OVERVIEW

Over 350 individuals from institutions in the WASC region participated in the inaugural WASC Resource Fairs to explore some of the resources and approaches that can be used to assess graduation proficiency in five core competencies: written and oral communication, quantitative skills, critical thinking, and information literacy. The one-day event was a great opportunity to network with peers in the region, gather information, learn more about key elements of the WASC redesign, and provide feedback to WASC on appropriate parameters for documenting graduation proficiencies.

When and Where:

Northern California Resource Fair
January 19, 2012 from 10 am – 4 pm
CSU East Bay, Hayward, CA

Southern California Resource Fair
January 20, 2012 from 10 am – 4 pm
Woodbury University, Burbank, CA

What:

The WASC Commission has approved the first stage of the accreditation redesign process. A major component of the redesign is that institutions will be expected to demonstrate that their graduates have achieved the institution’s stated level of proficiency at least in the following five areas stated in CFR 2.2a: written and oral communication, quantitative skills, critical thinking and information literacy. The Commission views this new element of the institutional review process as an essential step forward but also recognizes that it poses a challenge. Thus, WASC seeks to work with our member institutions, learn from them, and become a resource to support the region’s higher education community as we all respond to rising public and federal expectations for accountability and student achievement.

Overview of the Resource Fair:

Over the past 30 years, assessment approaches have evolved, tools have been developed, and a degree of consensus regarding good assessment practice has emerged. We understand that member institutions, their departments and programs may be at varying stages of implementation. We believe, however, that no institution is starting from zero, that all institutions can benefit from a wide-ranging conversation about how to approach graduation proficiencies, and that we can do so most productively in an atmosphere of collegiality and mutual support.

At the Resource Fairs on January 19th and 20th, WASC brought together institutional representatives, experts in the field, test publishers, and producers of software to: 1) discuss promising practices and challenges in documenting graduation proficiencies; 2) identify tools for assessing and reporting graduation proficiencies at undergraduate and graduate levels; 3) share ideas with one another; and 4) provide feedback to WASC on appropriate frameworks for documenting and improving graduation proficiencies.
# Agenda

## 10:00 - 10:20: Introduction and Welcome

## 10:20 - 4: Vendor Exhibition

<table>
<thead>
<tr>
<th>Session 1</th>
<th>10:30 - 11:00</th>
<th>Colleague Learning Assessment (CLA) Chris Jackson</th>
<th>LiveText Katherine Kalmus</th>
<th>VALUE Rubrics Terry Rhodes</th>
<th>Signature Assessments Amy Driscoll</th>
<th>Insight Assessment Critical Thinking Tests Noreen Facione</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 2</td>
<td>11:15 - 11:45</td>
<td>ETS: Proficiency Profile Bill Wynne</td>
<td>Colleague Assessment of Academic Proficiency (CAAP) Sandra Stewart</td>
<td>Capstones Jennifer Lindholm</td>
<td>Using the Critical Thinking Assessment Test (CAT) Susan Hippensteele</td>
<td>Collaborative Work Sessions</td>
</tr>
</tbody>
</table>

## 11:50 - 12:50: Lunch

## 1 - 1:30: Cohort Breakouts

<table>
<thead>
<tr>
<th>Session 3</th>
<th>1:45 - 2:15</th>
<th>ETS: iSkills Assessment Bill Wynne</th>
<th>Assessment Management with TaskStream Katelin Trowbridge</th>
<th>General Assessment and Critical Thinking Peter Facione</th>
<th>ePortfolios Helen Chen</th>
<th>Collaborative Work Sessions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Session 4</td>
<td>2:30 - 3</td>
<td>Nuventive Scott Johnson</td>
<td>Insight Assessment Critical Thinking Tests Noreen Facione</td>
<td>Signature Assessments Amy Driscoll</td>
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<tr>
<td>Session 5</td>
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<td>ePortfolios Helen Chen</td>
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</tbody>
</table>
Dear Participant:

We welcome your participation in today’s Resource Fair. We hope that it will provide useful information to support your efforts to assess and improve student learning within your institution. By bringing together institutional representatives, experts in the field, test publishers, and producers of software our goals are to: 1) discuss promising practices and challenges in documenting graduation proficiencies; 2) identify tools for assessing and reporting graduation proficiencies at undergraduate and graduate levels; 3) share ideas with one another; and 4) provide feedback to WASC on appropriate frameworks for documenting and improving graduation proficiencies.

We hope you find today’s Resource Fair productive and that you leave with new ideas for your institution that go beyond “compliance with WASC” toward effective engagement at your home institution about what is good learning for your students in the 21st century.

Background:

Institutions of higher education – along with accrediting agencies – are under increasing pressure to demonstrate that students are receiving a high-quality education for the 21st century. The increasing diversity of students in terms of backgrounds, levels of preparation, and multiple institutional attendance makes the definition and achievement of clearly stated outcomes all the more important. The 2001/2008 Standards of Accreditation called for all institutions to articulate and align learning outcomes at the institutional, program, and course levels, and to demonstrate that graduates were consistently achieving these outcomes. The Commission has been pleased with the significant progress all institutions have made in response to these Standards, and the next iteration of the WASC process is fully intended to build upon this work.

In November 2011, after more than a year of engagement, the Commission approved the first stage of its accreditation redesign process. A core value underlying the Commission action is the increased focus on student success and student learning as the center of the accrediting process. Institutions are expected to be able to more clearly articulate the meaning and rigor of all degrees offered and to assure that all undergraduate degrees provide, among other things, demonstration of proficiencies in at least five areas commonly expected of all baccalaureate graduates. These proficiencies have long been a part of accreditation standards, and the Commission is building on CFR 2.2a by calling for these proficiencies to be demonstrated in the capacities of the institution’s graduates. The following five proficiencies were drawn from the larger list of expectations sited in 2.2a: written communication, oral communication, quantitative skills, critical thinking, and information literacy.

Some key principles will be applied by the Commission in the implementation of these new expectations:

- It will be the responsibility of the institution, not the Commission, to define these proficiencies, levels of expectations appropriate for its graduates, and methods of assessment for assuring their achievement.
- The Commission supports multiple approaches to addressing these proficiencies and understands that there may be variations within institutions as well.
- These proficiencies are to be seen as part of the larger expectation of assuring the achievement of program and institutional goals and may be demonstrated through
any variety of ways.

- In developing the expectation that these proficiencies be demonstrated at the graduation level, the Commission has intended to move beyond minimum standards, but to have them incorporated as part of rigorous courses of study whether part of general education or program outcomes.

- The Commission supports innovative approaches to addressing these and other commission initiatives respecting the diversity of institutional types and missions reflected in the WASC region.

Through activities such as these Resource Fairs, the Commission is providing support for institutions and is facilitating a dialogue about how institutions are defining and assessing learning outcomes, especially in the five areas identified in CFR 2.2.

Thank you for your participation,

Ralph A. Wolff
President

Hi.

Welcome to WASC’s first Resource Fair. We are glad you could join us to explore ways to assess the five graduation proficiencies—written communication, oral communication, critical thinking, quantitative skills, and information literacy—found in CFR 2.2(a). Our day is divided into sessions with three different types of speakers: those who are institutional or organizational representatives who are discussing what they have used on campuses; those who represent specific tests and tools to measure specific competencies; and those who represent products for collecting, aggregating, and analyzing data provided by local methods of assessment or tests. In addition, built into the schedule is time and space devoted to collaborative work, where you can meet with your peers and discuss how the five graduation proficiencies are being assessed on your campuses.

Our goals for the Fair are to provide a great opportunity to network with peers in the region, gather information, learn more about key elements of the WASC redesign, and provide feedback to WASC on appropriate parameters for documenting graduation proficiencies. We look forward to rich discussions and to learning together.

Sincerely,

Jill L. Ferguson
Director of Organizational Change
HELEN CHEN: ELECTRONIC PORTFOLIOS AND STUDENT SUCCESS: A FRAMEWORK FOR EFFECTIVE IMPLEMENTATION

**Presentation Description:** Electronic portfolios (ePortfolios) have become a popular and powerful way to document, demonstrate, and reflect upon what students know and can do. But how can they be implemented effectively to promote and assess student success? This interactive session oriented towards practitioners will highlight key issues to consider when designing an ePortfolio initiative to address the pedagogical, technological and strategic needs of campus stakeholders.

**Helen L. Chen** is a Research Scientist in the School of Engineering and Project Director for ePortfolio Initiatives in the Office of the Registrar at Stanford University. She is a founding member and co-facilitator of EPAC, a community of practice focusing on pedagogical and technological issues related to ePortfolios. Helen is also the Director of Research for the Association for Authentic, Experiential and Evidence-Based Learning and works closely with the Association of American Colleges and Universities where she is currently a member of the Assessment Advisory Group for the Quality Collaboratives project and a faculty member for the Institute on General Education and Assessment. Helen and her colleagues, Tracy Penny-Light and John Ittelson, are the authors of the forthcoming book, *Documenting Learning with ePortfolios: A Guide for College Instructors*.

AMY DRISCOLL: SIGNATURE ASSESSMENTS: POSSIBILITIES FOR COMMON DATA SET TRENDS AND TAILORED ASSIGNMENTS

**Presentation Description:** This session will introduce “Signature Assessments” as an alternative to standardized or other forms of tests for assessing student learning across multiple courses, programs, and disciplines. The use of “signature assessments” is especially relevant for use in general education programs, for determining achievement of institutional learning outcomes (ILO’s), and for programs in which students have choices of multiple courses in which to achieve program learning outcomes (PLO’s). Examples of “signature assessments” will be presented to illustrate their development processes and how they can be tailored to reflect the institution or program mission.

**Amy Driscoll** retired as Director of Teaching, Learning, and Assessment at California State University, Monterey Bay, and was most recently a Consulting Scholar with the Carnegie Foundation for the Advancement of Teaching. Previously, Amy was the Director of Community/University Partnerships at Portland State University, where she initiated the community-based learning and capstone aspects of the university’s innovative curriculum. Dr. Driscoll has presented at AAHE, AAC&U, WASC, and National Assessment Institute conferences. She has also mentored more than 60 institutions in their development and implementation of institutional assessment and/or community engagement. Her most recent book is *Developing Outcomes-based Assessment for Learner-centered Education, A Faculty Introduction* co-authored with Swarup Wood, a chemistry professor, and published by Stylus (2007).
**Presentation Description:** Applying critical thinking to the issue of critical thinking assessment, Dr. Facione provides a systematic overview of issues that need to be addressed when evaluating alternative critical thinking assessment solutions. Informed by good questions, faculty committees and academic leaders are better prepared to evaluate the relative strengths, benefits, risks, and weaknesses of alternative modalities of critical thinking assessment. For what purposes, for example, might rubrics be the best option, and for what purposes are objective tests indicated? What are the relative merits of measures which conflate closely related constructs as compared to measures which parse them apart? What differentiates commercial instruments that measure critical thinking from a typical final exam in a college course? How do alternative assessment solutions address the many complex educational, theoretical, practical, political, and economic pushes and pulls on an academic institution’s assessment program: Validity, reliability, cost, use of faculty time, selection of students to be tested, quality of student effort, relevancy of norms, credibility of the results, objectivity of scoring, utility of the results for curriculum development and other academic purposes, etc.

