



The Gordon Commission
on the Future of Assessment in Education



Work in Progress

ISSUE

#1

Work in Progress – Issue #1

Work in Progress provides periodic briefings concerning the ongoing work of The Gordon Commission on the Future of Assessment in Education. The Commission has been created to investigate and advise on the nature and use of educational assessment in the 21st-century.

The scholars, policymakers and practitioners who comprise the Commission are identifying critical issues concerning educational assessment, investigating those issues, and developing position and review papers that will inform the Commission's recommendations for policy and practice in educational assessment. We're focusing, in particular, on the development of frameworks that will best leverage educational assessment to inform and improve teaching and learning processes, as well as outcomes.

Through its commitment to influencing the future of assessment in education, the Commission seeks to stimulate a national conversation on possible relationships between assessment, teaching and learning. Toward that end, the Commission consults with a wide variety of experts, ranging from consumers of tests and test results, to research and development scholars who produce tests and knowledge relevant to assessment, as well as policymakers who determine the broad importance and application of tests.

For the past 50 years, some of us have debated the merits of psychological assessment or criticized the limits of extant theories, practices, instruments and procedures. The field of psychometrics has responded with growth in conceptualization, its capacity to serve and the scope of its concerns. Still, the persistent, implicit question has been raised: "What makes you think that scholarship applied to this set of issues will make a difference when

such debate has not radically changed the field in 50 years?" Our knowledge base has changed. Our theories have become more complex. Our instrumentation is more sophisticated. But it is the judgment of some that educational assessment has not kept pace with changes in educational policy and practice, and there are many signals indicating that our culture and its demands on education will continue to change.

Some argue that the expectation of such shifts and changes in our beliefs and realities will require us to transform what we do in, through and with education. Educational assessment will need to be responsive to these changed conditions. Some of us believe that assessment in education can inform and influence the nature of the conditions and processes that are the foci of assessment.

Our major tasks are to anticipate how the field of education will respond to these evolving changes and to think about how the field of assessment in education can become adequately responsive to our nation's future needs and practices in education. We begin with an assumption that assessment in education can inform and improve teaching and learning processes and outcomes.



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The Activities of the Commission

1. Consultative Conversations

The Gordon Commission spent much of its first year gathering and synthesizing information and perspectives concerning the state of the art and sciences of educational measurement and assessment. The chairman and members of the Commission have held individual consultations with experts around the country who provide input into the work and the direction in which the Commission is going. During 2011, the Commission hosted more than a dozen consultative conversations with groups that advised us on the identification of issues that need to be addressed and the substance of the issues to be considered:

Issues to be addressed by the Commission

Harvard University (Boston, MA - March 24, 2011)

Political and Social Contexts for Education

Teachers College, Columbia University (New York, NY - April 11, 2011)

Issues to be addressed by the Commission

The CEJES Institute (Pomona, NY - April 25, 2011)

Issues to be addressed by the Commission

Stanford University (Palo Alto, CA - May 2, 2011)

Issues to be addressed by the Commission

University of Washington (Seattle, WA - May 4, 2011)

Issues to be addressed by the Commission

University of Pittsburgh (Pittsburgh, PA - May 9, 2011)

Social and Emotional Learning

University of Illinois at Chicago (Chicago, IL - August 31, 2011)

Science and Technology

McArthur Foundation (Chicago, IL - September 1, 2011)

Meetings with Practitioners

Alliance for Excellent Education (Washington, D.C. - September 15-16, 2011)

Issues related to Policy

Teachers College, Columbia University (New York, NY - October 25, 2011)

Changing Epistemologies

Teachers College, Columbia University (New York, NY - November 15, 2011)

Data Management Systems

UCLA (Los Angeles, CA - November 29, 2011)

Human Diversity, Excellence and Equity in Education

Howard University (Washington, D.C. - December 15, 2011)

The Commission has been charged with a threefold mission:

- study the best of educational assessment policy, practice and technology;
- consider our best estimates of what education will become and what will be needed from educational measurement during the 21st century; and to
- generate recommendations on educational assessment design and application that meet and/or exceed the demands and needs of education — present and predicted.

Our goals are to:

- inform the field and the public about the need and possibilities for change in education, as well as change in the place and functions of assessment in education;
- increase public awareness and knowledge about assessment as an integral component of education and the possibilities for change in assessment practice;
- encourage the field of educational assessment to strengthen its capacity to factor into measurement practice; attention to the reciprocal influences of human attributes, social contexts, and personal identities, on human performance;
- balance the emphasis on prediction, selection, and accountability with an equal concern for informing and improving teaching and learning processes and outcomes; and
- inform long-term planning and product development in the field of psychometrics.

2. Knowledge Synthesis Project

The Knowledge Synthesis Project includes the work of leading scholars whose analyses and syntheses of extant scholarship will be used to inform the deliberation of the members of the Commission as the findings and recommendations of the Commission are formulated. This work is represented in two dozen commissioned papers that are being written as a part of our Knowledge Synthesis Project:

Education: Constraints and Possibilities in Imagining: New Ways to Assess Rights, Duties and Privileges

Author: Hervé Varenne

Consulting Editors: Diane Ravitch and Robert Wise

Four Metaphors You Need to Understand Assessment

Author: Robert Mislevy

Consulting Editors: James Pellegrino and Lorrie Shepard

Changing Paradigms for Education in 21st Century USA

Authors: Edmund W. Gordon, E. Wyatt Gordon, John Lawrence Aber, and David Berliner

Consulting Editors: James Greeno and Carl Kaestle

Epistemology in Measurement – Part I. A Critical Perspective on the Sciences of Measurement

Authors: Ezekiel Dixon-Roman and Kenneth Gergen

Consulting Editors: David Hansen, Elena Silva, and Lee Shulman

Epistemology in Measurement – Part II. Social Epistemology and the Pragmatics of Assessment

