success of the instruction process as they do to student outcomes or other evidence of student learning (Airasian and Abrams, 2003) that provides information on how they may need to adapt teaching methods. Even if teachers can automatically predict performance of their students with reasonable accuracy, it helps to have their views confirmed by the data.

There are potential biases in classroom-based assessments. For example, teachers may vary in their interpretation and application of the same performance criteria – either among themselves, or with different students or classes (Kellaghan and Madaus, 2003). They may also develop impressions regarding students early in the year based on incomplete information, or stereotypes. For example, teachers are more likely to give high marks to students who are more like themselves. Alternatively, teachers may make negative judgements of students from different cultural backgrounds, or with different communication styles. Teachers' personalities and characteristics,

or varying expectations of different students, may also influence student performance (Airasian and Abrams, 2003).

Teachers in the case study schools address potential biases by working closely with peers. For example, at the Statens Pædagogiske Forsøgscenter School (SPF) in Denmark, teachers discuss the interpretation of student results in teams and how they can be more objective. As one teacher commented, "one sees what one wants to see". These teachers noted that the quality of their assessments has improved as they have worked with other teachers to bring potential biases to light.

Creating opportunities for peer support and observation

Teachers also benefit from observation and feedback when they are making fundamental changes to their teaching practice. The support of peers and school leaders – or at a minimum, of professional networks – is essential to making deep and sustained changes in approaches to teaching. Teachers in several of the case study schools said that working together on student assessment has helped them to develop more collegial cultures and deepened their understanding of those elements most important to formative assessment. In several of the case study schools, teachers participate in training opportunities on formative assessment as a group, or regularly take opportunities to observe each other.

School leaders have taken several approaches to creating opportunities for teachers to observe each other. At Waitakere College in New Zealand, the school supports a half-time mentor who regularly observes teachers participating in the Maori Mainstream (*Te Kotahitanga*) pilot programme, providing feedback and suggestions for improvement. The teachers participating in the programme meet regularly to discuss their own experiences. At Seven Kings High School in England, the school is investing in an observation lab, where teachers are videotaped and have the opportunity to analyse their own teaching.

SCHOOL-WIDE BENEFITS

As noted earlier in this study, a number of case study schools have moved from failing to exemplary status. Such dramatic changes in school performance required time, dedication, creativity, and the willingness to take risks. The case study schools have realised school-wide benefits as they have implemented formative assessment in departments and across schools. Anecdotal evidence of the benefits includes:

- *Improved "learning to learn" skills.* Teachers at the PROTIC programme in Québec said that students show a genuine knowledge

of the learning process and share the language of formative assessment with teachers. Teachers at the Michelangelo School in Bari reported that, by their third year at the school (age 14), students are fairly independent, are able to draw relations between new concepts and what they have learnt previously, and are trying to understand the context of new concepts better. In other words, the students are developing individual learning schemes.

- *High value-added.* In the 2001-02 school year (the year prior to the case study visit), the Seven Kings High School in England was recognised as having achieved the second highest value-added in the country. A large percentage of the student population at Seven Kings High School belongs to special needs categories, such as English as an additional language, refugee status, disability, and/or eligibility for free lunch. School leaders at Rosehill College in Auckland, New Zealand, noted that their students are achieving the same or better results as students from schools with higher socio-economic status student populations. At Rosehill, school leaders also noted that high standards have been maintained, in spite of evidence that the writing and reading abilities and the attitudes of incoming students are declining. This suggests that teaching and learning programmes are helping students to close learning gaps effectively.

- *Increased student retention and attendance.* The Maori Mainstream Programme at Waitakere College in Auckland, New Zealand, pointed to better retention and attendance rates as a major advance.

- *Gains in academic achievement, and greater attention to the weakest students*. Teachers at the Xavier School in Newfoundland say that they are able to pay greater attention to the weakest students and are seeing improved learning outcomes for these students. Results from the English case study schools show student achievement gains in externally mandated tests. Researchers from King's College, London noted that the results from departments participating in the project, if replicated across a whole school, would "… raise the performance of a school at the 25th percentile of achievement nationally into the upper half"'. (Wiliam *et al.*, 2003) Other case study schools point to improved results in ministerial tests, including the PROTIC programme in Québec, and Rosehill College in Auckland, New Zealand.