**Dr. Peter (Pete) Facione** is the founder of Measured Reasons, a research and consulting firm, and a Managing Partner of the Insight Assessment. As a speaker he is listed with Leading Authorities, Washington DC. Earlier he was strategic consultant with the Stratus Division of Heery International. In academia Dr. Facione served as Provost, Loyola University Chicago; Dean of College Arts and Sciences, Santa Clara University; and Dean Human Development and Community Service at CSU Fullerton. As a dean he was a member of the ACE Task Force on Teacher Education; and national chairperson of the American Conference of Academic Deans. His books include: *THINK Critically, 2011; Critical Thinking and Clinical Reasoning in the Health Sciences, 2008,* and *Thinking and Reasoning in Human Decision Making, 2007.* He authored the California Critical Thinking Skills Test and other internationally used measures of reasoning and decision making.

**NEW Educational Programming—Coming Fall 2012**

**WASC Workshops on the Five Graduation Proficiencies**

1) Written and Oral Communication
2) Information Literacy and Critical Thinking
3) Quantitative Skills and the Major
**Presentation Description:** This project examines the impact of a unique freshman general education course emphasizing critical thinking and science literacy on student learning outcomes and progress toward degree. Our hypothesis is that freshman who gain applied scientific reasoning skills will be better prepared to succeed in college. An important feature of the course is that teaching team members emphasize the acquisition of critical thinking and scientific reasoning skills transferable across different disciplines. The course is evaluated using the Critical Thinking Assessment Test (CAT), a nationally recognized assessment instrument that facilitates faculty development and iterative teaching. We also intend to develop a data-tracking model that will enable us to identify the impact of successful completion of this course on student progress to degree. Our data-tracking model will serve as a pilot that, once tested and refined, can be adopted to assess the impact of a variety of courses relevant to institutional learning goals.

**Susan K. Hippensteele, Ph.D., J.D.,** is a faculty member at the University of Hawaii at Manoa (UHM). She served as Special Assistant for Accreditation in the Office of the Vice Chancellor for Academic Affairs at UHM during the campus’ last accreditation cycle that resulted in a 10 year accreditation award. Dr. Hippensteele has served as chair of the faculty senate at her campus, led the most recent strategic planning process, and is currently coordinating implementation of the 2011-2015 UHM strategic plan. Her current research involves teaching and assessing critical thinking and science literacy within general education.

**Jennifer Lindholm: Capstones and Core Competencies: Emerging Pathways for Assessing Student Learning**

**Presentation Description:** This session highlights UCLA’s efforts to engage undergraduates in capstone experiences and related efforts to incorporate new approaches to assessing student learning and evaluating proficiency in core competencies. Efforts to foster a student-focused, outcomes-based, and process-oriented climate for learning and teaching will be highlighted, and potential applications for other institutions will be addressed.

**Jennifer Lindholm** currently serves as Special Assistant to the Vice Provost for Undergraduate Education & WASC Coordinator at UCLA. In July 2012, she will transition to directing the Learning Assessment and Special Projects Unit within UCLA’s newly established Center for Educational Assessment. Previously, Jennifer was Visiting Assistant Professor of Education at UCLA and Associate Director of the Cooperative Institutional Research Program at the Higher Education Research Institute (HERI). While at HERI, she also directed the Institute’s Triennial National Faculty Survey. Jennifer’s research focuses on the structural and cultural dimensions of academic work; the career development, work experiences, and professional behavior of college faculty; undergraduate students’ academic, personal, and spiritual development; college teaching and learning; and institutional transformation.
Presentation Description: Participants will engage in a brief overview of the development of the VALUE rubrics as an alternative to the standardized, snap shot tests for measuring student learning. The VALUE rubrics address core competencies sought through accreditation, by employers, and taught by faculty. In this session we will examine how specific colleges and universities are using the rubrics to assess and improve student learning, the data on learning they are generating, and how consortia of campuses are collaborating through use of the rubrics to explore learning across very different campuses and student bodies around the same learning outcomes.

Terrel Rhodes is currently Vice President for the Office of Quality, Curriculum and Assessment at the Association of American Colleges and Universities (AAC&U) where he focuses on the quality of undergraduate education, access, general education, and assessment of student learning. He is also director of AAC&U’s General Education Institute and Integrative Learning and the Departments Institute. Rhodes received his B.A. from Indiana University at Bloomington and his M.A. and Ph.D. in Political Science from the University of North Carolina at Chapel Hill. Before moving into national higher education work, he was a faculty member for over twenty-five years.
PRODUCT: Business Critical Thinking Skills Test (BCTST)

COMPANY: Insight Assessment

DESCRIPTION OF PRODUCT:
The Business Critical Thinking Skills Test (BCTST) is designed to evaluate the critical thinking skills of MBA students, undergraduate Business students and working professionals. One of the profession-specific versions of the CCTST, the BCTST was developed and field tested in consultation with senior business leaders to create a business-relevant instrument that tests the critical thinking skills needed for success in the business profession. In academia, the BCTST is used by schools of business for professional accreditation, admissions, and program evaluation; in the private sector it has become a preferred measure in corporate hiring. Customers typically use individual cut scores to shape their admissions cohort or to select new hires with strong thinking skills, and use group scores to evaluate curricula and employee training programs.

GRADUATION PROFICIENCIES ASSESSED:

<table>
<thead>
<tr>
<th>Written Communication</th>
<th>Oral Communication</th>
<th>Critical Thinking</th>
<th>Quantitative Skills</th>
<th>Information Literacy</th>
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FORMAT OF PRODUCT:

<table>
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<tr>
<th>Multiple Choice</th>
<th>True/False</th>
<th>Short Answer</th>
<th>Essay</th>
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<tr>
<th>Problem Sets</th>
<th>Oral</th>
<th>Performance</th>
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HOW ARE SCORES REPORTED?

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<th>Norm/Group Referenced</th>
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<tr>
<td>Criterion/Standards Referenced</td>
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<tr>
<td>Other: Workplace Standards</td>
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DESCRIBE HOW THE NORMS ARE SET:
Representative national sample of each specific published norm group. Choice of norm comparison at test adoption includes: two-year college business students, four-year college business students, graduate students, top tier business schools, graduate professionals, others upon request.

WHAT LEVEL/S DOES THE ASSESSMENT TOOL TARGET:
Undergraduate and Graduate

WHAT IS THE COST PER STUDENT INCLUDING ANCILLARY COSTS?
Use of the BCTST for outcomes assessment, educational research, and program evaluation is discounted. Most non-profit institutions currently test for less than $10 per test administration. Full quotes for test adoption are available upon request.
**PRODUCT:** Business Critical Thinking Skills Test (BCTST)  
**COMPANY:** Insight Assessment

**Describe How the Tool Provides Feedback:**

Feedback to instructors: Test scores for each individual test taker are provided in spreadsheet format for easy distribution to instructors or integration into your campus database. Scores include: BCTST Total Score, national percentile ranking, and scale scores for selected skill areas (Analysis, Interpretation, Inference, Evaluation, Explanation, Inductive Reasoning, Deductive Reasoning). Group statistics with appropriate graphics are also provided.

Student Feedback: A printable results report is provided to each test taker upon completion of the test, at the discretion of the test administrator (online testing only). Paper and pencil testing results must be distributed by the test administrator.

**Other Pertinent Information about the Assessment Tool:**

Insight Assessment provides staff consultation to each customer to optimize your selection of testing options, testing design, and results delivery.

**What Research Studies that have been conducted to validate the Assessment Tool?**

The CCTST family of instruments, which includes the many versions of the CCTST, as well as the BCTST, HSRT, MDCTI, LSRP and the TER, have repeatedly demonstrated their content, concurrent, predictive, and criterion validity, the strongest form of validity. Evidence for the validity and reliability of these instruments is provided by peer-reviewed research reports and posted educational reports numbering into the thousands. A partial list of research documenting use of the CCTST to capture gains in learning outcomes, predicting success in workplace transition, performance on professional licensure examinations, and evaluating the effectiveness of teaching and learning techniques is included in each test manual and is posted on our website. Further information about item development, the structure of the instrument, and related validation studies is proprietary.

**Insight Assessment has a Wide Variety of Assessment Tools that Include:**

- California Critical Thinking Skills Test  
- Business Critical Thinking Skills Test  
- California Critical Thinking Disposition Inventory  
- Professional Judgment Rating Form  
- Test of Everyday Reason  
- Health Science Reasoning Test  
- Legal Studies Reasoning Profile  
- Quant Q

For more information, contact Insight Assessment directly. Use the handy “Contact us” option on the website www.insightassessment.com or telephone an agent for assistance: 1-650-697-5628
PRODUCT: California Critical Thinking Disposition Inventory (CCTDI)

COMPANY: Insight Assessment

DESCRIPTION OF PRODUCT:
The California Critical Thinking Disposition Inventory (CCTDI) was a groundbreaking measure and remains today the premier tool for surveying the dispositional aspects of critical thinking. The CCTDI measures the “willing” dimension in the expression “willing and able” to think critically. The CCTDI returns qualitative and quantitative scores on seven aspects of the disposition toward critical thinking: truth-seeking, open-mindedness, analyticity, systematicity, confidence in reasoning, inquisitiveness, and maturity of judgment. Higher scores on the CCTDI indicate a strong likelihood that the test taker will consistently apply critical thinking skills in decision making and problem solving contexts.

GRADUATION PROFICIENCIES ASSESSED:

Written Communication
☐

Oral Communication
☐

Critical Thinking
☑

Quantitative Skills
☐

Information Literacy
☐

FORMAT OF PRODUCT:

Multiple Choice
☐

True/False
☐

Short Answer
☐

Essay
☐

Problem Sets
☐

Oral
☐

Performance
☐

Matching
☐

Other: Likert Style Items
☐

HOW ARE SCORES REPORTED?

Norm/Group Referenced
☐

Criterion/Standards Referenced
☑

DESCRIBE HOW THE NORMS ARE SET:

N/A. Success in building desired attributes or habits of mind is not assessed in relation to a national norm. Scores document the degree to which the desired attribute is present.

