Assessment for Learning Around the World

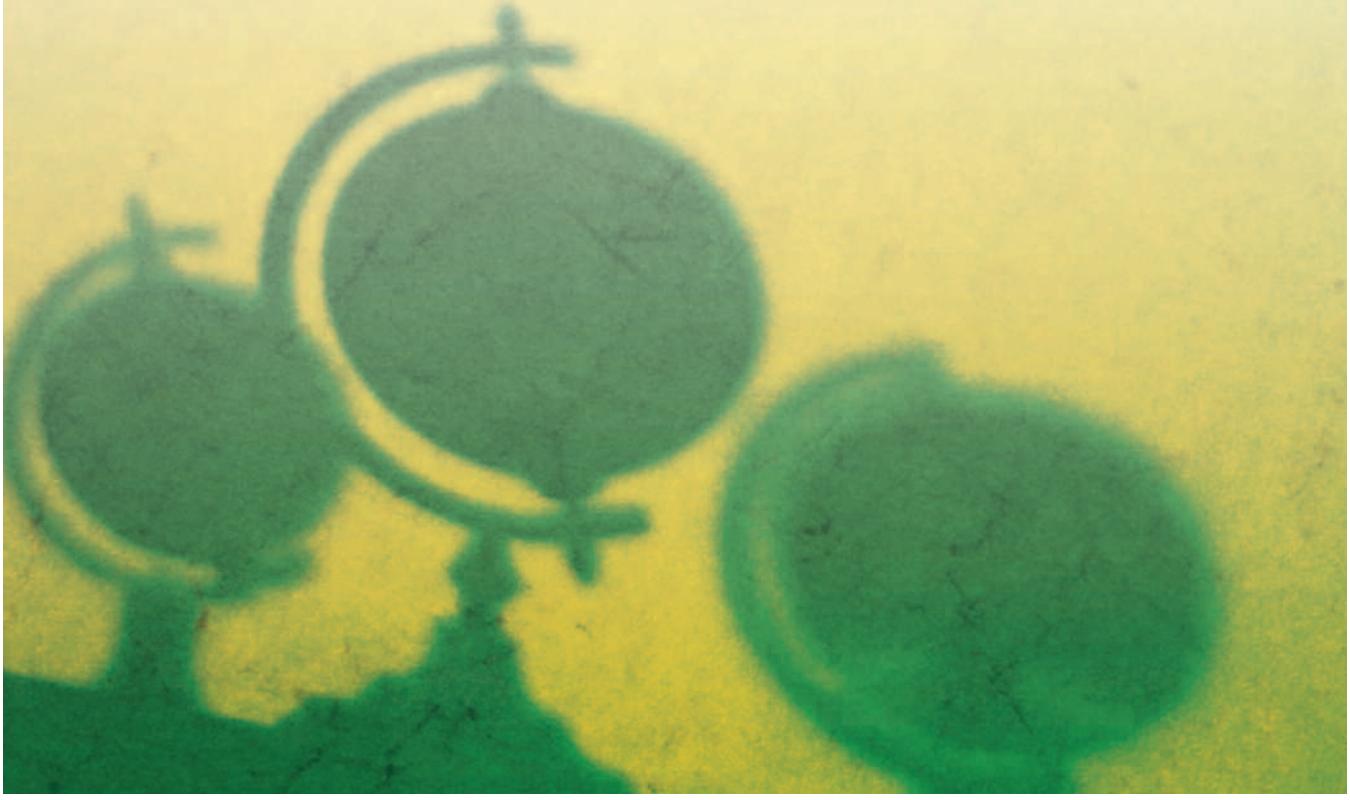
WHAT WOULD IT MEAN TO BE INTERNATIONALLY COMPETITIVE?

High-performing nations integrate curriculum, instruction, and assessment to improve both teaching and learning.

BY LINDA DARLING-HAMMOND AND LAURA McCLOSKEY

Since the release of *A Nation at Risk*, the U.S. has launched a set of wide-ranging reforms with the intention of better preparing all children for the higher educational demands of life and work in the 21st century. All 50 states have developed standards for learning and tests to evaluate student progress. No Child Left Behind reinforced using test-based accountability to raise achievement, yet the U.S. has fallen further behind on international assessments of student learning since the law was passed in 2001.