Table 5.2 summarises some of the strategies school leaders developed to address barriers.

Table 5.2. School leaders across the case study schools developed strategies to initiate, sustain and deepen change

School level barriers to change	Strategies to address barriers
Difficulty of influencing classroom level change	Keeping the focus on teaching and learning Encouraging professional development Encouraging peer support
Lack of innovation or risk-taking with new methods	Using problems as learning opportunities Parlaying unrelated initiatives into changes in approaches to teaching Taking advantage of pilot projects, partnerships with universities
Negative attitudes about student capabilities	Allowing teachers to build confidence in their use of formative assessment before using new methods with lower achieving students
Teacher isolation	Creating opportunities for peer support and observation in classrooms and in videotapes and observation laboratories
Difficulty of sustaining change	Focusing attention on data regarding the impact of teaching practices Developing and disciplining teachers' skills for innovation and creating fertile ground for change

ADDRESSING CHALLENGES AND SUSTAINING INNOVATIONS

Teachers and school leaders in the case study schools worked hard to address logistical barriers to using formative assessment in their classrooms. They found creative ways to address barriers to practice. Evidence from case study schools shows that they realised direct benefits in their interaction with students, improvements in the quality of their own teaching, and in the quality of student work.

However, it is important to note that deeper, sustained changes across schools required longer periods of time, skilful leadership, and the careful building of collegial cultures. In some cases, the schools taking on formative assessment were at the "tipping point" – that is, they were ready to take on formative assessment quite quickly and to see significant benefits, including high value-added, and overall gains in achievement. In several of the cases, teachers were participating in special projects and innovations, and thus benefited from extra resources and support.

There is the danger that the effect of special projects will wear off over time, and that teachers will be unable to sustain changes. However, there are at least three reasons to expect that formative assessment, when applied systematically, will have longer staying power within schools. First, when schools develop cultures of evaluation and regularly refer to data regarding the impact of teaching practices, they are more likely not only to sustain innovations, but also to take them further. Second, while schools in the case studies may have benefited from special attention and extra resources during the initial implementation phases of a pilot project, they are also developing their facility to innovate, and are preparing the ground for further change. Third, as demonstrated in Chapter 2, countries that have a strong mix of policies promoting the practice of formative assessment can use multiple strategies to support school level change.

The case study schools' experiences show that deep and sustained changes entail focused and strategic efforts within schools. Spreading formative assessment on a broader basis will require strong policy leadership and significant investments in capacity-building and opportunities to innovate. The next chapter suggests how policy can better ensure wider and deeper practice of formative assessment.

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Chapter 6
Policy Implications

Policy can do more to encourage and facilitate wider practice of formative assessment. Building on findings of the "What Works" case studies and international literature, the chapter proposes policy principles to encourage wider, deeper and more sustained practice of formative assessment.

This study set out to examine promising practices in formative assessment across several OECD countries. The case studies and international literature reviews informing this analysis show that formative assessment is much more than a set of best practices; teachers using formative assessment change the culture of their classrooms.

Each of the countries participating in this study, as discussed in Chapter 2, has policies to promote the wider practice of formative assessment. Yet, policy can do more to encourage and facilitate wider practice of formative assessment. This chapter outlines policy principles of formative assessment to promote wider, deeper and more sustained practice. The policy principles, which are explored at greater length in the following pages, are to:

1. Keep the focus on teaching and learning.
2. Align summative and formative assessment approaches.
3. Ensure that data gathered at classroom, school and system levels are linked and are used formatively
4. Invest in training and support for formative assessment.
5. Encourage innovation.
6. Build stronger bridges between research, policy and practice.