WHAT LEVEL/S DOES THE ASSESSMENT TOOL TARGET:

Undergraduate and Graduate

WHAT IS THE COST PER STUDENT INCLUDING ANCILLARY COSTS?

Use of the CCTDI for outcomes assessment, educational research, and program evaluation is discounted. Most non-profit institutions currently test for less than $10 per test administration. Full quotes for test adoption are available upon request.
PRODUCT: California Critical Thinking Disposition Inventory (CCTDI)
COMPANY: Insight Assessment

Describe how the tool provides feedback:
Feedback to instructors: Test scores for each individual test taker are provided in spreadsheet format for easy distribution to instructors or integration into your campus database. Individual student profile scores are interpretable categorically as well as numerically. Group statistics with appropriate graphics are also provided.

Student Feedback: A printable results report is provided to each test taker upon completion of the test, at the discretion of the test administrator (online testing only). Paper testing results must be distributed by the test administrator.

Other pertinent information about the assessment tool:
Insight Assessment provides staff consultation to each customer to optimize your selection of testing options, testing design, and results delivery.

What research studies that have been conducted to validate the assessment tool?
The world’s leading measure of critical thinking habits of mind, the CCTDI has demonstrated its concurrent, predictive, and criterion validity, the strongest form of validity. Evidence for the validity and reliability of the CCTDI has been published by independent researchers around the world who have used the CCTDI for their own funded peer-reviewed research. The peer-reviewed research literature about the CCTDI is extensive, too vast to list in the space available here, but a partial list of research documenting use of the CCTDI is included in the instrument’s user manual and is posted on our website. Researchers have correlated CCTDI scores with stage of cognitive development, leadership potential, ego resilience, and with the capacity to benefit from educational training and psychological counseling. Further information about item development, the structure of the instrument, and related validation studies is proprietary.

Insight Assessment has a wide variety of assessment tools that include:
- California Critical Thinking Skills Test
- Business Critical Thinking Skills Test
- California Critical Thinking Disposition Inventory
- Professional Judgment Rating Form
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For more information, contact Insight Assessment directly. Use the handy “Contact us” option on the website www.insightassessment.com or telephone an agent for assistance: 1-650-697-5628
PRODUCT: California Critical Thinking Skills Test (CCTST)

COMPANY: Insight Assessment

DESCRIPTION OF PRODUCT:
The California Critical Thinking Skills Test (CCTST) is the premier critical thinking skills test in the world today. Based on the independently replicated, multi-disciplinary Delphi Expert Consensus Definition of Critical Thinking, the CCTST is used by institutions of higher education throughout the United States for outcomes assessment, accreditation, admissions and program evaluation purposes. Administered online or paper-and-pencil, this instrument has been used in NSF and NIH funded studies, international educational projects, business and government employee development, NGO and community agency evaluations, and as the measurement tool of choice in more than 250 doctoral dissertation studies. The CCTST item pool, the result of more than 30 years of educational and measurement research, supports a family of profession-specific critical thinking skills measures (BCTST, HSRT, TER, LSRP, MDCTI) designed for every educational level, as well as the international CCTST, which today serves more than 15 language populations.

GRADUATION PROFICIENCIES ASSESSED:

- Written Communication
- Oral Communication
- Critical Thinking
- Quantitative Skills
- Information Literacy

FORMAT OF PRODUCT:

- Multiple Choice
- True/False
- Short Answer
- Essay
- Problem Sets
- Oral
- Performance
- Matching

HOW ARE SCORES REPORTED?

Norm/Group Referenced  ✓  Criterion/Standards Referenced  ✓
Other: Workplace Standards

DESCRIBE HOW THE NORMS ARE SET:
Representative national sample of each specific published norm group. Choice of norm comparison at test adoption includes: two-year college business students, four-year college business students, graduate students, top tier business schools, graduate professionals, others upon request.

WHAT LEVEL/S DOES THE ASSESSMENT TOOL TARGET:
Undergraduate and Graduate

WHAT IS THE COST PER STUDENT INCLUDING ANCILLARY COSTS?
Use of the CCTST for outcomes assessment, educational research, and program evaluation is discounted. Most non-profit institutions currently test for less than $10 per test administration. Full quotes for test adoption are available upon request.
PRODUCT:  California Critical Thinking Skills Test (CCTST)
COMPANY:  Insight Assessment

**Describe how the tool provides feedback:**
Feedback to instructors: Test scores for each individual test taker are provided in spreadsheet format for easy distribution to instructors or integration into your campus database. Scores include: CCTST Total Score, national percentile ranking, and scale scores for selected skill areas (Analysis, Interpretation, Inference, Evaluation, Explanation, Inductive Reasoning, Deductive Reasoning). Group statistics with appropriate graphics are also provided.

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**What research studies that have been conducted to validate the assessment tool?**
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**Insight Assessment has a wide variety of assessment tools that include:**
- California Critical Thinking Skills Test
- Business Critical Thinking Skills Test
- California Critical Thinking Disposition Inventory
- Professional Judgment Rating Form
- Test of Everyday Reason
- Health Science Reasoning Test
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- Quant Q

For more information, contact Insight Assessment directly. Use the handy “Contact us” option on the website www.insightassessment.com or telephone an agent for assistance: 1-650-697-5628
**PRODUCT:**
Collegiate Assessment of Academic Proficiency (CAAP)

**COMPANY:**
ACT, Inc.

**DESCRIPTION OF PRODUCT:**
CAAP is a standardized, nationally normed assessment program from ACT that enables postsecondary institutions to assess, evaluate, and enhance student learning outcomes and general education program outcomes. CAAP is a curriculum-based assessment, with six modules that include 5 objective tests - Writing Skills, Critical Thinking, Mathematics, Science, and Reading - and a Writing Essay. Four modules align with The ACT® Test (Writing, Reading, Math, and Science). Each CAAP module is tested during 40-minute timed administration (proctored) and can be easily embedded in a class or capstone course.

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Other: Reading Comprehension and Science Reasoning

**FORMAT OF PRODUCT:**

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**HOW ARE SCORES REPORTED?**

Norm/Group Referenced ✓ Criterion/Standards Referenced □

Reports at institution and student level

**DESCRIBE HOW THE NORMS ARE SET:**
Rolling three year norms (from previous three years of test data), provided in norms tables by classification, ownership (public/private), and by grade level. Custom normative groups are also available. Norm tables are available at www.act.org/caap/norms

**WHAT LEVEL/S DOES THE ASSESSMENT TOOL TARGET:** Undergraduate

**WHAT IS THE COST PER STUDENT INCLUDING ANCILLARY COSTS?**
The cost of the objective test modules are based on the number of tests completed per answer sheet. A single objective test is $14; 2-5 objective tests on a single answer document is priced at $21. The Writing Essay is a separate $14. These costs include the Standard Reporting Package. There is no up front cost - the invoice is generated based on number of tests/answer documents scored. Additional research reports (optional) are the Linkage Report at $412 and the Content Analysis Report at $82.50. The institution also pays shipping for return of all test materials after completion of the testing administration. Order information, including an order form and pricing, can be accessed at http://www.act.org/caap/order/
PRODUCT: Collegiate Assessment of Academic Proficiency (CAAP)
COMPANY: ACT, Inc.

DESERIBE HOW THE TOOL PROVIDES FEEDBACK:

The CAAP Standard Reporting Package includes an Institutional Summary Report, two Student Score Reports, a Student Roster, and a Certificate of Achievement for each student who scores at/above the national mean. A sample of the report is available at http://www.act.org/caap/report/standard.html. A total score is provided, as well as sub scores on the Math, Writing Skills, and Reading modules. CAAP can help:

• Satisfy accreditation and accountability reporting requirements
• Measure students’ achievement levels on a group and individual basis
• Compare students’ achievement levels with national user norms
• Evaluate the strengths and weaknesses of general education programs
• Document the performance gain of students’ achievement levels over time with an ACT/CAAP or COMPASS/CAAP Linkage Report
• Analyze what interventions may be necessary to enhance results, using feedback from the CAAP Content Analysis Report
• Determine student eligibility for upper-division studies
• Measure student learning outcomes for Voluntary System of Accountability (Critical Thinking & Writing Essay)

OTHER PERTINENT INFORMATION ABOUT THE ASSESSMENT TOOL:

CAAP can be administered at any time, and multiple times during one’s academic years. There is a two-week test window for the tests to be administered. Supplemental reports are available for purchase to aggregate data into a combined report per year. Sample test booklets are available at www.act.org/caap/sampletest. A student web site provides students an overview of the assessment, in addition to a PDF of the CAAP Student User Guide - http://www.act.org/caap/about/students.html. More information and additional resources can be found at the CAAP web site - www.act.org/caap

WHAT RESEARCH STUDIES THAT HAVE BEEN CONDUCTED TO VALIDATE THE ASSESSMENT TOOL?

The CAAP Technical Handbook provides reliability and validation information and is available on-line at www.act.org/caap/techhandbook

CAAP was also among the instruments in the FIPSE VSA Test Validity Study. Results are available at http://www.voluntarysystem.org/index.cfm?page=research

REPRESENTATIVE: Sandra Stewart, Senior Consultant Client Outreach, Postsecondary
PHONE: 319-337-1051
EMAIL: sandra.stewart@act.org
WEBSITE: www.act.org/caap
PRODUCT: Collegiate Learning Assessment (CLA)
COMPANY: Council for Aid to Education

**Description of Product:**
The CLA equips institutions to improve higher-order skills through the connection of teaching, learning, and assessment through authentic performance-based practices.

**Graduation Proficiencies Assessed:**
- Written Communication [✓]
- Oral Communication [☐]
- Critical Thinking [✓]
- Quantitative Skills [☐]
- Information Literacy [☐]
- Other: Problem Solving and Analytic Reasoning [☐]

**Format of Product:**
- Multiple Choice [☐]
- True/False [☐]
- Short Answer [☐]
- Essay [✓]
- Problem Sets [☐]
- Oral [☐]
- Performance [✓]
- Matching [☐]

**How are scores reported?**
- Norm/Group Referenced [✓]
- Criterion/Standards Referenced [✓]

**Describe how the norms are set:**
Norms are established by the performance of the institutions that are participating in the CLA in any given academic year (though norming equations remain stable from year to year). For more information, please see the CLA Technical FAQs: [http://bit.ly/qabNUS](http://bit.ly/qabNUS)

**What level/s does the assessment tool target:**
Undergraduate

**What is the cost per student including ancillary costs?**
$33 per student for the first 200 students assessed (100 freshmen and 100 seniors).
$25 per student thereafter.
Describe how the tool provides feedback:

In addition to holistic information about the learning gains an institution is contributing to its students’ growth, the CLA also provides formative subscores in the areas of analytic reasoning, problem solving, writing mechanics and writing effectiveness. The provision of these subscores is designed to provide faculty with information that will allow them to target specific areas for improvement. Scores are also provided in the form of a comprehensive data file, also designed to allow for the analysis of performance by subgroup or to allow for the cross-comparison with additional variables collected locally.