On the Program in International Student Assessment (PISA) tests in 2006, the U.S. ranked 35th among the top 40 countries in mathematics and



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31st in science, a decline in both raw scores and rankings from three years earlier.[1] (Reading scores were not reported, because of editing problems with the U.S. test.) Furthermore, in each disciplinary area tested, U.S. students scored lowest on the problem-solving items. The U.S. also had a much wider achievement gap than the most highly ranked jurisdictions, such as Finland, Canada, Australia, New Zealand, Hong Kong, Korea, and Japan.

Policy discussions in Washington often refer to these rankings when emphasizing the need to create more "internationally competitive" standards by benchmarking expectations in the U.S. to those in high-performing nations. Typically, this means looking at topics that are taught at various grade levels in various countries. These analyses reveal that higher-achieving countries teach fewer topics more deeply each year; focus more on reasoning skills and applications of knowledge, rather than mere coverage; and have a more thoughtful sequence of expectations based on developmental learning progressions within and across domains.[2]

However, we must examine *how* these topics are taught and assessed — so that we understand how other countries' education systems shape what students actually learn and can do. European and Asian nations that have steeply improved student learning have focused explicitly on creating curriculum guidance and assessments that focus on the so-called 21st-century skills: the abilities to find and organize information to solve problems, frame and conduct investigations, analyze and synthesize data, apply learning to new situations, self-monitor and improve one's own learning and performance, communicate well in multiple forms, work in teams, and learn independently.

Curriculum differences are reinforced by sharp divergence between the forms of testing used in the U.S. and those used in higher-achieving countries. Whereas U.S. tests rely primarily on multiple-choice items that evaluate recall and recognition of discrete facts, most high-achieving countries rely largely on open-ended items that require students to analyze, apply knowledge, and write extensively. Furthermore, these nations' growing emphasis on project-based, inquiry-oriented learning has led to an increasing prominence for school-based tasks, which include research projects, science investigations, development of products, and reports or presentations about these efforts. These assessments, which are incorporated into the overall examination scoring system, influence the day-to-day work of teaching and learning, focusing it on the development of higher-order skills and use of knowledge to solve problems.

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Smaller countries often have a system of national standards that are sometimes — though not always — accompanied by national tests in the upper grades. Top-ranking Finland uses local assessments almost exclusively in order to evaluate its national standards and manages a voluntary national assessment at only one grade level. Larger nations — like Canada, Australia, and China — have state- or provincial-level standards, and their assessment systems are typically a blend of state and local assessments. Managing assessment at the state rather than national level, where it remains relatively close to the schools, turns out to be an important way of enabling strong teacher participation and ensuring high-quality local assessments that can be moderated to ensure consistency in scoring.

In many cases, local assessments complement centralized "on-demand" tests, constituting up to 50% of the final examination score. Tasks are mapped to the standards or syllabus for the subject and are selected because they represent critical skills, topics, and concepts. They are often outlined in the curriculum guide, but they are generally designed, administered, and scored locally, based on common specifications and evaluation criteria. Whether locally or centrally developed, decisions about when to undertake these tasks are made at the classroom level, so they are used when appropriate for students' learning process and teachers can get information and provide feedback as needed, something that traditional standardized tests cannot do. In addition, as teachers use and evaluate these tasks, they become more knowledgeable about both the standards and how to teach to them and about their students' learning needs. Thus, the process improves the quality of teaching and learning.

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drivers in the U.S., these performance assessments evaluate what students can actually *do,* not just what they know. The road test not only reveals some important things about drivers' skills, preparation for the test also helps *improve* those skills as novice drivers practice to get better. In the same way, performance assessments set a standard toward which everyone must work. The task and the standards are not secret, so teachers and students know what skills they need to develop and how they will need to be demonstrated.