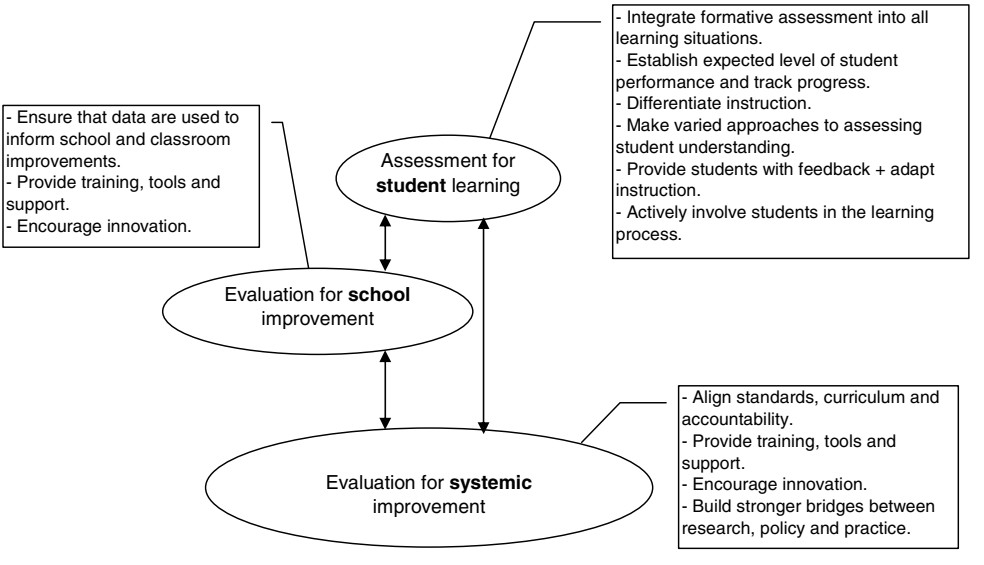
The aim of these principles is to ensure that the schools included in this study are no longer considered exceptional, but are representative of common practice.

POLICY PRINCIPLE 1: KEEP THE FOCUS ON TEACHING AND LEARNING

At the policy level, a strong focus on teaching and learning means that policy leaders and officials send consistent messages about the importance of quality teaching and student assessment, of adapting teaching to meet a diversity of student needs, and of promoting students' skills for "learning to learn". This does not mean that policy should provide detailed guidance on what is to happen in classrooms – far from it. Rather, policy focused on teaching and learning should recognise complexity, be concerned with the *process* of learning, and look to a broad range of indicators and outcome measures to better understand how well schools and teachers are performing.

A strong focus on teaching and learning at the policy level is essential to each of the remaining principles.

Figure 6.1. Coordinating the elements of formative assessment



Keep the focus on teaching and learning

Note: Education stakeholders can use information to shape improvements at every level of the system. Teachers use formative assessment to improve teaching and learning. Policy and school leaders can also support teaching and learning through encouragement of innovation, investments in training and ongoing professional development, and the development of tools to support formative assessment. Policy can also help to build stronger bridges between research, policy and practice.

Source: Authors.

POLICY PRINCIPLE 2: ALIGN SUMMATIVE AND FORMATIVE ASSESSMENT APPROACHES

Data gathered in both summative and formative processes are vital to understanding whether individual schools – and systems – are meeting goals for high-achievement, high equity, and lifelong learning. Yet, as noted throughout this study, misalignment of standards, curriculum and accountability approaches present major barriers to the effective practice of formative assessment.

In addressing tensions between tests used for school accountability, and classroom-based formative assessments, policy officials will need to consider the need for multiple measures of student progress to ensure stronger validity and reliability of measures. Multiple measures of student progress lessen the pressure on teachers and students to perform well on a single, high-visibility test, and help to avoid well-known socio-economic, gender and cultural biases of large-scale tests.

Tests and other measures of student progress also need to be well-designed. Tests that stress recall or recognition of factual information, as opposed to critical thinking and analytical abilities, exacerbate the tendency for teachers to engage in "drill and kill" exercises (Kellaghan and Madaus, 2003).

Improving alignment of summative and formative assessment

At the most basic level, alignment means that education stakeholders ensure that policies do not compete with each other. At a more sophisticated level, the elements of formative and summative assessment reinforce each other. Well-designed standardised tests, inspection systems or school-based evaluations can measure students' ability to reason and apply knowledge to new situations. Information on student performance gathered through more sophisticated approaches to assessment and evaluation can help shape strategies at the systemic, school and classroom levels.