Other pertinent information about the assessment tool:

The CLA emphasizes the importance of effective and authentic alignment of teaching, learning, and assessment. To that end—and by the request of faculty at colleges and universities across the country—we have developed a workshop (the Performance Task Academy) to teach faculty how to create their own CLA-like Performance Tasks for use in the classroom. More information is available at claintheclassroom.org.

What research studies that have been conducted to validate the assessment tool?

- The CLA: Setting Standards for Performance at a College or University (Hardison, Vilamovska): http://bit.ly/s7UKDT

Representative: Chris Jackson, Director of Business Development
Email: c.jackson@cae.org
Phone: 212-217-0845
Website: www.collegiatelearningassessment.org
PRODUCT: Health Science Reasoning Test (HSRT)  
COMPANY: Insight Assessment

**DESCRIPTION OF PRODUCT:**

The Health Science Reasoning Test (HSRT) is the leading measure of critical thinking skills within the context of clinical reasoning and health sciences decision making. Critical thinking is at the very heart of diagnostic reasoning and poor critical thinking can have grave consequences for the lives and welfare of patients. The HSRT is used worldwide in high ranking health science education programs, at top rated medical centers, and branches of the US military to measure critical thinking skills of undergraduate students, graduate students, trainees, and practicing professionals. More than 100 Independent research with the HSRT document effectiveness of training programs to improve clinical decision making and demonstrate that HSRT scores are predictive of preceptor ratings, licensure pass rates and the successful transition to the clinical workplace.

**GRADUATION PROFICIENCIES ASSESSED:**

- Written Communication
- Oral Communication
- Critical Thinking
- Quantitative Skills
- Information Literacy

**FORMAT OF PRODUCT:**

- Multiple Choice
- True/False
- Short Answer
- Essay
- Problem Sets
- Oral
- Performance
- Matching

**HOW ARE SCORES REPORTED?**

- Norm/Group Referenced
- Criterion/Standards Referenced
- Other: Workplace Standards

**DESCRIBE HOW THE NORMS ARE SET:**

Representative national sample of each specific published norm group. Choice of norm comparison at test adoption includes: undergraduate health science students, graduate health science students, two-year college health science students, Pharmacy graduate and undergraduate, Nursing graduate and undergraduate, Dentistry graduate, Medicine graduate, Physical Therapy graduate and undergraduate, Dental Hygiene two-year college, undergraduate and graduate.

**WHAT LEVEL/S DOES THE ASSESSMENT TOOL TARGET:**

Undergraduate and Graduate

**WHAT IS THE COST PER STUDENT INCLUDING ANCILLARY COSTS?**

Use of the HSRT for outcomes assessment, educational research, and program evaluation is discounted. Most non-profit institutions currently test for less than $10 per test administration. Testing of students being educated in for-profit hospital settings is also partially discounted. Full quotes for test adoption are available upon request.
Describe how the tool provides feedback:

Feedback to instructors: Test scores for each individual test taker are provided in spreadsheet format for easy distribution to instructors or integration into your campus database. Scores include: HSRT Total Score, national percentile ranking, and scale scores for selected skill areas (Analysis, Interpretation, Inference, Evaluation, Explanation, Inductive Reasoning, Deductive Reasoning). Group statistics with appropriate graphics are also provided.

Student Feedback: A printable results report is provided to each test taker upon completion of the test, at the discretion of the test administrator.

Other pertinent information about the assessment tool:

Insight Assessment provides staff consultation to each customer to optimize your selection of testing options, testing design, and results delivery.

What research studies that have been conducted to validate the assessment tool?

The CCTST family of instruments, which includes the many versions of the CCTST, as well as the BCTST, HSRT, MDCTI, LSRP and the TER, have repeatedly demonstrated their content, concurrent, predictive, and criterion validity, the strongest form of validity. Evidence for the validity and reliability of these instruments is provided by peer-reviewed research reports and posted educational reports numbering into the thousands. A partial list of research documenting use of the CCTST to capture gains in learning outcomes, predicting success in workplace transition, performance on professional licensure examinations, and evaluating the effectiveness of teaching and learning techniques is included in each test manual and is posted on our website. Further information about item development, the structure of the instrument, and related validation studies is proprietary.

Insight Assessment has a wide variety of assessment tools that include:

- California Critical Thinking Skills Test
- Business Critical Thinking Skills Test
- California Critical Thinking Disposition Inventory
- Professional Judgment Rating Form
- Test of Everyday Reason
- Health Science Reasoning Test
- Legal Studies Reasoning Profile
- Quant Q

For more information, contact Insight Assessment directly. Use the handy “Contact us” option on the website www.insightassessment.com or telephone an agent for assistance: 1-650-697-5628
PRODUCT: ETS® iSkills Assessment

COMPANY: ETS

DESCRIPTION OF PRODUCT:
The ETS iSkills Assessment is a performance-based, externally-validated measure of information literacy in digital environments - a competency outlined in CRF2.2(a). The iSkills Assessment is aligned with the nationally recognized ACRL Standards and generates data that can be used for benchmarking, an Educational Effectiveness Plan, and other WASC initiatives.

GRADUATION PROFICIENCIES ASSESSED:

<table>
<thead>
<tr>
<th>Written Communication</th>
<th>Oral Communication</th>
<th>Critical Thinking</th>
<th>Quantitative Skills</th>
<th>Information Literacy</th>
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Other: Digital Fluency/ICT Literacy

FORMAT OF PRODUCT:

<table>
<thead>
<tr>
<th>Multiple Choice</th>
<th>True/False</th>
<th>Short Answer</th>
<th>Essay</th>
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<table>
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<tr>
<th>Problem Sets</th>
<th>Oral</th>
<th>Performance</th>
<th>Matching</th>
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OTHER: Scenario-based

HOW ARE SCORES REPORTED?

- Norm/Group Referenced ☑
- Criterion/Standards Referenced ☑

DESCRIBE HOW THE NORMS ARE SET:

Statistical equating procedures are applied after the requisite number of students at a representative sample of institutions have administered the assessment. Norms are based on the self-selected sample of institutions which choose to implement the instrument. Statistical equating ensures that scores on a new version of the assessment are comparable to scores on previous versions of the assessment. Criterion-referenced standard setting - which employs panels of experts in information literacy - determine the level of proficiency test takers at different stages of academia or career should demonstrate. ETS will begin offering a certificate to test takers who achieve at or above a certain level of proficiency.

WHAT LEVEL/S DOES THE ASSESSMENT TOOL TARGET:

Undergraduate, Graduate, and Pre-College (beginning at Grade 10 level)

WHAT IS THE COST PER STUDENT INCLUDING ANCILLARY COSTS?

There are NO setup/registration/account costs to the institution. The individual assessment prices are discounted based on volume purchased as follows:

- $20 per test-taker for first 500
- $19 per test-taker for 501 to 1000
- $18 per test-taker for 1001 and above
Describe how the tool provides feedback:

iSkills generates performance feedback for the individual test taker which indicates what they were asked to do and how they performed on each task in comparison to the scoring rubric. ETS aggregates this performance feedback into qualitative and quantitative reporting formats which compare program/cohort/institution-level performance against a reference group of other iSkills user institutions.

Other pertinent information about the assessment tool:

- Secure, web-based assessment can be administered anytime, anywhere.
- Must be administered in a proctored setting.
- Tests consist of 14 short tasks and require 1 hour to administer (not including a 10-minute biographical questionnaire which can be completed by the test taker in advance of the test administration). Scoring is fully automated. Test taker will receive notification of the availability of their score via email.
- Backed by ETS’ 60+ years of creating high-quality, research-based assessments

What research studies that have been conducted to validate the assessment tool?

More than a dozen validity studies have been conducted over the last six years. A sample of these studies appears on the ETS iSkills website: http://www.ets.org/iskills/about/research/

Representative: Arthur Ruzzano - Western Region Manager, Higher Education
Email: aruzzano@ets.org
Phone: 310-944-4034
Website: www.ets.org/iskills
**PRODUCT:**
ETS® Proficiency Profile

**COMPANY:**
ETS

**DESCRIPTION OF PRODUCT:**
The ETS® Proficiency Profile assesses written communication, quantitative skills, and critical analysis of data and argument - three competencies outlined in CRF 2.2(a). The ETS® Proficiency Profile is the only objective test of academic skills that: measures these valuable skills in a single convenient test; delivers both norm-referenced and criterion-referenced scores — for use in your data portfolio or as part of an Educational Effectiveness Plan; and, is backed by ETS’s 60+ years of experience in creating high-quality, research-based assessments.

**GRADUATION PROFICIENCIES ASSESSED:**

<table>
<thead>
<tr>
<th>Written Communication</th>
<th>Oral Communication</th>
<th>Critical Thinking</th>
<th>Quantitative Skills</th>
<th>Information Literacy</th>
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Other: Reading

**FORMAT OF PRODUCT:**

<table>
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<tr>
<th>Multiple Choice</th>
<th>True/False</th>
<th>Short Answer</th>
<th>Essay</th>
<th>Optional</th>
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</table>

**HOW ARE SCORES REPORTED?**

- Norm/Group Referenced ✔
- Criterion/Standards Referenced ✔

**DESCRIBE HOW THE NORMS ARE SET:**
Statistical equating procedures are applied once a requisite numbers of students and institutions have administered the assessment. Norms are based on self-selected institutions. Statistical equating ensures that scores on new versions are comparable to previous versions. Each year ETS publishes comparative data based on all test takers and institutions using the instrument over the previous five years. This volume of data promotes disaggregation of data at both class level (Freshman, Sophomore, etc.) and Carnegie classification. Institutions can also select a peer reference group from a list of other ETS Proficiency Profile users. ETS can provide learning gains or value-added calculations in accordance with the Voluntary System of Accountability (VSA) requirements.