Finally, these countries do not use their examination systems to rank or punish schools or to deny diplomas to students. Following the problems that resulted from the Thatcher government's use of test-based school rankings, which caused a narrowing of the curriculum and widespread exclusions of students from school,[3] several countries enacted legislation precluding the use of test results for school rankings. High school examinations provide information for higher education, vocational training, and employment, and students often choose areas in which they will be examined, as a means of demonstrating their qualifications. Because the systems are focused on using information for curriculum improvement, rather than sanctions, governments can set higher standards and work with schools to achieve them, rather than devising tests and setting cut scores at a minimal level to avoid dysfunctional side effects.

Many states in the U.S. — including Connecticut, Kentucky, Maine, Nebraska, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Wyoming — have developed and used state and local performance assessments as part of their testing systems. Indeed, the National Science Foundation provided millions of dollars for states to develop such hands-on science and math assessments as part of its Systemic Initiative in the 1990s, and prototypes exist all over the country. Studies have found that using such assessments has improved teaching quality and increased student achievement, especially on tasks that require complex reasoning and problem solving.[4] However, these assessments have been difficult to sustain, especially under NCLB's annual testing requirements, because the policy community has little understanding about how systems of assessment for learning might be constructed and managed at scale.

The U.S. can learn a great deal by examining the assessment systems of several high-achieving education systems: two of the highest-achieving Scandinavian nations — Finland and Sweden — plus a group of English-speaking jurisdictions that have some shared approaches to assessment, as well as some interesting variations — Australia, Hong Kong, and the United Kingdom. In particular, we can learn from how assessments in those nations are linked to curriculum and integrated into the instructional process to shape and improve learning for students and teachers alike.

FINLAND AND SWEDEN

Finland has been a poster child for school improvement since it rapidly climbed to the top of international rankings after emerging from the Soviet Union's shadow. Finland now ranks first among all OECD nations on the PISA assessments in mathematics, science, and reading. Finland attributes these gains to intensive investments in teacher education —

all teachers receive three years of high-quality graduate-level preparation completely at state expense — plus major overhaul of the curriculum and assessment system. Most teachers now hold master's degrees in both their content and in education, and their preparation is aimed at learning to teach diverse learners — including special needs students — for deep understanding. Preparation includes a strong focus on how to use formative performance assessments in the service of student learning.[5] Sweden also invests heavily in state-funded graduate teacher education for all teachers and relies on a highly trained teaching force to implement its curriculum and assessment system.

Over 40 years, both Finland and Sweden have shifted from highly centralized systems emphasizing external testing to more localized systems using multiple forms of assessments. Around 1970, Sweden abolished its nationally administered exit exam that ranked upper secondary students and placed them in higher education programs.[6] Finland followed suit, and both nations stopped tracking students into different streams by their test scores, offering a common core curriculum to all students. These changes were intended to equalize educational outcomes and provide more open access to higher education.[7]

Although it may seem counterintuitive to Americans accustomed to external testing as a means of accountability, Finland's leaders point to its use of school-based, student-centered, open-ended tasks embedded in the curriculum as an important reason for the nation's extraordinary success on international exams.[8] Policy makers decided that if they invested in very skillful teachers, they could allow local schools more autonomy to decide what and how to teach — a reaction against the highly centralized system they sought to overhaul. Finland's national core curriculum is a much leaner document, reduced from hundreds of pages of highly specific prescriptions to descriptions of a small number of skills and core concepts each year. (For example, about 10 pages describe the full set of math standards for all grades.) This guides teachers in collectively developing local curricula and assessments that encourage students to be active learners who can find, analyze, and use information to solve problems in novel situations.