Authors: Kenneth Gergen and Ezekiel Dixon-Roman

Consulting Editors: David Hansen, Elena Silva, and Lee Shulman

Democracy, Meritocracy and the Uses of Education

Authors: Aundra Saa Meroe and Edmund W. Gordon

Consulting Editors: Freeman Hrabowski, Irving Hamer, and Lucius Outlaw

Toward an Understanding of Assessment as a Dynamic Process of Pedagogy

Authors: Eleanor Armour-Thomas and

Edmund W. Gordon

Consulting Editor: Randy Bennett

Assessment as Evidential Reasoning

Author: Joanna Gorin

Consulting Editors: Robert Mislevy and Lauren Resnick

Assessment in the Service of Teaching and Learning

Author: Clifford Hill

Consulting Editors: Michael Martinez and Randy Bennett

Toward A System of Examinations for Education in the USA

Author: Lauren Resnick

Consulting Editors: Lynn Kagan and Randy Bennett

Cultural Identity, Existential State and the Measurement of Human Performance

Author: Rodolfo Mendoza-Denton

Consulting Editors: Kenji Hakuta and Charlene Rivera

Human Diversity, Assessment in Education, and the Achievement of Excellence and Equity

Author: Wade Boykin

Consulting Editors: Charlene Rivera, Kenji Hakuta, and Pedro Noguera

Accommodation for Challenge, Diversity and Variance in Human Characteristics

Author: Martha Thurlow

Consulting Editors: Robert Linn, Ross Weiner, and Timothy Shriver

The Intersection Between Academic Social and Emotional Learning (ASEL) and Academic Achievement

Authors: Norris Haynes, Roger Weisberg, and Ernest Washington

Consulting Editors: Lawrence Aber and Constance M. Yowell

What Will It Mean to Be an Educated Person in the Mid-21st Century?

Authors: Carl Bereiter and Marlene Scardamalia

Consulting Editors: Carl Kaestle, Ernest Washington, and Freeman Hrabowski

Variety in the Functions and Purposes of Assessment in Education

Author: Andrew Ho

Consulting Editors: James Pellegrino and Howard Everson

The Possible Relationships Between Human Behavior, Human Performance, and Their Contexts

Authors: Edmund W. Gordon, Emily Campbell, and Paola Heincke

Consulting Editors: Michael Cole, Ana Marie Cauce, and John Lawrence Aber

Toward the Relational Management of the Data of Educational Measurement

Author: Greg Chung

Consulting Editors: Eva Baker, Pat Forgione, and Michael Nettles

Toward the Measurement of Human Agency and the Disposition to Express It

Authors: Ana Marie Cauce and Edmund W. Gordon

Consulting Editors: James Greeno and Michael Martinez

Leverage Points for “Natural” Digital Activities in the Assessment of Human Attributes.

Authors: John T. Behrens and Kristen DiCerbo

Consulting Editors: Eva Baker, James P. Gee, and Constance Yowell

Toward a Culture of Educational Assessment in Daily Life

Author: Michael Nettles

Consulting Editors: Constance M. Yowell and Lee Shulman

Content Mastery, Mental Process Command, and Transfer Facility as Indicators of Intellectualive Competence and Targets of Measurement

Author: David Pearson

Consulting Editor: John Bransford

Assessment of Content and Language on the Heels of the New Standards: Challenges and Opportunities for English Language Learners

Author: Kenji Hakuta

Consulting Editors: Charlene Rivera and Patricia Gandara

New Standards Project Lessons Learned

Authors: David Wall Rice and Donovan Ramsey

Consulting Editor: Carl Kaestle

Models for the Management and Mining of Educational Assessment Data

Authors: Jose Coronado and Edmund W. Gordon

Consulting Editors: Anthony Bryk and Pascal Forgione

What Won't Change: Perennial Imperatives in Educational Assessment

Author: Randy Bennett

Consulting Editors: TBA

The Future of Assessment in a Globalized World

Author: Eva Baker

Consulting Editors: TBA

Visions of Educational Measurement Designed to Predict, Account, and Inform Teaching and Learning Processes and Outcomes

Authors: Eva Baker, Randy Bennett, Edmund W. Gordon, Paola Heincke, Louis Gomez, Bob Mislavy, James Pellegrino, Lauren Resnick, and Lorrie Sheppard

Consulting Editors: TBA

3. Exploration of Developments in Science, Technology and Scientific Imagination

Under the auspices of the Gordon Commission on the Future of Assessment in Education, the Arizona State University Center for Games and Impact, the ASU Center for Science and the Imagination, and the Carnegie Mellon Project on Working Examples (funded by the MacArthur Foundation and the Gates Foundation), we will sponsor two concurrent symposiums in the fall of 2012: 1) The Perils and Possibilities of Emerging Technologies for Learning and Assessment, and 2) Science and Imagination – The Future for the Teaching, Learning and Assessment We Want and How to Get There.

The two symposiums will be run together. One asks us to think about the emerging future of teaching, learning and assessment and how we can shape it towards possibilities for paradigm change and avoid the perils of reproducing our traditional grammar of schooling, especially in an age of growing inequality. The other project asks us to imagine the longer-term future we want and how we could make it happen, not in terms of abstractions, but in terms of what might actually exist and happen in such a future. This latter project asks us to liberate ourselves from the taken-for-granted assumptions that a sole focus on the near future often brings, and seeks to leverage contributions from all areas and domains, from fiction to science. There will be significant overlap in the

people in the two projects and significant cross-talk between them.

Symposium 1: The Perils and Possibilities of Emerging Technologies for Learning and Assessment

Digital technologies are available now, or soon will be, that have the capacity to transform learning, education, and assessment. Things like data mining, badges (or certificates), adaptive technologies, artificial agents, emotional sensors, smart tools for collective intelligence, augmented reality, gamification, search tools, powerful tools for representation and model building, and all sorts of social and interactive media for new forms of organization for learning are already having major impacts on business and out of school learning, though less in school.