**WHAT LEVEL/S DOES THE ASSESSMENT TOOL TARGET?**
Undergraduate

**WHAT IS THE COST PER STUDENT INCLUDING ANCILLARY COSTS?**
- There are NO setup/registration/account costs to the institution.
- The individual assessment prices are discounted based on volume purchased and range from $16.50 (per test) to $14.50 (for 1,000 or more tests) for the Standard Form test and from $14.50 (per test) to $12.50 (for 1,000 or more tests) for the Abbreviated Form test.
- Choice of Standard or Abbreviated Form test will be based on whether or not the test will be used solely for group assessment or for individual student assessment as well.
PRODUCT: ETS® Proficiency Profile
COMPANY: ETS

DEScribe how the tool provides feedback:
Proficiency classifications - a criterion-referenced score - show areas of strengths and weaknesses for students or groups of students. Each skill area is divided into levels of difficulty which are associated with discrete sets of competencies. This adds a level of refinement in interpreting results. Students will not merely be “proficient” or “not proficient” in a skill. (For example, student may be “proficient” at Reading Level 1 but “not proficient” at Reading Level 2.) Multiple indicators in each skill area will help pinpoint those specific competencies within each skill area with which students may be having difficulty. The skills measured by ETS Proficiency Profile and the lists of competencies associated with each level of difficulty are detailed on the ETS website: http://www.ets.org/proficiencyprofile/about/content

Additionally, ETS offers an Item Information Report which shows group performance on a question-by-question basis - an excellent tool for opening up a dialogue with instructional experts.

Other pertinent information about the assessment tool:
• Both proctored and non-proctored administration available (ETS Proficiency Profile is the only commercially available assessment with a non-proctored version - essential for reaching students that may not come to campus regularly.)
• Available in both paper-pencil and online (secure web-based) administration formats
• Choose from Standard (2-hour) or Abbreviated (40-minute) versions (Both versions generate all norm-referenced and criterion-referenced scores for data analysis by institution administrators.)
• Standard and Abbreviated versions are statistically equated to each other
• Ability to include up to 9 additional demographic and 50 additional program related locally authored questions to gather information specific to your institution
• An optional essay component can be added to either the Standard or Abbreviated tests
• Optional premium reports provide question-level detail, customizable peer reference group reports, or even a complete data export
• Backed by ETS’ 60+ years of experience creating high-quality, research-based assessments

What research studies that have been conducted to validate the assessment tool?
The most recent validity study compares ETS Proficiency Profile to two other commercially available assessments of core general education skills. The 18-month study (known as the FIPSE Test Validation Study as it was funded by FIPSE) can be found on the website of the Voluntary System of Accountability.

Representative: Arthur Ruzzano - Western Region Manager, Higher Education
Phone: 310-944-4034
Email: aruzzano@ets.org
Website: www.ets.org/proficiencyprofile
Your partner for continuous Improvement

LiveText has been the leading service provider for learning outcomes assessment in higher education since 2001. Today, thousands of administrators at more than 500 institutions use LiveText’s comprehensive, web-based platform in individual programs and campus wide for strategic planning and to effectively measure student learning, report on outcomes, and prepare accreditation self-studies.

One Tool  ◆  Multiple Solutions  ◆  Customized to Your Needs

- Campus-Wide Assessment
- Programmatic Assessment
- Accreditation Management
- Field Experience Management
- e-Portfolios

Creating a Culture of Data-Driven Information at your Institution

Synthesizing information about student learning can be daunting and expensive. LiveText’s electronic platform is engineered to effectively and efficiently plan, collect, and showcase strategic plans, program review documents, and accreditation self-studies so it doesn’t have to be. You can achieve a coordinated campus-wide assessment process that informs decision-making using our all-inclusive toolkit that facilitates a comprehensive, centralized assessment process to unify the whole campus—where every division, every department, and every faculty member has access to the assessment planning, collecting, and reporting services.

Plan Strategically

- Use any existing Student Information System on your campus, including Datatel, Banner, PeopleSoft, or Jenzabar, to upload complete catalog, demographic profile, and roster imports to ensure accurate data collection and eliminate the need to manage separate databases
- Integrate seamlessly with our Single Sign-On Technology for Blackboard® 9.1 SP4+ and 8.x and Moodle™1.9 and 2.0
- Define clear measures and targets to achieve institutional goals...use the LiveText Library of best-practice assessment materials and rubrics, including the AAC&U’s metal rubrics, to define institutional and general education outcomes
- Design formative and summative evaluations to assess whether students are meeting stated learning outcomes and goals
- Develop action plans based on collected data
- Document movement towards fulfilling the institutional mission

Assess and Collect

- Manage outcomes at multiple levels by identifying, aligning, and mapping organizational goals, strategic plans, general education principles, program and course outcomes, and non-academic outcomes
- Develop, align, and distribute rubrics for all programs and courses
- Assess based on Outcomes, Performance, Courses
- Use Multiple Assessor, Blind Assessing, or Third Party Assessing options
- Use student and faculty e-Portfolios to assess progress
- Gather campus-wide datasets on faculty credentials and operational data
- Create and distribute course, instructor, student, alumni, and employer surveys for data collection
Report and Analyze

- Generate powerful data reports with aggregated summaries and drill downs for comprehensive analysis
- Filter reports to review specific programs, course effectiveness, and student progress to evaluate campus-wide efficiency
- Prepare reports annually or by term on institutional outcomes and goals for departments, programs, majors, and both academic and non-academic divisions
- Discover connections between courses and learning outcomes and uncover gaps in course sequences
- Develop a composite view of student learning both inside and outside the classroom
- Use the data to make informed decisions and take action

Manage Accreditation

- Close the Loop on your assessment process by using acquired data to inform action plans for improvement, and then document the results of those actions – creating a repeatable strategy to continuously achieve mission-critical tasks
- Compile information in an online Self Study report, Systems Portfolio, or Quality Enhancement Plan
- Archive reports and meeting minutes to develop longitudinal self studies
- Easily build a customized ExhibitCenter™ for your institution with links to reports to showcase all assessment evidence, reports, actions, and institutional self studies

LiveText has helped hundreds of programs achieve Professional and Third-Party Accreditations:

- NCAE, Nation Council for Accreditation of Teacher Education
- TEAC, Teacher Education Accreditation Council
- CAEP, Council for the Accreditation of Educator Preparation
- ABET, Accreditation Board for Engineering and Technology
- AACSB, Association to Advance Collegiate Schools of Business
- ACBSP, Accreditation Council for Business Schools and Programs
- IACBE, International Assembly for Collegiate Business Education
- AACN-CCNE, American Association of College of Nursing - Commission on Collegiate Nursing Education
- AACPE-ACPE, Accreditation Council for Pharmacy Education
- ACOTE, American Occupational Therapy Association
- ADA, American Dental Association

LiveText has helped hundreds of institutions achieve Regional Accreditations, specifically:

- WASC, Westin Association of Schools and Colleges, ACCJC - ACJS, Accrediting Commissions for Community and Junior Colleges

"With the adoption of both institutional and general education learning outcomes, LiveText allowed us to easily gather and report on data that told us what our students know and understand about multiple outcomes, such as effective communication. These results are useful for both institutional improvement and regional WASC accreditation."

Dr. Ruth Heinrichs, DPA
Director of Institutional Effectiveness
Point Loma Nazarene University
Institutional Effectiveness Solutions for Higher Education

TracDat®

TracDat is an easy-to-use enterprise software solution that provides a framework for managing multiple aspects of institutional planning and assessment from a single system.

> **Institutional Assessment**
  - Provides the platform for documenting and assessing outcomes at the course, program and institutional levels such as General Education Competencies and Institutional Learning Outcomes
  - Unifies quantitative data generated from assessment tools such as tests, rubrics, surveys etc., with the qualitative planning process documented within TracDat.
  - Enables ongoing, enterprise-wide visibility into progress toward targeted improvements, enabling faculty and staff to efficiently manage strategies and monitor activities
  - Presents student data in an actionable context that can link multiple assessment goals to each outcome

> **Strategic Planning**
  - Adds clarity to complex organizational relationships, and offers a foundation for informed decision-making
  - Ease-of-use encourages faculty and staff involvement in the strategic planning process
  - Facilitates the identification of trends that can be leveraged to improve strategic planning initiatives

> **Accreditation Support**
  - Links ongoing academic achievement to organizational goals at the course, program and institutional levels
  - Easily gather and package evidence of improvement to strengthen the accreditation process

> **Institutional Effectiveness**
  - Advances a culture of evidence by providing organizations with a “single version of the truth” that can be reflected on consistently across the organization
  - Provides visibility into complex institutional networks and enables the identification of trends and patterns
  - Gives context to the relationship of individual initiatives to goals at the course, program and institutional level

**The TracDat SharePoint Option**

The TracDat SharePoint Option (TSO) integrates TracDat with Microsoft’s SharePoint platform, bringing the most relevant and meaningful data to the forefront of faculty and staff’s daily work environment.

> TSO enhances TracDat’s ability to “close the loop” between planning and action by presenting data in a modular, visual format; promoting change by positioning plans next to results.
> It establishes a dynamic, data-rich environment that gives users a context in which to view relevant data, ask questions, provide input, take action, and measure results, facilitating a clear path to institutional effectiveness and sustaining a culture of assessment.
> TSO gives users a robust view of their organization by presenting both qualitative and quantitative information for collaborative analysis. Plans and data from TracDat are presented in a SharePoint framework that may also display data from various administrative and academic systems and assessment tools.

**iWebfolio®**

iWebfolio is the most flexible, web-based electronic portfolio solution on the market; it supports today’s needs and grows with you. iWebfolio’s flexible framework supports lifelong learning across educational institutions, employers, and professional organizations.

Users can create and manage an unlimited number of portfolios to meet a variety of educational and professional needs.

> **Learning Portfolios** enable rich reflection and feedback to support formative evaluations, while facilitating the collection of evidence for program improvement.
> **Assessment Portfolios** demonstrate competencies supporting summative evaluations in a traditional learning environment or to receive credit for Prior Learning.
> **Presentation Portfolios** enable the showcase achievement for a variety of academic and professional purposes.

iWebfolio supplies institutions with data for assessment, while giving individuals a space to learn and demonstrate achievement. Institutions can configure e-portfolio templates to include rubrics and measures that will provide them with the specific information necessary for quality improvement. Faculty and staff create, share and manage templates within an institution’s exclusive library and, optionally, an extended customer catalog.

**About Nuventive**

Nuventive is a leading provider of solutions for assessing, managing and demonstrating continuous improvement in education. Our mission is to provide individuals, educators and organizations with the tools and services they need to effectively demonstrate achievement throughout the lifelong learning process. Contact us at learnmore@nuventive.com.
Effective Process Management for WASC

Accountability Management System

The Accountability Management System (AMS) by TaskStream is a process management and workflow platform designed specifically for colleges and universities to manage:

- Strategic planning
- Mission, vision and goal alignment
- Student learning outcomes
- Assessment planning
- Proposal, CPR and EER development
- Curriculum mapping

AMS supports the workflow of the entire accreditation life-cycle efficiently and effectively. WASC institutions use AMS to design and manage processes that increase transparency, reduce paperwork, promote continuous improvement, and engage campus faculty and staff.