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Finland has no external standardized tests to rank students or schools. Finnish education authorities periodically evaluate school-level samples of student performance, generally at the end of the 2nd and 9th grades, to inform curriculum decisions and school investments. Local educators design and manage all

SWEDISH ASSESSMENTS

Swedish assessments use open-ended, authentic tasks asking students to demonstrate content knowledge and analytic skills in grappling with real-world problems. This sample question from a 5th-grade exam asks students (aged 11-12) to think through a problem that they might have in their own lives:

> Carl bikes home from school at four o'clock. It takes about a quarter of an hour. In the evening, he's going back to school because the class is having a party. The party starts at 6 o'clock. Before the class party starts, Carl has to eat dinner. When he comes home, his grandmother calls, who is also his neighbor. She wants him to bring in her post before he bikes over to the class party. She also wants him to take her dog for a walk, then to come in and have a chat. What does Carl have time to do before the party begins? Write and describe below how you have reasoned.[1]

Upper secondary exams also frame challenging questions in real-world terms, with the expectation that students will show their work and reasoning. For example:

> In 1976, Lena had a monthly salary of 6,000 kr. By 1984, her salary had risen to 9,000 kr. In current prices, her salary had risen by 50%. How large was the percent change in fixed prices? In 1976, the Consumer Price Index (CPI) was 382; in 1984, it was 818.[2]

Students who experience a steady diet of such challenging assignments, which require thoughtful reasoning and the ability to communicate their thinking, are well-prepared for the kinds of problem solving required in the real world.

1. Astrid Petterson, *The National Tests and National Assessment in Sweden* (Stockholm: PRIM gruppen, 2008), www.prim.su.se/artiklar/pdf/Sw_test_ICME.pdf.

2. Max A. Eckstein and Harold J. Noah, *Secondary School Examinations: International Perspectives on Policies and Practice* (New Haven, Conn.: Yale University Press, 1993), pp. 270-72.

other assessments. The national core curriculum provides teachers with recommended assessment criteria for specific grades in each subject and for the final assessment of student progress each year.[9] Schools then use those guidelines to craft more detailed learning outcomes and curricula at each school, along with approaches to assessing curriculum benchmarks.

The national standards emphasize that the main purpose of assessing students is to guide and encourage students' own reflection and self-assessment. Consequently, ongoing feedback from the teacher is very important. Teachers give students formative and summative reports both through verbal feedback and on a numerical scale reflecting the students' levels of performance in relation to curriculum objectives. The teachers' reports must be based on multiple forms of assessment, not only exams.

Finland uses assessments to cultivate students' active learning skills by asking open-ended questions and helping students address these problems. In a Finnish classroom, teachers rarely stand at the front of a classroom lecturing students for 50 minutes. Instead, students are generally engaged in independent or group projects, often choosing tasks to work on and setting their own targets with teachers, who serve as coaches.[10] The cultivation of independence and active learning encourages students to develop analytical thinking, problem-solving, and metacognitive skills.

Before attending university, most Finnish students take a voluntary matriculation exam that asks students to apply problem-solving, analytic, and writing skills.[11] Teachers use official guidelines to grade matriculation exams locally, and samples of the grades are re-examined by professional raters hired by the Matriculation Exam Board.

Similarly, Sweden implements its nationally outlined and locally implemented curriculum with multiple assessments managed at the school level. Each school adapts a national curriculum and subject matter syllabi to local conditions.[12] Teachers design and score school-based assessments based on objectives outlined in each syllabus, and they assign grades based on syllabus goals and national assessment criteria. They are expected to meet with every student and parent each term to discuss the student's learning and social development, and they use a number of diagnostic materials to assess students' learning in Swedish, Swedish as a second language, English, and mathematics in relation to goals set by the syllabi.[13]

Schools offer nationally approved examinations in these same subjects in 9th grade and in the upper secondary years, where additional subject exams are available.[14] Teachers work with university faculty to design the tasks and questions, and they weight information from these exams, their own assessments, and classroom work to assign a grade reflecting how well students have met the objectives of the syllabus.[15] Regional education officials and schools provide time for teachers to calibrate their grading practices to minimize variation across the schools and across the region.[16] Toward the end of their upper secondary schooling, Swedish students receive a final grade or "learning certificate" in each area that acts as a compilation of all of these sources of evidence, including projects completed by the student as well as grades awarded for courses.