These are all “low-hanging fruit” impeded as much or more by the culture of schooling than by technological problems. All these emerging technologies, and more, have the capacity to re-enact the grammar of schooling as we know it, transform it totally, or have some other desirable or undesirable outcomes. This project will discuss emerging technologies in the context of how we can put them to the best uses for the most people in the service of vision for schools and society in the modern world.

Among other things, we will use Working Examples (a platform designed at Carnegie Mellon and supported by the MacArthur Foundation and the Gates Foundation) to resource our discussion of the future just about to grow, for better or worse, and how we can tend its growth in desirable directions. Working Examples are sketches of a concrete practice in learning, education, or assessment that its author supports and wants to advocate for. This will help focus the discussion not on critique of what is wrong, but on concrete proposals of what could be right and good.

Symposium 2: Science and Imagination: The Future for the Teaching, Learning and Assessment We Want and How to Get There

In our rush to leverage “low-hanging fruit” in education, we often allow our interventions to get captured by the grammar of the present and not possibilities for a better future. Our institutions and

lives are full of taken-for-granted assumptions and inertia from the past and from political roadblocks.

This project is about letting the imagination free to image, in as concrete terms as we can, the long-term future we want and how we might make it happen over the long haul. This project is about “high-hanging fruit” and what the arts, humanities, social sciences, and hard sciences have together to offer for “imagineering” a better, more equitable future for all learners across the globe. How can learning, education, and assessment address the long-term needs for human growth and survival in a world filled with risky complex systems and seriously unaddressed educational problems?

Among other things, we will use “design fictions” to resource our discussion of makeable futures. Design fictions are concrete images of something that can capture a view of what a desired and possible future might look like. Twenty years ago, a fictional iPad® might have been just such a design fiction and we could have imagined what it would portend and what it could do for learning, education, and assessment. We can ask, now that iPads are actually around, has the future we would have imagined and desired come to pass?

4. Excellence and Equity Project

This study group is charged with the tasks of exploring the challenges in and the opportunities for the conjoint pursuit of excellence and equity in the academic achievement of all categories of students, through the assessment, teaching, and learning transactions in which students engage. In the agreement by which the Gordon Commission was funded, we were asked to give special attention to the problems posed for assessment by the concern for the concurrent privileging of the pursuit of excellence and equity in academic opportunity and achievement. Through this project, the Commission seeks to honor that agreement.

One of the commissioned papers in the Knowledge Synthesis Project is directed at this question. Professor A. Wade Boykin has agreed to write that paper. He has been advised by a consultative conversation recently held at Howard University. In addition, a small study group is in the process of being organized to give extended discussion to this

set of problems. The Study Group will explore such issues as:

- Tensions in the assignment of responsibility for differentials in assessment outcomes between opportunity to learn, adequacy of the assessment probe, and effort by the performing person.
- Conditional correlates of human performance related to tensions between cultural identities and hegemonic cultural practices and attributes assigned to context.
- What issues require attention when assessing the relationship between diversity and excellence/equity in education?
- What challenges are posed by shifts in the populations being assessed and advances in the technologies that are emerging, while the criteria by which excellence is judged are changing?

5. Public Policy

Given the centrality of assessment to both improving the quality of American education and maximizing its equitable accomplishments across diverse populations, policy construction and implementation are regarded by the Commission as an essential tool in a repertoire of educational improvement strategies. Moreover, rather than relying on episodic and geographically bounded approaches to effective assessment, well-formulated policies have the power to transcend and affect American education broadly.

Yet, wise assessment policies will not emerge without careful consideration and strategic planning. The policy initiative is concerned with converting the findings and recommendations of the Commission into workable, policy-amenable positions that will productively and durably alter the nature of educational assessment and the educational landscape in the United States.

Together with the Gordon Commission Pre- and Post-Doctoral Fellows, the Policy Initiative will advise the Commission on matters of policy, and generate for the Commission draft policy statements for consideration by the members of the Commission. These draft statements will likely concern themes from the work of the Commission such as those that follow:

- Righting the balance in assessment instrumentation and procedures to give more equal emphasis to the multiple purposes of assessment in education (accountability, diagnosis, prediction, prescription, and documentation), and informing and improving teaching and learning.
- Wider use of multicomponent and multipurpose systems of assessment, distributed over time and embedded in teaching and learning transactions.
- Exploration of the capacities for accessing information, for analysis and management of data, for monitoring performance, for mining data and for experiential simulation that reside in cyberspace.

6. Communication

Early in the life of the Gordon Commission, we were asked, “Why should we expect that the application of more intelligence to the problems of assessment will change the field, when such emerging knowledge has not radically changed the field in the past 50 years?” In another consultation, we were advised that the field of psychometrics may be more ready to change than is the field that it serves, and that it may be that assessment instruments and procedures will not change until the fields that they serve change. Such observations as these have led us to give serious attention to:

- Communication designed to influence the context out of which the demand for assessment grows;
- The development of our capacity to facilitate communication among members of the Commission; and
- The development of the capacity to communicate with the educational assessment communities of research and development, policy, and practice.

A bifocal program of communication is the result. As part of the internal communication plan, the Commission has created a Wiki page and a blog to be used for Commission members as a working site for document sharing, discussions, live chat, and video conferencing. All of the commissioned papers in progress and resource materials can be accessed via the Wiki page by members of the Commission. External communications are directed at three target audiences: practitioners and policymakers;

students and parents; and the psychometric research and development community. The external communications plan includes:

- Creation of a website where selected materials are available to the general public;
- Development of a bi-monthly bulletin, *Assessment, Teaching, and Learning*, which is the Chairman's vehicle for keeping the public informed concerning the work of the Gordon Commission, and for stimulating a national conversation concerning the relationships between assessment, teaching and learning;
- Production of social-marketing materials for parents and students to raise the level of consumer understanding of how assessment can improve teaching and learning;
- Use of webinars for information dissemination and the provision of continuing professional development to policymakers and practitioners;
- Hosting of public hearings and forums with key stakeholders to ensure access to the Commission by persons in the field; and
- Use of regular and social media for the dissemination of strategic messages to target audiences.