Institutional Proposal, CPR and EER Management

- A clear and consist institutional assessment framework and workspaces for each unit provide visibility into the data necessary for preparing quality accreditation documents.
- Collaborative workspaces make it easier for key stakeholders to prepare and review your Institutional Proposal, Capacity and Preparatory Review, and Educational Effectiveness Review.
- Document and workflow management capabilities enable the management of exhibits, as well as the Data Portfolio.

Educational Effectiveness and Student Learning

- Promote a culture of evidence and continuous improvement with tools for documenting assessment at the course, program, and institutional level.
- Document and organize program mission statements, student learning outcomes, outcome alignment, curriculum maps, measures, and assessment results.
- Close the loop with action plans tied directly to specific learning outcomes and objectives.

Strategic Planning

- Engage your entire organization in institutional reflection and planning.
- Identify strategic objectives and priorities to which units and programs can align their work and associate budget requests.
- Create internal transparency and demonstrate sustained evidence-based participatory discussion and decision making.
Learning Achievement Tools

The Learning Achievement Tools (LAT) by TaskStream facilitates the demonstration and assessment of student performance based on established outcomes and standards. The tools enable customized competency assessment and reporting and offer a wide range of methods to demonstrate learning.

Outcomes Assessment

- Collect artifact and reflection requirements according to program or course specifications in the form of text, images, videos and files of all types.
- Create and use custom rubrics and form-based assessment instruments to score work and ensure consistent data collection.
- Attach standards from a comprehensive database of local, state, national and international standards, outcomes and competencies.

Performance Reporting

- Aggregate, analyze and present assessment results to examine individual, programmatic and institutional success.
- Create electronic exhibit rooms to share data online and export reports to Excel for further analysis.
- Examine inter-rater reliability with reports that display scores from multiple evaluators side-by-side and include agreement and correlation calculations.

e-Portfolios

- Provide opportunities to demonstrate knowledge and reflect on personal development.
- Share work and solicit feedback — publish to the Web, password protect, export to PDF and download portfolios.
- Archive digital collections of resources to organize files, links and media.

Field Placement and Internship Management

- Maintain custom databases of information about field sites, staff and individual student or candidate placements.
- Report on demographics of placement sites and track placements for individual students.

Surveys

- Create custom surveys to poll current students and faculty, alumni, employers and other external stakeholders.
- Analyze responses with graphical reports, compare responses over time and drill down to see individual responses.
RESOURCES

The following documents have been compiled to provide context and understanding around assessing graduation proficiencies. They are by no means an exhaustive list, but a good place to continue exploring. The documents are broken into the following categories.

1. WASC Senior Commission Resolution..pg. 33
2. Introductory Materials..pg. 37
3. Core Competencies
   a. Written Communication..pg. 42
   b. Oral Communication..pg. 46
   c. Critical Thinking..pg. 50
   d. Quantitative Skills..pg. 54
   e. Information Literacy.. pg. 66
4. Assessment Methods
   a. Overview..pg. 82
   b. Portfolios..pg. 90
   c. Capstones..pg. 98
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   e. Embedded and Signature Assignments..pg. 110
   f. Commercially Available Standardized Tests..pg. 118
5. Literature on Learning and Assessment..pg. 126
At its November 3 meeting, the Commission conducted a public hearing on proposed changes to the WASC accrediting process. The public hearing followed three regional forums and two webinars with participation from over 130 institutions. The Commission also received written comments from a number of institutional representatives, which were reviewed by the Commission. Based on the recommendations of the Redesign Steering Committee and feedback received from the region, the Commission discussed and adopted the following resolution:

- The Commission commends the work of the Steering Committee and the five Task Forces for engaging the 10 Commission Goals for the Redesign of the WASC Accrediting Process and developing recommendations for simplifying, shortening, and focusing the accrediting process. While much work lies ahead, the Commission acknowledges the foundation laid by all those involved in the process and the value of the feedback received on these proposed changes to date. Special commendation is extended to the Chair of the Steering Committee, Anna DiStefano, for her tireless work in coordinating and synthesizing the recommendations into a coherent framework.

- In adopting changes to the accrediting process, the Commission also wishes to acknowledge the work done by institutions in the region under the 2001/2008 Handbook of Accreditation. Steps taken by the Commission are intended to honor and build on these efforts.

- The Commission reaffirms its commitment to enhance its role as an agent of quality assurance and public accountability, and in so doing, to give greater attention to student success and student learning. The Commission also acknowledges the need to adapt its processes to the diverse range of institutions accredited and be cost-effective and value adding.

- In addition, the Commission expresses its appreciation to all those who attended the public forums and webinars and to those who submitted feedback on the proposed changes in order to make the WASC process more effective and responsive to both external and regional issues and concerns.

### SUMMARY OF ACTIONS

1. Transparency
2. Review of Retention and Graduation
3. Graduation Proficiencies for Undergraduate Degrees
4. Focusing on the Meaning, Quality and Rigor of the Degree
   - The Degree Qualifications Profile
5. Triennial Financial Reviews
6. Identifying Additional Criteria for For-Profits
7. Redesign of the Institutional Review Process
8. Timeframe for Implementation
10. Evaluating the New Accrediting Process
11. Responding to the Changing Ecology of Learning
12. Additional Actions

**Action to seek further comment**
External validation/benchmarking of graduation Proficiencies

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*Adopted November 3, 2011*
*Edited for clarity November 8, 2011*
Be it further resolved that, with respect to the following issues, the Commission takes the actions identified below:

1. **Transparency:** Effective with actions to be taken by the Commission at its June 2012 meeting and prospectively thereafter, the Commission will make action letters and the supporting team reports publicly available on its website for all accrediting visits. The team recommendation to the Commission will remain confidential. The Commission will provide a link on its website to any institutional response to the Commission action or team report. In furtherance of this action, the Commission shall revise all related policies including the Commission Policy on Disclosure of Accrediting Documents and Commission Actions, the Commission Code of Good Practice, and other policies and documents as needed, in the Handbook of Accreditation and other publications. In addition, the Commission acted to revise the definition of a formal Notice of Concern so that it will be a public action. Revisions to the relevant provisions in the Handbook of Accreditation will be circulated for review to the Executive Committee of the Commission by December 1, 2011 for approval of changes to these policies, to then be circulated to the region for comment with final action to be taken at the February 2012 Commission meeting.

2. **Review of Retention and Graduation:** The Commission authorizes the creation of an offsite review process to evaluate institutions’ narratives and numbers report identifying retention and graduation rates for undergraduate programs. All candidate and accredited institutions will be reviewed between 2013 and 2015. Half of institutions awarding undergraduate degrees will be reviewed in 2013 and half in 2014, with graduate programs being similarly divided for review in 2014 and 2015. Templates for data reporting, definitions of terms and the format for institutional submissions for institutions offering undergraduate degrees will be presented to the Commission for review and approval at its February 2012 meeting, circulated to the region for comment and discussed at the April ALO meeting held in conjunction with the 2012 Academic Resource Conference. The institutional presentation will include a self-review of retention and completion rates (and numbers) and external benchmarking to similar and/or best practice institutions, selected by the institution, along with plans and targets for areas of needed improvement.

3. **Graduation Proficiencies for Undergraduate Degrees:** Consistent with Criteria for Review 2.2 and 2.6, all institutions offering undergraduate degrees will be expected to demonstrate that their graduates have achieved the institution’s stated level of proficiency at least in the following five areas: written and oral communication, quantitative skills, critical thinking and information literacy. The institution has the responsibility to determine how each of the proficiencies is defined, the level of proficiency expected of students upon graduation, how the proficiency is to be assessed and to demonstrate that graduates consistently achieve or surpass the stated level of proficiency. Institutions are also expected to determine similar outcomes and levels of proficiency in the major or disciplinary field and in other areas determined by the institution to be important to fulfill its mission.

4. **Focusing on the Meaning, Quality and Rigor of the Degrees:** Building on the first paragraph of CFR 2.2 and CFR 1.2, which requires that institutions define the outcomes of degrees beyond the accumulation of courses and credits, the Commission expects that all institutions will articulate, as part of the institutional review process, the learning outcomes of the degree as a whole and demonstrate that there are processes in place to assure the meaning, quality and rigor of the degrees offered. The institution is responsible for defining how it will address these issues.
The Degree Qualifications Profile (DQP): The Degree Qualifications Profile (DQP) will be piloted through voluntary learning communities to assess its usefulness as a framework for assisting institutions to assess the quality of degrees or portions of degree programs. The pilot will run from 2012 to 2014 on a voluntary and optional basis. The Commission will share the results of the pilot at Commission meetings, sessions with ALOs and at other times during the Academic Resource Conferences. Based on the review of the pilot and further discussion within the region, the Commission will determine what uses of the DQP are appropriate for quality assurance.

1. **Triennial Financial Reviews:** The Commission approved the recommendations of the Financial Review Task Force to establish panels for public, nonprofit and for-profit institutions to review audit results and financial ratios on a triennial basis based on readily available information. Findings from these reviews will be incorporated as appropriate into the accrediting review process. Formal recommendations of the format of such reviews will be presented for Commission review and approval in February 2012.

2. **Identifying Additional Criteria for For-profit Institutions:** With the increasing number of for-profit institutions seeking and attaining WASC accreditation, the Commission charges the President to identify areas where additional criteria beyond the application of the Standards of Accreditation may be needed to address the distinctive elements of such institutions. A report is to be presented to the Commission on proposed changes at the February 2012 Commission meeting to be reviewed and approved for circulation to the region for comment.

3. **Redesign of the Institutional Review Process (IRP):** The Commission approved the structure of the proposed redesign of the IRP, which will be a single, integrated process of a day-long offsite review followed by an onsite review that is framed by the findings of the offsite review. The onsite review will be conducted one semester, no later than two semesters, after the offsite review. Within the framework for meeting federal obligations, the Commission has committed to implementing different approaches for institutional review that will respect institutional diversity, build on the previous work of institutions to address the 2001/2008 Standards of Accreditation, be cost-effective and emphasize student success and student learning, sustainability and needed areas for improvement. The Commission has instructed the staff to develop one or more formats for this new review process adapted to the previous accrediting history of the institution and issues arising from previous reviews (EER, special visits, interim reports, substantive change actions, etc.). The institution’s report for this review process would include such elements as: current issues based on the institution’s self-review under the Standards, the institution’s response to any findings from the offsite retention/graduation and the financial reviews and reports on graduation proficiency (#3 above) and the meaning, quality and rigor of degrees (#4 above). Plans for implementation will be presented to the Commission for review at its February 2012 meeting for circulation to the region and at the 2012 ARC, and considered, with any modifications, for final adoption at the June 2012 Commission meeting.