AUSTRALIA, THE UNITED KINGDOM, AND HONG KONG

Unlike such smaller countries as Finland and Sweden that have national curricula, in the much larger Australia each state has its own curriculum and assessment system. Australia's only national assessment is a periodic, matrix-sample-based assessment, similar to the National Assessment of Educational Progress in the U.S. In most Australian states, local school-based performance assessment is a well-developed part of the system. In some cases, states have also centralized assessment with performance components. The two highest-achieving states, Queensland and A.C.T., have the most highly developed systems of local per-

formance assessment. Victoria, which uses a blended model of centralized and school-based assessment, also generally performs well on national and international tests.

Queensland, Australia. Queensland has had no external assessment system for 40 years. All assessments became school-based when the traditional "post-colonial" examination system was eliminated in the early 1970s, about the same time as in Finland and Sweden. Teachers develop, administer, and score school-based assessments in relation to the national curriculum guidelines and state syllabi (also developed by teachers). Panels that include teachers from other schools and university professors also moderate the assessments.

The syllabi spell out a few key concepts and skills to be learned in each course and the projects or activities (including minimum assessment requirements) that students should engage in. Each school designs its program to fit the needs and experiences of its own students, choosing specific texts and topics with this in mind. At year's end, teachers use a five-point grading scale to grade each portfolio of student work, which includes specific assessment tasks. To calibrate these grades, teachers assemble a selection of portfolios from each grade level — one from each of the five score levels, plus borderline cases — and send these to a regional panel for moderation. A panel of five teachers rescores the portfolios and confers about whether the grade is warranted. A state panel also looks at portfolios across schools. Based on these moderation processes, the school is instructed to adjust grades so they are comparable to others.

Queensland's "New Basics" and "Rich Tasks" approach to assessment, which began in 2003, offers extended, multidisciplinary tasks developed centrally but used when teachers determine the time is right and they can be integrated with locally oriented curricula. They are "specific activities that students undertake that have real-world value and use, and through which students are able to display their grasp and use of important ideas and skills."[17] Rich Tasks are defined as:

> a culminating performance or demonstration or product that is purposeful and models a life role. It presents substantive, real problems to solve and engages learners in forms of pragmatic social action that have real value in the world. The problems require identification, analysis, and resolution, and require students to analyze, theorize, and engage intellectually with the world. As well as having this connectedness to the world beyond the classroom, the tasks are also rich in their application: they represent an educational outcome of demonstrable and substantial intellectual and educational value. And, to be truly rich, a task must be transdisciplinary. Transdisciplinary learnings draw upon practices and skills across disciplines while retaining the integrity of each individual discipline.

The science and ethics task summarized on the left illustrates these traits.

A bank of these tasks now exists across grade levels,

SCIENCE AND ETHICS CONFER

Students must identify, explore, and make judgments about a biotechnological process to which there are ethical dimensions. Students identify scientific techniques used, as well as significant recent contributions to the field. They will also research frameworks of ethical principles for coming to terms with an identified ethical issue or question. Using this information, they prepare preconference materials for an international conference that will feature selected speakers who are leading lights in their respective fields.

In order to do this, students must choose and explore an area of biotechnology where ethical issues are under consideration and undertake laboratory activities that help them understand some of the laboratory practices. This enables them to:

A. Provide a written explanation of the fundamental technological differences in some of the techniques used, or of potential use, in this area (included in the preconference package for delegates who are not necessarily experts in this area).
B. Consider the range of ethical issues raised in regard to this area's purposes and actions, as well as scientific techniques and principles, and present a deep analysis of an ethical issue about which there is a debate in terms of an ethical framework.
C. Select six real-life people who have made relevant contributions to this area and write a 150-200 word précis about each one indicating his or her contribution, as well as a letter of invitation to one of them.

This assessment measures research and analytic skills; laboratory practices; understanding biological and chemical structures and systems, nomenclature and notations; organizing, arranging, sifting through, and making sense of ideas; communicating using formal correspondence; précis writing with a purpose; understanding ethical issues and principles; time management, and much more.

along with scoring rubrics and moderation processes by which the quality of the tasks, the student work, and the scoring can be evaluated. Research indicates the system has supported school improvement. Studies have found stronger student engagement in learning in schools using the Rich Tasks. On traditional tests, New Basics students scored about the same as students in the traditional program, but they performed notably better on assessments designed to gauge higher-order thinking.