Chairman's Reflection

Assessment, as we know it in education today, is in large measure a product of 20th-century thinking, and has been greatly influenced by conceptions of the educability of individuals and of the functions of education that had currency at the end of the 19th and beginning of the 20th centuries. At that time, the prevailing thinking in education and psychology was guided by such beliefs as the fixed nature of intelligence and the limited educability of low-status populations such as recent immigrants and the descendants of enslaved persons. Assessment technologies privileged efficiency, veridicality, precision, objectivity, and decontextualization. These views also were influenced by the limited

opportunities for schooling that existed in that era, and the limited need for advanced levels of education in order for individuals to fulfill their responsibilities as productive members of society.

The functions of assessment were thus generally limited to classification, prediction, and sorting. The principal functions of education were thought to be the transfer of knowledge, skills, and values to those thought to be capable of benefiting from instruction. Early instrumentation was designed to select those more likely to be educable. By the end of the 20th century, however, educators and the general public began to be confronted with important research-based notions from the field of psychology that were directly relevant to pedagogy. These included the view of intellect as a developed ability and the related idea of intellect as a capacity modifiable by education. With the realization that most human beings are educable came social and economic phenomena that in turn influenced pedagogy: the almost universal demand for high levels of intellectual competence in most spheres of life, and, ultimately, the conceptualization of education as a civil right to which all of the nation's people are entitled.

These changes have confronted the field of educational assessment with new challenges. Beyond such functions as classification, prediction, and sorting, assessment is increasingly being called upon to complement and serve more transformative ideas concerning education. By the end of the 20th century, assessment was under heavy pressure to serve the purpose of governmental effort at greater accountability. At the same time, some of us were asserting that educational assessment also should be the principal vehicle for advancing the processes of teaching and learning. Despite the current strong emphasis on accountability and on the sorting function that continues to be imposed on assessment, I predict that the educational assessments of the future will be increasingly concerned with the improvement of teaching and learning as its principal purpose. I think that the assessment industry of the future will be concerned with testing primarily as it serves and advances education. Assessment in education will be directed primarily at the improvement of the development of intellectual competence. This view is in the tradition of the brilliant young educational

psychologist Michael Martinez, who wrote the book *Education as the Cultivation of Intelligence* (2000); or from the perspective of the distinguished cognitive psychologist Robert Sternberg, who titled one of his many books *Teaching for Successful Intelligence: To Increase Student Learning and Achievement* (Sternberg & Grigorenko, 2007). An earlier exponent of these ideas was the eminent developmental psychologist James McVicker Hunt, whose book *Intelligence and Experience* (Hunt, 1961) challenged the fields of both education and psychometrics to deal with the mutability of intelligence. These and other scholars influenced my colleague Dr. Beatrice Bridglall and me in the development of a work titled *The Affirmative Development of Academic Ability: In Pursuit of Social Justice* (Gordon & Bridglall, 2007). In this work, we demonstrate that academic ability is not so much an aptitude as it is a developed ability. Academic ability is a specialized ability developed as the result of exposure to special experiences — special cultures — associated with schooling and reinforced by experiences with literate, problem-solving, technology-utilizing adults and peers. (Cole & Scribner, 1974).

In such a conceptual climate, educational tests in the future will fall into disuse, unless they are capable of effectively supporting a range of pedagogical functions, such as:

1. The diagnosis of what it is possible through teaching and learning. In clinical psychology, we once spoke of “testing the limits” to determine what kinds of performances are evoked under different conditions (see, for example, Feuerstein, 1985; or Haeussermann, 1958).
2. The exploration of performance capabilities in different contexts and under different circumstances and demands.
3. The examination of aptitude as a function of time on tasks appropriate to the demands of the material and skills to be learned (Carroll, 1993).

4. The iterative exposure to probation, mediation, mediated probation, and re-probation as in the dynamic assessment procedures of Feuerstein (1985), Gordon (Gordon, Bridglall, & Meroe, 2004), and Armour-Thomas (Armour-Thomas & Gopaul-McNicole, 1998).
5. Assessments embedded in teaching and learning transactions, where the assessment data are extracted from the rich relational processes of teaching and learning.
6. The analysis of the relational adjudication of competing conceptualizations and social relationships.
7. The deconstruction of the test items to reveal the learning-task demands or processual features of the required performance.
8. Relational analysis of teaching, learning, and assessment data that can inform the teaching, learning, and reassessment processes.

In this context, the central purpose of assessment will be to inform and improve teaching and learning. Prediction and selection will be downplayed, in part because the validity of the predications will be sabotaged and the reliability of the indicators may be compromised by the interventions that these data inform. Prescription, development, habilitation, exploration, mediation, and targeted remediation will be privileged.

In C. Wright Mills’ beautiful little book, *The Sociological Imagination* (1967), Mills challenges the social scientist to ask the “what if” and “why not” questions. As we contemplate the future of assessment in education in the shaping of teaching and learning, we ask: What if we viewed the assessment process as developmental, as part of the treatment? Why not use assessment as a dimension of pedagogy, to cultivate intellect rather than simply to measure it?¹

¹ This commentary is an adaptation of a chapter written by Edmund W. Gordon for Carol Dwyer’s book *The Future of Assessment* (2008).

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Abstracts from Selected Papers in Progress

What Will It Mean To Be an Educated Person in the Mid-21st Century?

**Carl Bereiter and
Marlene Scardamalia**

Introduction

For the most part, the academic competencies from the mid-20th century remain as important now as they did then and have been joined by challenging new content and capacities. The coming decades are likely to see the individual learner sharing space with the group as the unit of analysis. In many ways, learning not only takes place in groups, but is a group-level phenomena. Therefore, this paper focuses not only on the 21st-century learner, but the 21st-century society.

A Different Kind of Person?