4. **Timeframe for Implementation:** The redesigned IRP will be implemented for all accredited institutions effective fall 2013. The offsite review of retention and graduation will commence in spring 2013. The date of implementation for the triennial financial reviews will be set by the Commission upon approval of the format for these reviews in February 2012. Institutions seeking candidacy and initial accreditation will continue to use the process outlined in the Commission publication, How to Become Accredited. The date of the institution’s offsite review will be the date previously scheduled by the Commission for the Capacity and Preparatory Review (CPR) for all accredited institutions at the time of the completion of their review under the 2001/2008 Handbook. Institutions scheduled for their CPR in fall 2012 will be rescheduled for spring or fall 2013. Institutions scheduled for spring 2013 CPR visits will be given the option to proceed with a two-visit approach under the 2001/2008 Handbook or to pilot the redesigned IRP.
1. **Review of the 2008 Standards of Accreditation and Commission Policies:** The Commission requests that the Steering Committee review the 2008 Standards of Accreditation for refinement. Based on survey results and feedback to the Commission, the Commission does not believe major changes are needed, but instead, editing for simplification and clarification. The Commission requests that the Steering Committee prepare preliminary findings for discussion at the February 2012 meeting, to circulate proposed changes to the region following that meeting for comment and for further review at meetings at the 2012 ARC, with final changes adopted by the Commission in June 2012. The President is charged to develop a process for review and updating of Commission policies, using to the extent possible, the same timeline as the revision of the Standards.

2. **Evaluating the New Accrediting Process:** The Commission is committed to ongoing review of the impact of these changes and making improvements to the accrediting process as needed. To this end, the Commission will establish an interim review process in 2016 to evaluate the first round of reviews under the redesigned institutional review process and undertake a formal external review of these changes in 2019-20.

3. **Responding to the Changing Ecology of Learning:** The Commission recognizes that the ecology of learning and of higher education is changing rapidly. It requests a formal report from the Task Force on the Changing Ecology of Learning at its February 2012 meeting on how an openness to change and innovation can be built into the redesigned accrediting process, Standards and policies.

4. **Additional Actions:** The Commission recognizes that not all goals set by the Commission in November 2010 have been addressed and charges the President to develop a plan for addressing these goals. These include developing a public statement and/or quality matrix following accreditation review; setting additional expectations for institutional reporting of information; and considering the development of levels of accreditation.

**Action to Seek Further Comment**

**External Validation/Benchmarking of Graduation Proficiencies:** In its articulation of goals for the redesign of the accrediting process in November 2010, the Commission called for external benchmarking of key graduation proficiencies to provide a more consistent approach to evaluating student learning. This approach was affirmed by the Task Force on Levels of Learning and the Degree Qualifications Profile, which recommended that there be external validation or benchmarking of writing, critical thinking, and quantitative skills at graduation. This recommendation was modified by the Steering Committee to propose that at least two of the five graduation proficiencies in CFR 2.2 (see #3 above) be externally validated or benchmarked. In discussions throughout the region, the Commission received a range of responses from support for this proposal to expressions of concern. The Commission considered making external validation of graduation proficiencies optional, but there was a range of views within the Commission about how institutions would demonstrate effective learning without external comparisons outside the department or institution. The Commission decided, therefore, to continue to study this issue and to invite additional input from the region within the framework of the other actions taken by the Commission, especially #3 above, regarding the role of external validation, methods for undertaking validation and alternative approaches if external validation or benchmarking were not required, but made optional. Input from institutions will be solicited and received until January 15, 2012. The Commission has requested that the President prepare additional reflections on this matter. The Commission will discuss and act on this matter at its meeting in February 2012. The Commission also authorizes the staff to proceed with the scheduled “Resource Fairs” in Northern and Southern California to learn more about available approaches that could be used, whether optional or required.

Additional information may be found on the WASC website at www.wascsenior.org or by contacting Jessica Worche, Project Manager for Accreditation Redesign at jworche@wascsenior.org.
Colleges Increase Efforts to Measure What Students Learn, Survey Finds (1)

By David Glenn

Colleges appear to be doing more to assess student learning, according to a report scheduled for release today by the Association of American Colleges and Universities.

The report, which is based on a survey of academic officers at 433 of the association’s member institutions, says that 78 percent of those institutions have established common learning goals for all of their undergraduates, and that 72 percent try to assess learning outcomes across the curriculum. The learning goals mentioned in the survey include both subject-specific knowledge in science and the humanities, and general skills like critical reasoning and oral communication.

But the report also suggests that many college leaders are worried that their students do not know about the learning outcomes they are supposed to achieve. And—in a discovery that will cheer some education advocates and dismay others—the survey found that relatively few colleges are using external learning assessments that might allow institutions to compare their performance with that of their peers.

The survey was developed in parallel with a project that the association calls “Liberal Education and America’s Promise,” which promotes the value of the traditional liberal-arts framework, as distinct from narrowly vocational college programs.

One theme of that project is that colleges should tie student-learning assessment to their own curricula rather than anchor their assessments to national standardized tests. That approach would allow colleges to maintain their particular identities, and would also allow student learning to be organically nurtured within academic departments, said the association’s president, Carol Geary Schneider, in an interview last week.

“Overwhelmingly our institutions are going in a direction that allows them to assess the quality of their students’ performance against the expectations of their own curriculum,” Ms. Schneider said.

She cited especially the growing number of institutions using electronic portfolios, which allow students to demonstrate mastery of particular skills.

(In the survey, 57 percent of colleges reported using electronic portfolios, and 32 percent said they use such portfolios to assess learning.)

Assessing the Assessments

Such highly particularized learning assessments have sometimes been criticized as inadequate. In recent years, some education advocates have argued that whatever the merits of colleges’ internal assessment systems, they should also find ways to compare their students’ learning with that of their peers. (That argument comes in several flavors, but one version is associated with Kevin Carey, a policy analyst and Chronicle columnist.) In the new report, only 26 percent of institutions reported that they used standardized...
Colleges Increase Efforts to Measure What Students Learn, Survey Finds (2)

national tests of general skills, and only 16 percent reported that they used standardized national tests of general knowledge. Those figures may be artificially low, however, because of the way the survey was designed. The only institutions that were asked explicitly about whether they used standardized national assessments were those answering yes to a previous question about whether they “assess cumulative learning outcomes in general education across multiple courses.” Fifty-two percent of the respondents did so. Among the 48 percent that answered no, it is likely that some used standardized national assessments, even though this group was not asked about them.

In an e-mail message to The Chronicle on Monday, Richard J. Shavelson, a professor of education at Stanford University and author of a forthcoming book on assessing student learning, said he was surprised that the association’s survey did not place greater emphasis on colleges’ use—or lack thereof—of external assessment tools.

“Learning assessment is incomplete when only internal formative assessment or only external summative assessment is used,” Mr. Shavelson wrote. “Both are needed and need to be aligned with one another. Without this combination, campuses may be fooling themselves and their external constituencies as to the progress they are making in improving student learning.” (Mr. Shavelson added, however, that he dislikes the idea of “publishing league tables” ranking colleges, as Mr. Carey and others have advocated.)

Ms. Schneider replied that she did not believe there was actually much distance between her association’s position and Mr. Shavelson’s. The college association has nothing against external assessments, she said—as long as they are closely married to learning goals that faculty members themselves have defined.

“The survey shows why colleges and universities have been so resistant to the use of a single test to report ‘value added’ from college,” Ms. Schneider said. “With so much going on at the departmental level to define goals and assess students’ cumulative learning over time—including learning on general outcomes such as writing or critical thinking—faculty rightly observe that a single test cannot provide much insight into what’s going right or wrong in specific fields.”

One disheartening element of the new report, in Ms. Schneider’s view, is that few respondents said they believed that their students knew about and understood their institution’s learning goals. Among colleges that have established a common set of learning goals for all undergraduates, just 5 percent of respondents said they believed that “almost all” students knew about and understood those goals, and only 37 percent said a majority of their students understood the goals.

“We don’t want these goals to go the way of New Year’s resolutions, carefully thought through but never actually achieved,” Ms. Schneider said. “If we want students to achieve these goals, then they need to understand what’s expected, and how their courses might help them achieve the kind of real-world competencies that we want from a college education.”
Why Do I Like Assessment? Let Me Count the Ways (1)
By Theodore C. Wagenaar

OK, I admit it: I like assessment. I like it because it encourages faculty members to think more carefully about what they do, how they do it, and why they do it that way. I like it because it helps raise questions about how our teaching strategies affect learning outcomes. And I like it because in the process, we discover more about how our teaching fits in with programs and curricula beyond our own courses. Good-quality assessment simply asks about our goals, our instructional procedures, and the link between both of those and learning.

However, my experiences as an external reviewer, workshop leader, and member of many campus program-review and program-assessment committees have made it clear to me that most academics resist assessment in general and on principle. Some professors dislike the scrutiny. Others feel that assessment reflects corporate encroachment and a threat to academic freedom. Still others fear a homogenization of the educational experience.

True, many campus-level assessment efforts are flawed—often because they don’t engage faculty members and don’t carefully examine faculty work and its connection to learning. In my experience, many of the letters that administrators write to departments after a program review are brief, lack a nuanced understanding of the department under review, and inadequately address curriculum quality and coherence. Many departments receive little institutional support for surveying students, and all too often, anecdotal evidence is relied upon as fact.

So some skepticism on the part of the faculty is healthy. It can, for example, prevent institutions from moving too quickly on a new strategy. Indeed, many a professor has lived through an assessment venture—often plopped onto campus with little background work—that was initiated by an administrator who left soon thereafter. The result? Heightened faculty cynicism and reduced commitment to future assessment efforts.

But too much cynicism is unwarranted. Most administrators I have met are hungry for faculty engagement and indeed fear that too few faculty members are interested. Besides, given the often short tenure of many administrators, the faculty must play a central role in making assessment part of the campus culture. If professors lend their expertise and experience, and engage in discussions about assessment early on (both formally and informally), they can help create meaningful programs capable of getting useful results.

The fact is that there are several good reasons for assessment. The most important, of course, is that it can and should improve our teaching and students’ learning. But too many assessment programs focus more on input than output, and they rely too heavily on student opinion. We need to look more carefully at what students can do using course and student portfolios.
Executed well, assessment encourages faculty members to articulate their course and assignment goals more clearly and to develop sound rubrics. That helps them think more broadly about overarching program goals, and how to measure students’ success in reaching those goals. That, in turn, typically leads to greater faculty interest in how classroom activities connect with academic performance. Asking what is important leads us to ask about what works, and both contribute to good-quality assessment, better teaching, and greater learning.