The Singapore government has employed the developers of the Queensland system to focus its new school improvement strategies on performance assessments. High-scoring Hong Kong has also begun to expand its already ambitious school-based assessment system in collaboration with Queensland assessment developers.

Victoria, Australia. In Victoria, a mixed system of centralized and decentralized assessment combines school-based assessment practices with a set of state exams. Guided by the Victoria Essential Learning Standards, the AIM assessment program indicates how well students' literacy and numeracy skills are developing at grades 3, 5, 7, and 9. Assessment tasks include extended open-ended writing tasks, as well as some multiple-choice responses.

The Victoria Curriculum and Assessment Authority (VCAA) establishes courses in a wide range of studies, develops external examinations, and ensures the quality of the school-assessed component of the Victoria Certification of Education. VCAA conceptualizes assessment as "of," "for," and "as" learning. Teachers, along with university faculty, develop assessments, and all prior year assessments are public in order to make the standards and means of measuring them as transparent as possible. Before students take the external examinations, teachers and academics take the exams themselves, as if they were students. The external subject-specific examinations, given in grades 11 and 12, include written, oral, and performance elements scored by classroom teachers.

In addition, at least 50% of the total examination score consists of classroom-based tasks given throughout the school year. Teachers design these required assignments and assessments — lab experiments and investigations on central topics, as well as research papers and presentations. These classroom tasks ensure that students have the kind of learning opportunities that prepare them for assessments, that they are getting feedback to improve, and that they will be prepared to succeed not only on these very challenging tests but in college and in life, where they will have to apply knowledge in these ways.

An example of how this blended assessment system works can be seen in the interplay between an item from the Victoria, Australia, biology test and the classroom-based tasks also evaluated for the examination score. The open-ended item describes a particular virus and how it operates, then asks students to design a drug to kill the virus and explain how the drug operates (the multi-page written answer is to include diagrams), and then asks students to design and describe an experiment to test the drug. In preparation for this on-demand test, students taking biology will have been assessed on six pieces of work during the school year covering specific outcomes in the syllabus. For example, they will have conducted "practical tasks," such as using a microscope to study plant and animal cells by preparing slides of cells, staining them, and comparing them in a variety of ways, resulting in a written product with visual elements. They also will have completed and presented a research report on characteristics of pathogenic organisms and mechanisms by which organisms can defend against disease. These tasks link directly to the expectations that students will encounter on the external examination but go well beyond what that examination can measure in terms of how students can apply their knowledge.

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The tasks are graded according to criteria set out in the syllabus. The quality of the tasks assigned by teachers, work done by students, and the appropriateness of the grades and feedback given to students are audited through an inspection system, and schools receive feedback on all of these elements. In addition, the VCAA uses statistical moderation to ensure that the same assessment standards are applied to students across schools. External exams are used as the basis for this moderation, which adjusts the level and spread of each school's assessments of its students to match the level and spread of the same students' scores on the common external test score. The result is a rich curriculum for students with extensive teacher participa-

tion and a comparable means for examining student learning.

United Kingdom. As in Victoria, assessments in Great Britain use a combination of external and school-based tasks based on the national curriculum and course syllabi. Throughout the school years, classroom-based tasks scored by teachers are used to evaluate student achievement of curriculum goals. At age 7, students take open-ended, nationally developed assessments in English and math that are scored by teachers in the school; at age 11, similar tests in English, math, and science are marked externally. At age 14, there was once a set of national exams to supplement teacher-created and administered assessments. Those external exams were abolished in October 2008, leaving only the teacher-developed assessments.[18]

While not mandatory, most students take a set of exams at year 11 (age 16) to achieve their General Certificate of Secondary Education (GCSE). Students may take as many single-subject or combined-subject assessments as they like, and they choose which ones they will take based on their interests and areas of expertise. Most GCSE items are essay questions. The math exam includes questions that ask students to show the reasoning behind their answers, and foreign language exams require oral presentations. About 25% to 30% of the final examination score is based on coursework and assessments developed and graded by teachers. In many subjects, students also complete a project worked on in class that is specified in the syllabus.