Before we can speculate about the educated 21st-century person, we must observe what we know about 21st-century people in general. Social networks of vastly expanded circles of putative friends are supplementing networks of direct contacts. Communication in the social media sphere is person-centered rather than content- or idea-centered and frequently takes place via short-form rather than essay-style writing. Educational planners for the coming decades will need to address the question of whether to accommodate or compensate for this shift. Accommodation may increase the prevalence of collaborative learning but reduce the depth of learning. Compensatory education focused on teaching 21st-century students how to do sustained work with ideas. The authors envision a combined approach that builds knowledge in an environment that features both a person-oriented space for social interaction around ideas in addition to

an “idea level” where ideas abstracted from the social space become objects of inquiry and development.

Education’s Two Faces

Being an educated person traditionally has had dual aspects of academic achievement and personal characteristics associated with the educational process. Recent literature has tilted towards the importance of the latter, describing them as “higher-order” or “21st-century” skills. Traditional education’s track record with these skills is inconsistent.

The 21st-century person will have ready access to facts via the Internet, but the statistical and graphical representation skills that were rare in 20th-century schooling are now practically required to read even the daily news. Financial literacy in schools is traditionally focused on personal finance, while citizens are expected to have informed positions on national economic policy.

Operationalizing the teaching of depth of understanding in these diverse topics has not been an area of strength for assessment in the past. The authors advocate a focus on the common misconceptions in these fields as a way of teasing out if there are deeper ideas that underlie superficially unrelated misconceptions that can be taught specifically to develop students’ depth of understanding. The 21st-century person’s easy access to information will also facilitate the acquisition of a breadth of knowledge that supports making analogies and performing web-based research.

Education for Change?

Project-based learning is supposed to provide preparation for substantial learning later in life. However, in school the project in question is commonly “research and present a topic” while in the real world projects more commonly take the form of “examine an emergent problem and the competencies required to solve it, self-train in those competencies if necessary, and solve the problem.” Present-day schooling provides little training for identifying and acquiring necessary new competencies. Asking students to present competency-centered projects within a subject area

rather than topic-centered projects could address this disconnect.

Another concern is the ability of institutions to adapt to changing conditions. Businesses that failed to adapt are regular features of the news. Education seems unable to reform its way out of the “mile wide, inch deep” curriculum problem despite universal agreement, and the U.S. Congress labors under historical levels of dysfunction. Education plays a role in solving each of those difficulties, but only if we can determine how to balance a focus on critical thinking with one on deep content knowledge.

More than ever, being an educated person today requires navigating diverse global cultures and ideas. This cosmopolitanism goes beyond foreign language learning and multicultural education and must be developed beyond the “junior year abroad” concept. Education for a “citizen of the world” must involve critical literacy in both old and emerging forms of media and self-representation. An educated person needs to be able to take a proactive stance as an informed theory-builder rather than merely an opinionator. The complexity of the global moral questions facing us in the 21st century demands that an educated person apply a cosmopolitan, informed mindset to finding solutions.

The educated person’s rational mindset has grown more important, as modern communication gives interest groups using propaganda techniques and appeals to emotion a wider audience than ever before. New media has made quantitative information more widely available, but that information can be used to mislead people if they are not educated in how to read and analyze it. The mid-21st-century educated person needs not only to know how to read a graph in the newspaper, but also “how to think” about it.

Real 21st-century Competencies

Cultural changes already in motion reveal competencies schools are failing to address adequately:

1. Knowledge Creation: Research is widely recognized as the path to societal betterment.

Students need to be engaged in scientific thought and the role that theory plays in the advancement of knowledge.

2. Working with Abstractions: Decision making is increasingly based on interaction with computerized data across all segments of the workforce. A modern worker needs to be able to move flexibly between abstract representations and concrete reality.

3. Systems Thinking: The problems we face are growing more complex as we learn more about them and introduce new variables. An educated mid-21st-century person will need to understand and work with complicated systems.

4. Collective Cognitive Responsibility: Collective responsibility characterizes expert teams of all kinds. Collective *cognitive* responsibility refers to the collective responsibility for understanding and staying on top of what is happening. This skill is essential for design teams, research teams, etc.

Implications for Measurement Assessment

Assessing the development of these competencies must be done over a longer time frame and with regard to more global traits than is typical of assessment today. Standardized tests that do not attempt to measure critical thinking and other higher-order skills will reveal little about how meaningfully educated a person is in the 21st century. The focus of our testing regimen must shift from assessing *knowledge* to assessing *intellectual skills* like the competencies outlined above. That shift can happen only if research on testing those competencies in a valid way is incorporated into assessments, curricula, and instruction.

On Changing Paradigms and Goals for Education in the 21st Century

**Edmund W. Gordon,
John Lawrence Aber,
David C. Berliner and
E. Wyatt Gordon**

The persistent dominant role played by families in the education and socialization of children has, perhaps, contributed to the emergence of schooling relatively late in the history of education. Competition from religious institutions, print media and now digitalized electronic information transfer could displace both families and schools as the principal sources of education (experiences and materials) in the 21st century. With this new medium, teaching will become increasingly more distant. Inquiring, thinking, knowledge-producing and learning persons will gradually replace teaching persons. What and how it is studied will, more and more, come under the control of learner choice and engagement. What will be learned and how it will be learned are more difficult to predict, since the paradigms that inform education continue to change, and learner choice and engagement depend so heavily on the epistemological and political contexts that shape those education shaping paradigms.

One of the three stated missions of The Gordon Commission on the Future of Assessment is to consider our best estimates of what education will become in the 21st century and what will be required of the educational assessment enterprise by the middle of this century. In the pursuit of addressing that component of our mission, Commissioners and Consultants to the Commission are considering a variety of anticipated and emerging changes in the paradigms by which the goals and processes of education are changing. Among these paradigms are ideas such as those that follow.

A. Led by such more recent writers as William Butler Yeats, we again see a call for a shift from thinking

about education as concerned with “filling buckets to lighting fires.” Yeats was referencing a much older conception of mind as wood that needs igniting rather than a vessel that needs filling. Increasingly the goals of education in this century will reflect the growing concern with encouraging and enabling students to learn how to learn and to be encouraged and enabled to learn to continue learning; to become enquiring persons who not only use knowledge but persons who produce and interpret knowledge. The pedagogical challenge will be less concerned with imparting factual knowledge and more concerned with turning learners on to learning and the use of their mental abilities to solve ordinary and novel problems.