The first and possibly most important step in addressing these challenges is to ensure that standardised tests measure students' reasoning skills, their understanding of key concepts, and ability to develop strategies for addressing problems. Policy may also encourage the development of measurements for other important aspects of education, such as student motivation, or ability to work well in teams – an important skill for lifelong learning.

Second, teachers will likely need to be convinced that using formative assessment will lead to equal or better student performance. Policy leaders and officials may need to make a concerted effort to share the results of studies that show the positive impact of using formative assessment if they

are to convince teachers that summative and formative assessments are not inherently at odds.

As noted previously, several of the case study schools achieved good or outstanding results on external examinations, have received outstanding reviews from inspectorates, or have done particularly well when results are viewed in terms of "value-added". Teachers in these schools were perhaps unusual in their willingness to take risks and to use innovative teaching methods, but their example may be useful to other teachers integrating formative assessment into their practice.

Finally, policy can ensure that school and teacher performance are judged not only on the results of tests or school inspections, but on a wider range of measures, such as student motivation, ability to work in groups, and so on. Policy officials, school leaders and teachers will have much richer sets of data on which to base their strategies for improvement.

POLICY PRINCIPLE 3: ENSURE THAT DATA GATHERED AT CLASSROOM, SCHOOL AND SYSTEM LEVELS ARE LINKED AND ARE USED FORMATIVELY, TO SHAPE IMPROVEMENTS AT EVERY LEVEL OF THE SYSTEM

Assessments and evaluations on student and school performance are of little consequence if the data are not used. At the school level, this means strengthening evaluation cultures. At the policy level, this means better linking assessment and evaluation at the classroom, school and system levels.

Strengthening evaluation cultures in schools

Schools that have strong evaluation capabilities are able to identify patterns and trends in school performance, and to develop a sophisticated understanding of the school and the viewpoints of various stakeholders. It is important to note, however, that there are also several potential barriers to effective school-based evaluation:

- School leaders and teachers often lack training in the art of data gathering and analysis (which involve different skills than those used in classroom assessment). A lack of understanding regarding the purposes and uses of evaluation may lead to unevenness in data gathering, poor use of evidence, or the development of unsupported conclusions (Monsen, 2002; Simmons, 2002).
- Evaluation tools may be more suited to needs of policy makers who have introduced them than they are to schools and teachers,

who have needs for different types of information (Lander and Ekholm, 1998).

- External pressure on schools to conduct self-evaluation can take away schools' intrinsic motivation and feelings of control over the process of evaluation, or may even be seen as bureaucratic interference and a challenge to their professionalism (Monsen, 2002).

- School-based evaluation may face competition from new initiatives, obligations and time commitments. Teachers often complain that school-based evaluation is time consuming and does not relate to their classroom obligations (although it should be noted that teachers are willing to spend the time needed to gather information on pupil learning). School leaders and teachers may also have a tendency to see evaluation as a discrete project with a beginning and an end, rather than as an ongoing commitment (Monsen, 2002).

Several OECD countries support school-based evaluation either as the primary or only form of school-level evaluation, or as a complement to external testing, inspections and evaluation. Policy can take important steps to strengthening evaluation cultures in schools by addressing barriers and better linking assessment and evaluation at systemic, school and classroom levels.

School leaders and teachers are likely to need training in order to use data addressing concerns of school management. When schools are able to make useful connections between what's happening in classrooms and at the school level, school staff are better able to understand the implication of data for the classroom, as well as longer-term strategic concerns facing schools.

The practice of classroom-based formative assessment can help teachers to develop greater facility with data analysis. With training and experience, teachers and school leaders are better able to complement external evaluation with knowledge of local conditions and contextual issues, and by improving interpretation and usefulness of external findings (Glassman and Nevo, 1988). In turn, local evaluators may very likely be more receptive to using external data for school improvement if local conditions are recognised. Certainly, as communities become more diverse, it is important that evaluations consider their viewpoints and values in the interpretation of data (Nevo, 2002).

Linking classroom, school and systemic assessment and evaluation

Policies that link a range of well-aligned and thoughtfully developed assessments at the classroom, school and system levels will provide stakeholders with a better idea as to whether and to what extent they are achieving objectives. Policy and school leaders and teachers will have a sound basis on which to make improvements, and will broaden teaching as well as policy repertoires.