Wales and Northern Ireland allow students to participate in the GCSE exams at the high school level on a voluntary basis, but both broke from the more centralized system introduced in England under the Thatcher administration (later modified during the Blair administration as described above) and opted to abolish national exams.[19] Much like Finland and Sweden, Welsh schools during the primary years have a national school curriculum supported by teacher-created, administered, and scored assessments.[20] Northern Ireland, which has recently climbed significantly in international rankings, especially in literacy, is implementing "Assessment for Learning." This approach emphasizes locally developed, administered, and scored assessments and focuses, as in Finland, on students and teachers setting goals and success criteria together, teachers asking open-ended questions and students explaining their reasoning, teachers providing feedback during formative assessment sessions, and students engaging in self-assessment and reflection on their learning. Optional externally graded assessments also focus on how students reason, think, and problem solve.[21]

Hong Kong. In collaboration with educators from Australia, the UK, and other nations, Hong Kong's assessment system is evolving from a highly centralized examination system to one that increasingly emphasizes school-based, formative assessments that expect students to analyze issues and solve problems. The government has decided to gradually replace the Hong Kong Certificate of Education Examinations, which most students sit for at the end of their five-year secondary education, with a new diploma that will feature school-based assessments. In addition, the Territory-wide System Assessment (TSA), which assesses lower-grade student performance in Chinese, English, and mathematics, is developing an online bank of assessment tasks to enable schools to assess students and receive feedback on their performance on their own timeframes. The formal TSA assessments, which include both written and oral components, occur at primary grades 3 and 6 and secondary grade 3 (the equivalent of 9th grade in the U.S.).

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As outlined in Hong Kong's "Learning to Learn" reform plan, the goal of the reforms is to shape curriculum and instruction around critical thinking, problem solving, self-management skills, and collaboration. A particular concern is to develop metacognitive thinking skills, so that students may themselves identify strengths and areas needing additional work.[22] By 2007, curriculum and assessment guides were published for four core subjects and 20 elective subjects, and assessments in the first two subjects — Chinese language and English language — were revised. These became criterion-referenced, performance-based assessments featuring not only the kinds of essays previously used on the exams, but also new speaking and listening components, the composition of written papers testing integrated skills, and a school-based component that factors into the examination score. Although existing assessments already

use open-ended responses, the proportion of such responses will increase in the revised assessments.

As they do with existing assessments, teachers develop the new assessments with the participation of higher education faculty, and teachers who are trained as assessors score them. Tests are allocated randomly to scorers, and essay responses are typically rated by two independent scorers.[23] Results of the new school-based assessments are statistically moderated to ensure comparability within the province. The assessments are internationally benchmarked, through the evaluation of sample student papers, to peg results to those in other countries.

CONCLUSION

The design and use of standards, curricula, and assessments in high-achieving nations around the world are significantly different from the way tests are designed and used in the U.S. Most testing in the U.S. emphasizes externally developed, machine-scored instruments that enter and leave the school in secret, offering little opportunity for teacher engagement with the evaluation of standards and little opportunity for student production of analyses, solutions, or ideas.

By contrast, assessment abroad involves teachers in developing and scoring intellectually challenging performance tasks that are embedded in and guide instruction, providing grist for feedback, student self-evaluation, and learning. The integration of curriculum, assessment, and instruction in a well-developed teaching and learning *system* creates the foundation for much more equitable and productive outcomes. Teachers and students come to understand the standards deeply, and they work continuously on activities and projects that develop skills as they are applied in the real world, as well as on the examinations themselves.

The tasks common in these assessment systems reflect what people increasingly need to know to succeed in today's knowledge-based economy: the abilities to find, analyze, and use information to solve real problems; to write and speak clearly and persuasively; to defend ideas; and to design and manage projects. While U.S. accountability efforts have focused on achieving higher test scores, they have not yet developed the kind of teaching and learning systems that could develop widespread capacity for significantly greater learning. A new vision for assessment will be critical to this goal — and to the possibilities of success for our children in today's and tomorrow's world.

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Catherine Ruf, Director of Office Operations 9-9-08