B. The three “Rs”, Reading, wRiting and aRithmetic, will continue to be essential skills, but thought leaders in education, Sir Kenneth Robinson among them, increasingly point to varying combinations of three Cs as essential processes in education. The C’s include Creativity, Conceptualization, Collaboration, Communication, and Computation. The Cs are replacing the Rs as the modern ends toward which education is directed. Learning how to think critically and creatively, reason logically, interpret relationally, and access and create knowledge will be more and more privileged in the 21st century. The new century places high value on communication as reading and speaking, but also as listening and collaborating, and processing information from multiple perspectives. The capacity to recognize and even create relationships between novel and disparate inputs of information will be rewarded in this new century. The illiterate members of 21st-century societies will be those who cannot navigate the world of digital technology. Computer literacy will be a requirement of economic, educational and social intercourse, but it will mean far more than the ability to do word processing, social networking and to play electronic games. Digitalization will change the demands and opportunities of modern societies even more rapidly and radically than did industrialization, and as a result, the processes of education and its assessment will change.

C. In the 18th, 19th and 20th centuries we privileged de-contextualization in the pursuit of precision in measurement and control in experimentation.

When we turned to multivariate analysis to study complex phenomena, it was with a view to the sequential teasing out of the contribution made by each of several component variables, even while we were beginning to understand the notion of dynamic and dialectical interaction. The isolation of variables or components for the purpose of study may continue while the intent of such study is to know. However, as our purpose turns to **understanding** of the phenomena of the world and the relationships between these phenomena, experimenting, observing and measuring things out of the contexts in which they have developed and function will become more and more dysfunctional. Education and its assessment will have to become capable of capturing aspects of context, perspective and the attributions which come to be assigned to these conditional phenomena. The exactness and precision that have been gained by de-contextualization in the past will be challenged by the situative and existential sensitivities required when contextualism and perspectivism are required for understanding as well as knowing.

- D. In the interest of scientific validity, traditionally we have privileged “objective” knowledge over “subjective” information. We have been taught to try to control for or contain variance that is associated with affect and social/psychological situation. We have tended to examine cognitive functions independent of their contamination or being influenced by human biases and feelings. Yet modern social and psychological sciences are pressing us to examine or assess human performance with greater respect for the influence of affective, emotional, situative and social processes. Evidence mounts in support of the fact that these processes influence the character and the quality of human performance, yet there are numerous instances of “objectively” documented human performances that are the source of the data of traditional assessments in education. However, assessment in education in the future will have to be more sensitive to subjective phenomena — i.e., to affect, attribution, existential state, emotion, identity, situation, etc. — as will also the teaching and learning transactions in which learners are engaged.
- E. Assessment of the outcomes of learning in the interest of accountability will be with us for a while, but the future is likely to bring increased concern for assessment for the purpose of informing and improving learning and the teaching processes that enable learning. Political pressure continues to support a preoccupation with the possibly inappropriate use of educational assessment data for accountability purposes, even though such practices are not supported by the empirical evidence. Some of us feel that such accountability practices are actually counterproductive for the intended purposes. Pressure mounts from the profession and the practicalities of educational praxis for better information to inform intervention prior to the search for better information by which to determine how well we are doing. We have known for more than a century that what we do in education is imprecise; that one model does not fit all; and that much of our intervention is under-analyzed trial and error. We believe that assessment in education can and should inform and improve teaching and learning processes and outcomes, without ignoring the importance of accountability. Whether the two purposes can be served concurrently and by the same assessment instruments and systems is one of the questions to be answered.
- F. Humans will very likely continue to create technologies that make their work easier, and that amplify and expand human abilities. Some of these, as with artificial intelligence, digitalization, real-time communication, simulation, and virtualization, when combined with imagination and inventiveness, could change the importance of some of the competencies for which we currently educate, such as memorization and experiential learning or, more likely, will exacerbate the need for other functions that we currently know less about enabling — i.e., agency, disposition, relational adjudication. The human ability-amplifying technologies may make some of our educational tasks easier, but they may also create monumental challenges and opportunities for the people who are responsible for assessing, teaching and learning.
- G. Just as human intellect is increasingly recognized to be a social phenomenon that is both experienced as and produced by social interaction

and consensus, so also are teaching and learning. Even the learning we do “alone” benefits from the social transactions that have preceded it. Epistemic games and distance teaching and learning are examples of teaching and learning in isolation that depend on collective actions of others. Pedagogy of the future will need to reconcile the paradox in teaching and learning (the tension between the individual and the social in these processes) and the implications of this paradox for assessment. For assessment such questions arise as:

- Contextualized, de-contextualized and collaborative performance as targets;
- Retention and recall of knowledge and skill in one’s mind and the generation and accession of knowledge and technique through social transactions;
- Disconfirmation and validation of what is real in the presence of contextualist and perspectivist realities;
- Documentation of the relational as well as the experiential and the related problems of consensus for both, when empiricism is the epistemological basis for assessment.

Pedagogically oriented assessment models integrate the digital technologies that students need to participate in a global society. This goes beyond computer-adaptive testing into the development of a dual model for both *testing* and *project components*.

Testing Activities

When students begin a Pacesetter assessment activity, they are presented with a set of multimedia resources and are then asked to respond to three tasks that focus on an important educational goal: integrating the factual, inferential, and experiential aspects of comprehension. In the *planning task*, students use digital tools to create a database of relevant material. In the *interpretation task*, students make inferences and draw connections between the resources. In the *application task*, they draw on their own experience to place the issues they have been dealing with into a broader context.

The Pacesetter model features rich multimedia resources and digital tools, similar to the modern work environment. It records not only the product of student work, but real-time records of how students interacted with the tasks, and how closely they followed recommended practices. The model is able to provide feedback not only on what was written, but how students go about their work.