Formative assessment, when applied at each level of the system, means that all education stakeholders are using assessment for learning. Policy often ignores classroom level variables, to its detriment. As Reynolds (1998) points out, the greatest variations in student learning occur not among schools, but within schools, among subject departments and individual teachers. This implies that it is more important to focus on classroom variables than on school variables. Policy has much to learn by looking "inside the black box" of classroom practice.

POLICY PRINCIPLE 4: INVEST IN TRAINING AND SUPPORT FOR FORMATIVE ASSESSMENT

Policy can support school leaders and teachers in improving teaching and formative assessment through investments in effective teacher training and ongoing professional development and extra support for pilot programmes to test new ideas and approaches to formative assessment. Policy can also support the development of guidelines, and tools such as rubrics and exemplars, to aid the assessment process.

Invest in effective teacher training and ongoing professional development

Teacher training and professional development are key strategies for improving teaching and bringing change to schools. In the majority of OECD countries, national education ministries or departments have influence over the curriculum for initial teacher training, and standards for teacher certification. Policy officials in these countries have an ideal opportunity to provide teacher trainees with the knowledge and skills necessary for student assessment, and the ability to respond to identified student learning needs with a broad repertoire of approaches and techniques. Effective training in formative assessment requires more than adjustments to the teacher training curriculum, however. When possible, policy should encourage the practice of formative assessment in schools of education, as well. University professors should model formative assessment techniques

in their own teaching, and sponsoring schools should provide student teachers with opportunities to test the methods they are learning about during student teaching.

Teachers already in the workforce also need opportunities to participate in professional development programmes and to test out new ideas and methods. Effective professional development can be expensive, however. Policy officials may need to analyse the impact of investments in different schools with an eye toward developing effective and cost-efficient professional development strategies in the future. Policy can provide guidance to individual schools as to how professional development funds (often a combination of national and school level investments) are best spent.

In addition to training in formative assessment, teachers and school leaders can benefit from training in the use of data generated at the school and system levels, and in the use of research data (addressed in more detail below).

Develop appropriate tools to encourage formative assessment

Teachers need ways to translate abstract ideas – such as child-centred learning – into concrete practice. Vague or purely conceptual programmes are unlikely to get far or to last very long – particularly since teachers are busy with ongoing pressures and demands on their time. Teachers benefit from having access to exemplars and tools that help them to incorporate information gathered during the teaching process into their practice. Several of the national governments in the case study countries, as discussed in Chapter 2, provide tools, such as rubrics and forms to track student progress, exemplars, and guidelines to help teachers examine the substance of their lessons.

POLICY PRINCIPLE 5: ENCOURAGE INNOVATION

Many teachers may need explicit "permission to innovate". Teachers are often wary of developing or implementing new approaches and techniques to use with their students for fear of failure (including poor results on external tests or school inspections, upset parents, or other bad results). This is not unreasonable given teachers' frequent experience with the "implementation dip" (that is, student results go down before they improve) (Fullan, 2001).

Giving teachers permission to innovate means that policy and school leaders alike actively encourage teachers to take risks and to try new things (albeit, disciplined by careful attention to evidence of effectiveness) and have a level of tolerance for anticipated implementation dips. Policy and school leaders can encourage innovation on an everyday basis (not solely on centrally sponsored projects) by fostering and encouraging confident teachers, and encouraging peer support and cooperation with researchers.

Policy can also encourage innovation through support for pilot projects, although it should also ensure that pilot projects are not scaled up until their impact has been fully evaluated and the implementation challenges are well understood. Several of the schools included in this study have participated in pilot or other special projects before deciding to adopt formative assessment teaching methods. Their participation in these projects helped to prepare the ground for further change, and created a culture of risk-taking and interest in new and different ways of doing things. As participants in special projects, teachers have also, in many cases, received additional professional development opportunities, and occasionally, have benefited from additional resources. While, as noted in Chapter 5, there is the danger that the energy for special projects will disappear over time, schools that develop cultures of evaluation and regularly refer to data are more likely to sustain those approaches that work.

POLICY PRINCIPLE 6: BUILD STRONGER BRIDGES BETWEEN RESEARCH, POLICY AND PRACTICE

Policy can encourage the building of stronger bridges between research, practice and policy by: investing in training for research literacy for practitioners, as well as policy officials; developing "best-practice" databases and centres to catalogue and disseminate the results of research; and, investing in support for further research. Formative assessment may be particularly conducive to building stronger links among these stakeholders – as researchers may also participate in the formative feedback loop.

In several of the case studies, teachers partnered with university-based researchers to strengthen teaching methods. Working together, trained researchers and teachers in several of the case study schools have developed rigorous analyses of the impact of approaches to assessment, and adaptation of teaching. But schools with these strong connections were the exception rather than the rule. Ideally, policy will encourage and support the development of more university-school partnerships. At the very least, policy can strengthen the capacity of practitioners to draw upon research findings, and of researchers to develop more "user-inspired" research (that is, research that takes user-needs and the demands of the teaching and learning process into account) (OECD, 2002). School leaders and teachers can also build their research literacy and skills in gathering evidence.

Most countries place some emphasis on identifying and sharing best-practice. It is important to ensure that practices included meet carefully-chosen criteria for quality teaching and student assessment, discuss the conditions under which practices are most effective and useful to teachers, and present information in a way that is useful to teachers. Some countries

also disseminate videos of best practice to ensure that teachers have a real opportunity to see what innovations look like in practice.

Investments in further research

While there is evidence that formative assessment methods have a significant impact on student learning, there is a need for further research. Future research may address:

- **The impact of formative assessment on general student achievement**. While there is convincing evidence that formative assessment is indeed highly effective in raising levels of student achievement (see Black and Wiliam, 1998; Natriello, 1987; Crooks, 1988), the research should be extended and strengthened. Further research in this area may include both quantitative and qualitative studies of formative methods, drawing upon a breadth of international educational experiences.

- **The relative impact of formative assessment methods for underachieving students**. Several studies show that formative assessment methods have an even stronger impact for underachieving students. Selected studies focus on teaching which stresses the importance of effort over ability, or of task-centred feedback (as opposed to ego-involving feedback). These studies show relatively stronger improvements for previously underachieving students. Further research in this area may have significant implications for teachers working with larger groups of underachieving students or in "failing" schools.

- **Effective formative approaches for students based on gender, ethnicity, socio-economic status, or age**. As noted earlier in this study, there is a need for more refined knowledge of what works for students in different socio-economic or demographic groups. Research in this area may explore the differential impact of methods on diverse learners. For example, research may explore the circumstances under which different students thrive on competition, or in more co-operative situations. Research may also explore the extent to which principles of teaching that work well for a defined group, such as the Maori Mainstream Programme (*Te Kotahitanga*) included in this study, transfer to other groups of students. Studies in this area may prove extremely important to addressing long-term challenges of closing equity gaps in student achievement.

- **Connections between students' emotions and learning**. The connections between positive emotions and improved learning are a major theme of neuro-scientific research on learning. This research, along with work in the area of educational psychology, can inform studies on the impact of different formative methods on student emotions, motivation, self-perceptions and achievement.

- **The expansion of teacher repertoires to meet identified student needs**. As noted earlier, if teaching is limited, the quality of student assessment will also be limited. Teachers need a healthy repertoire of approaches to setting up learning situations and responding to student learning needs. Teachers and researchers may form a healthy partnership for research in this area. Formative assessment requires greater transparency in teaching and learning, and is also quite iterative. The approach is ideal for researchers who want to explore the process of teaching and learning in normal classroom settings. Teachers using formative assessment may also draw upon research to further build their repertoires.

- **The challenges of deepening and broadening practice of effective formative assessment approaches and techniques**. This study has asserted that formative assessment methods are more than a passing fad. Still, there are important challenges to deepening and broadening practice of effective formative assessment methods and techniques. Researchers should pay careful attention to the success of various dissemination and implementation strategies. Policy, in the formative spirit, can draw upon this knowledge to adapt and improve strategies and deepen impact.

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PART III. THE LITERATURE REVIEWS