Project Activities

The *Doing English Digital* model in China requires students to use the Internet to conduct research in their major field of study. In doing so students develop skills in:

- **Searching efficiently** for relevant information
- **Evaluating critically** the information they have found
- **Organizing effectively** the information they have selected
- **Communicating fluently** in oral and written presentations

At the end of the course, a rubric built around critical thinking is used to evaluate students’ oral and written presentations. The model is tied into an online

Toward Pedagogically Oriented Assessment

Clifford Hill

Introduction

The public assumes that the accountability-focused, standardized, multiple-choice assessment regimen in the United States is appropriate for selecting individuals for opportunities and certifying them as possessing certain skills. This narrow view of standardization, based on “fairness” in task selection and test context, doesn’t reflect the latest thinking in educational measurement developed around more authentic tasks. The aim of these tasks is to *evaluate* the individual learner with a view to improving instruction.

platform that can be used by university students throughout China to post their research projects, creating an online learning community. Global communication systems throughout Asia will position the *Doing English Digital* model as a transnational research platform.

Conclusion

Pedagogically oriented assessment models better serve the educational values of John Dewey — authenticity and interactivity in fostering human learning — than traditional standardized tests used to isolate individuals and force them into artificial exercises. The evaluative feedback produced by pedagogically oriented assessment models also plays into Dewey's views on the necessity of self-reflection in education. These assessment models can integrate culture and technology into education in and for an increasingly global society.

A Vision of Education for the 21st Century

Andrew Shurtleff

Introduction and Methodology

The combination of notions of fixed intelligence and the employment demands of an Industrial-era economy created a “factory model” of schooling that dominates public K–12 education to this day. Creating innovative models of learning and assessment that challenge and transcend that limited model is the challenge of the current moment. Evidence has shown that increased standardized testing based on classic and constrictive notions of intelligence both fails to fully account for the capacity of individual students, and marginalizes skills not easily covered by the tests used.

Learning takes place in a plethora of ways and environments. To educate specifically to one of those contexts is to exclude and ignore those other paths of learning. Young people need space for collaboration

and self-discovery to develop divergent thinking and empathetic awareness.

The Social Impact of New Media on Communication

A century ago, children had the opportunity to explore their surroundings in impromptu groups free of direct parental guidance, testing the boundaries of interpersonal experience and engaging in observation and reflection. These conditions were conducive to autonomous social systems based in experiential problem solving, such as understanding, following, and enforcing the rules of a kickball game. This environment fostered communication skills and an understanding of how one's actions impacted the group and vice versa.

Over the past 25 years, the Internet has quantified and reduced these interactions to purely sight- and sound-based interactions. While this has greatly increased the immediacy of communication over any distance, the disproportionate ratio of virtual connection to meaningful human relationships can create a deep sense of isolation. Social networking platforms such as Facebook® allow us to mediate social exchange through a digital collective consciousness.

Most importantly for education, the internet enables new forms of collaboration, which has always been a driver of progress. The challenge is whether digital collaboration can be used to foster the development of the communication and socialization skills that were traditionally developed via face-to-face experiences. Students must be prepared to exist within a virtual landscape that seeks to turn them into consumers of information distorted for the purposes of others. Now more than ever, students need training in deconstruction, critical analysis, and objective synthesis of information.

Decision Science: Oversaturation in the Digital Age

In order to analyze and make decisions, we compare bundles of information. One concern in the digital age

is that people are *oversaturated* with information and can become paralyzed in the face of making good decisions. People faced with a surfeit of choices are prone to inaction. We must guard against the Internet's tendency to teach that immediate decisions, based on a broad swath of information, are preferable to later decisions based a deeper understanding. The evidence from cognitive science is that some of our best decisions are made via unconscious processes, while the internet is able to distract us from engaging in those unconscious thought processes.

In order to address this challenge, students need to be provided with time and space for face-to-face social interactions both with one another and with adult mentors concerned with their well-being, not simply their academic performance. The world will continue to evolve new methods for communication and information processing that redefine human connections. Young people need to be provided with the tools and skills to grow autonomously within that environment.

Why We Educate

Education aims to impart intellectual maturity, reasoning, and judgment to students. Thus, the devaluation of the arts and civic/social thinking in schools is detrimental to the education of young people. The usurpation of education from the classroom teacher in K–12 education has been to the benefit of standardized testing and has rendered teaching mechanized and myopic. The assessment of schools — and thus the nature of the learning that goes on within them — has been manufactured, homogenized, and now encourages passive regurgitation of information.

In order to allow students to flourish as active, independent learners, we need K–12 learning environments that are adaptive, emphasize multiple intelligence, and incorporate the arts and opportunities for unstructured face-to-face social interaction. Education needs to accommodate for the phenomena of self-awareness in a digital world being based not on our feelings in response to what we consume, but on creating and sharing content in order to elicit feelings in others. This should guide how we design systems for complex, ongoing

feedback and critical assessment of students as multi-dimensional individuals.

Academic, Social, and Emotional Development

Hyper-saturating children with digital media and information is dangerous for their healthy development. Children need a solid sense of self-value derived from real-world experience in order to learn prosocial behavior and attention skills. Teenagers need experiences that require responsibility and accountability, rather than experiences mediated by technology that can be controlled and manipulated at whim. Without those experiences, they may develop deep feelings of isolation as an adult.

Meaningful real-world experience is necessary for the development of a sense of self-control without the loss of self-esteem. Absent that experience, people risk a disconnect from themselves or the world. An overreliance on digital experience carries the danger of exacerbating the already discontinuous nature of our education system. Isolated 45-minute class periods fail to acknowledge the rhythms of development, as do digital experiences shaped by synthetic realities that are not in sync with human nature.

Approaches to K–12 teaching could benefit from a more Socratic or “partnership” approach to learning that positions the teacher as a mentor or guide. Such a relationship would better develop students’ self-awareness, self-management, relationship, and autonomous decision-making skills. The partnership approach would also re-equip teachers with the space necessary to develop the non-STEM skills necessary for developing students’ understanding of the world. The curriculum used in this approach should be highly personalized and relevant and oriented towards realistic approaches to solving problems. The goal is to strengthen each student’s sense of capacity, purpose, confidence, and autonomy.

Educational Stewardship

The knowledge schools aim to impart to students needs to be embedded in the artifacts from which

it arrives, in order to grant it meaning and utility. The theories used in geometry become visible in engineering and graphic design. Exposure to applications influences student understanding. The practice of a field involves frameworks of analysis and communication that cannot be taught in a decontextualized lecture or problem set.

Mentoring and coaching has potential to better develop both students and teachers. Too much capital has been invested in keeping students indoors preparing for tests or engaged in extracurricular activities solely to build their college applications. This paper proposes that a wiser investment is in engaging students with educative real-world phenomena, an approach termed *Educational Stewardship*. Quantitative investigation is paired with qualitative experience in application-based learning. Experiential problem-solving instills creative and critical thinking skills that are applicable in any field of employment or life challenge.

This approach runs counter to much of the American education reform discourse. Data-driven, for-profit education too often undervalues art and socialization, limits opportunities to develop critical capacity, and isolates students within disciplines without an understanding of their connections to the wider world. A more helpful model of reform would embrace the fact that improving students' lives turns on improving and utilizing the capacity of parents, professionals, and students to improve those students' communities.

Concluding Remarks

Data-driven standardized education models can be compared to fast food. If we consume too much of it, we starve ourselves of the essential nutrients it takes to live. Constant information and data starves us of the ability to develop a deep understanding of our students. Focusing only on test scores suffocates a young person's ability to think critically and engage collaboratively. The human being is not a vacuum to be filled with information, and we need an educational system that treats students as critical thinkers, not obedient consumers.

Education: Constraints and Possibilities in Imagining New Ways to Assess Rights, Duties and Privileges

Hervé Varenne

Introduction – Rights, duties, privileges

The task of transforming Horace Mann's statements about the rights of every human being into the institution of the Common School involved designing and justifying numerous sub-tasks, including the taxation of some to pay for others' children. The recruitment of billions into educational institutions produced detailed, changing, and contradictory prescriptions about how to carry out the education of children. Schools in the United States grant an individual right to a state responsibility to legislate the means by which the individual will be granted the privileges of having an education.

In an ideal world, the privileges of birth would count for nothing, there would be no "achievement gap," and failure would be a reflection of individual lack of capacity. In the 21st century, we know that principle is more an idea than a reality — achievement gaps remain and birth privilege reproduces itself. The efforts of reformers may be handicapped by their reliance on schooling. It may be time to move on from the unimpeachable idea of schools as a sufficient tool, given what we've learned about human learning in the past century.

On the school's failures

In the 1970s, an argument developed. If the fundamental mission of schools was to provide access, then the American school had been a success. If the mission was to equalize opportunities, then the school had been a failure. Social science

research such as the Coleman report backed the critics: birth privilege has found ways via family resources to co-opt an institution designed to combat that privilege. Many reform efforts, such as the comprehensive education reform starting with Comer and continuing with the work of the Harlem Children's Zone, can be seen as attempt to use what we have learned to counter familial privilege. If familial privilege is able to provide experiences that make children more successful in school, then the school should endeavor to provide those opportunities for all children. However, often privileged families are the ones who take the most advantage of those programs, such as the prosperous using legal means to manipulate the laws meant to help the disabled.

On education, comprehensively

It is unlikely that formally assessing students or teachers as successes or failures will mitigate familial effects. Human beings are capable of subverting the rational approaches of policymakers who posit that given certain conditions and interventions, the range of human outcomes can be altered. People, including the unschooled, actively learn and teach about what is happening around them in everyday life. This is as true for recent immigrants and girls in Islamist schools as it is in laboratories and schools. The response to NCLB, where instruction is shaped solely to focus on test preparation, exemplifies this mindset.

The practical consequence of this is that the world cannot be divided between the educated and uneducated — education is a universal aspect of the human condition. It cannot be controlled because any attempt to control it leads to education about the attempt to control that will co-opt the control attempt. However, acknowledging the ubiquity of education doesn't mean the state shouldn't be involved in creating the conditions and settings for education.

Ongoing assessment and its implications

Ongoing assessment involves considering “ethno-education” of the people by the people — the ethno-curriculum, ethno-pedagogy, ethno-assessment

that goes on in a child's home environment. Understanding how they operate can help us imagine routes for education that don't pass through the co-opted institution of schooling. The deficit model of the unschooled as ignorant and passive is pervasive and incorrect. The long-ago-schooled, parents and politicians, have profound impacts on the functioning and regulation of schools. Teachers, scholars, and policymakers must move beyond complaint to understand the impact of the unschooled.

Ongoing assessments provide information about interactions and how they might need to be corrected to proceed. These assessments focus on the performance of a task rather than the abstract “aptitude” required. That performance has an impact on its participants and observers. People learn from the experience and become known as having learned. Over time, that learning is challenged and defended more frequently as the nature of what is worth knowing changes.

Conclusion – Rights, duties, privileges revisited

The state is left with the responsibility of reorganizing school-based assessments leveraging what we know about ongoing assessment. The need for a re-imagining of assessment for career and citizenship purposes is more pressing now that the school is losing much of its educational function. The shift to a culture of schools focused on certification in industry skills means that instruction in and assessment of the political or musical skills formerly emphasized in schools needs to take place in non-school “commons” contexts.

This essay makes the argument that the state's duty to assess performance to distribute privilege need not involve multiple-choice tests, value-added models, or to even proceed through the institution of the school. For example, the media plays an important roll in informing citizens about health concerns or global warming. Parents don't attend formal “baby training” classes. There is a need to distinguish the various functions that schools have accreted and determine to what extent they remain the best institution to grant career and other privileges.



The Gordon Commission
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