Take one common preassessment scenario: Most of the students in a given department are unable to identify key program goals. For example, many sociology students I have interviewed stumble when I ask them to link three of their program goals to anything happening in the world today. And professors who teach senior-level courses are often disappointed with the inability of many of their students to make substantive and cumulative connections across their courses.

At many institutions I’ve visited, assessment quickly showed that program goals noted in the handbook failed to materialize in individual courses. At one college, the stated goals emphasized the skills that students would gain for dealing with real-world problems—but interviews and reviews of student papers indicated that while the students were doing volunteer work, they were failing to use their disciplinary knowledge to analyze and critique their experiences. A review of that department’s internship course, too, showed a weak focus on connecting program goals to real-world experiences.

Assessment can help. It can teach faculty members to work together to teach and assess those learning goals. For example, many sociology programs stress the role of research methods across courses, but my interviews with students suggest that students generally fail to apply their knowledge of those methods in other courses. In part that happens because instructors do not reinforce such knowledge and skills. Assessing both the courses and students’ knowledge will highlight such gaps and help transform their cumulative experience by encouraging instructors to improve both individual courses and the learning gained across courses.

The entire department would benefit as all courses became part of a well-thought-out whole. Professors gain classes full of prepared students, and students report their highest levels of satisfaction and learning in departments where faculty members collectively assume responsibility for the entire curriculum and its assessment. It takes a village of engaged faculty to raise successful students. That same village can provide better assessment than can one designated person, and can make better use of the results.

So what are the most essential elements of quality assessment?

One is student engagement. We usually leave students out of discussions of policies and initiatives that affect them. That’s a mistake. Students can tell us how and why certain courses and programs are successful (or not), and can provide insights on how to improve their teaching and assessment. Focus groups with our students showed how the clarity of the syllabus enhanced their ratings of how well their learning was assessed.
Why Do I Like Assessment? Let Me Count the Ways (3)

Another is the use of effective rubrics. Rubrics help students see the organization and goals of a course more clearly, and help others assess the course and student learning more accurately. Students in program-review visits I’ve led have told me that they frequently hear about critical thinking, but are seldom instructed on how to do it, and even more rarely evaluated on it concretely. Students can and will provide useful, explicit feedback if we ask and then demonstrate that we use their answers to enhance their learning.

Measuring critical thinking is hard. We can’t just ask students if they feel that they’ve learned how to think critically—almost all of them will say yes, because we constantly tell them it is important. A good model exists in an innovative program at Washington State University, which approached the problem by describing discrete elements of critical thinking that could be applied across disciplines, then gave specific examples.

Such successes can lead to conversations with colleagues both on and off campus, and help promote a collective responsibility for teaching and assessing critical thinking as well as other general-education and disciplinary goals. Over time, that can help us discover how teaching and learning strategies are connected with students’ progress.

Academic responsibility must complement academic freedom. Faculty members prize their independence and autonomy, and they are quick to label any “outside” influences—especially assessment—as an infringement on their academic freedom. But that independence can sometimes be detrimental to students, because it diminishes a collective responsibility for student learning. Assessment brings into focus what students should learn in courses and programs and how successful we are as individual teachers and as faculties.

Let’s not do assessment just because it is mandated. Let’s not do it to make accreditation agencies happy or because everyone else is doing it. Let’s do it to improve learning.

Theodore C. Wagenaar is a professor of sociology and a faculty associate in the Center for the Enhancement of Learning, Teaching, and University Assessment at Miami University of Ohio.
Written Communication VALUE Rubric

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can by shared nationally through a common dialog and understanding of student success.

Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

Framing Language

This writing rubric is designed for use in a wide variety of educational institutions. The most clear finding to emerge from decades of research on writing assessment is that the best writing assessments are locally determined and sensitive to local context and mission. Users of this rubric should, in the end, consider making adaptations and additions that clearly link the language of the rubric to individual campus contexts.

This rubric focuses assessment on how specific written work samples or collections of work respond to specific contexts. The central question guiding the rubric is «How well does writing respond to the needs of audience(s) for the work?» In focusing on this question the rubric does not attend to other aspects of writing that are equally important: issues of writing process, writing strategies, writers’ fluency with different modes of textual production or publication, or writer’s growing engagement with writing and disciplinarity through the process of writing.

Evaluators using this rubric must have information about the assignments or purposes for writing guiding writers’ work. Also recommended is including reflective work samples of collections of work that address such questions as: What decisions did the writer make about audience, purpose, and genre as s/he compiled the work in the portfolio? How are those choices evident in the writing -- in the content, organization and structure, reasoning, evidence, mechanical and surface conventions, and citational systems used in the writing? This will enable evaluators to have a clear sense of how writers understand the assignments and take it into consideration as they evaluate

The first section of this rubric addresses the context and purpose for writing. A work sample or collections of work can convey the context and purpose for the writing tasks it showcases by including the writing assignments associated with work samples. But writers may also convey the context and purpose for their writing within the texts. It is important for faculty and institutions to include directions for students about how they should represent their writing contexts and purposes.

Faculty interested in the research on writing assessment that has guided our work here can consult the National Council of Teachers of English/Council of Writing Program Administrators’ White Paper on Writing Assessment (2008; www.wpacouncil.org/whitepaper) and the Conference on College Composition and Communication’s Writing Assessment: A Position Statement (2008; www.ncte.org/ccce/resources/positions/123784.htm)
Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Content Development**: The ways in which the text explores and represents its topic in relation to its audience and purpose.

- **Context of and purpose for writing**: The context of writing is the situation surrounding a text: who is reading it? who is writing it? Under what circumstances will the text be shared or circulated? What social or political factors might affect how the text is composed or interpreted? The purpose for writing is the writer’s intended effect on an audience. Writers might want to persuade or inform; they might want to report or summarize information; they might want to work through complexity or confusion; they might want to argue with other writers, or connect with other writers; they might want to convey urgency or amuse; they might write for themselves or for an assignment or to remember.

- **Disciplinary conventions**: Formal and informal rules that constitute what is seen generally as appropriate within different academic fields, e.g. introductory strategies, use of passive voice or first person point of view, expectations for thesis or hypothesis, expectations for kinds of evidence and support that are appropriate to the task at hand, use of primary and secondary sources to provide evidence and support arguments and to document critical perspectives on the topic. Writers will incorporate sources according to disciplinary and genre conventions, according to the writer’s purpose for the text. Through increasingly sophisticated use of sources, writers develop an ability to differentiate between their own ideas and the ideas of others, credit and build upon work already accomplished in the field or issue they are addressing, and provide meaningful examples to readers.

- **Evidence**: Source material that is used to extend, in purposeful ways, writers’ ideas in a text.

- **Genre conventions**: Formal and informal rules for particular kinds of texts and/or media that guide formatting, organization, and stylistic choices, e.g. lab reports, academic papers, poetry, webpages, or personal essays.

- **Sources**: Texts (written, oral, behavioral, visual, or other) that writers draw on as they work for a variety of purposes -- to extend, argue with, develop, define, or shape their ideas, for example.

**Definition**

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

*Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.*

**Definition**

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

*Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.*
<table>
<thead>
<tr>
<th>Context of and Purpose for Writing</th>
<th>Content Development</th>
<th>Genre and Disciplinary Conventions</th>
<th>Sources and Evidence</th>
<th>Control of Syntax and Mechanics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.</td>
<td>Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.</td>
<td>Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task(s) including organization, content, presentation, formatting, and stylistic choices.</td>
<td>Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing.</td>
<td>Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.</td>
</tr>
<tr>
<td>Demonstrates awareness of context, audience, purpose, and to the assigned task(s) (e.g., begins to show awareness of audience's perceptions and assumptions).</td>
<td>Uses appropriate, relevant, and compelling content to develop and explore ideas through most of the work.</td>
<td>Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices.</td>
<td>Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.</td>
<td>Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.</td>
</tr>
<tr>
<td>Demonstrates minimal attention to context, audience, purpose, and to the assigned task(s) (e.g., expectation of instructor or self as audience).</td>
<td>Uses appropriate and relevant content to develop simple ideas in some parts of the work.</td>
<td>Attempts to use a consistent system for basic organization and presentation.</td>
<td>Demonstrates an attempt to use sources to support ideas in the writing.</td>
<td>Uses language that sometimes impedes meaning because of errors in usage.</td>
</tr>
</tbody>
</table>
This rubric is designed to make clear the grading process for written communication by informing you, the writer, what key elements are expected by the university in a “good” piece of written work.

Your written work will be evaluated by the criteria below in order to give you specific feedback to help guide your development as a writer. Your writing will not be graded point by point by these items; it will be graded for its overall quality.

<table>
<thead>
<tr>
<th>Presentation</th>
<th>Excellent</th>
<th>Competent</th>
<th>Not Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The purpose and focus are clear and consistent.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. The main claim is clear, significant, and challenging.</td>
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<td></td>
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<tr>
<td>3. Organization is purposeful, effective, and appropriate.</td>
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<td></td>
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<tr>
<td>4. Sentence form and word choice are varied and appropriate.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. Punctuation, grammar, spelling, and mechanics are appropriate.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content</th>
<th>Excellent</th>
<th>Competent</th>
<th>Not Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Information and evidence are accurate, appropriate, and integrated effectively.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Claims and ideas are supported and elaborated.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Alternative perspectives are carefully considered and represented.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thinking</th>
<th>Excellent</th>
<th>Competent</th>
<th>Not Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Connections between and among ideas are made.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Analysis/synthesis/evaluation/interpretation are effective and consistent.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Independent thinking is evident.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Creativity/originality is evident.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assignment Specific Criteria</th>
<th>Excellent</th>
<th>Competent</th>
<th>Not Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Responds to all aspects of the assignment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Considers the appropriate audience/implied reader.</td>
<td></td>
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</tr>
</tbody>
</table>

**Overall Evaluation**

- [ ] Excellent
- [ ] Competent
- [ ] Not Acceptable

Grade ______

**Comments**
The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

The type of oral communication most likely to be included in a collection of student work is an oral presentation and therefore is the focus for the application of this rubric.

Definition

Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners’ attitudes, values, beliefs, or behaviors.

Framing Language

Oral communication takes many forms. This rubric is specifically designed to evaluate oral presentations of a single speaker at a time and is best applied to live or video-recorded presentations. For panel presentations or group presentations, it is recommended that each speaker be evaluated separately. This rubric best applies to presentations of sufficient length such that a central message is conveyed, supported by one or more forms of supporting materials and includes a purposeful organization. An oral answer to a single question not designed to be structured into a presentation does not readily apply to this rubric.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Central message**: The main point/thesis/»bottom line/»»take-away» of a presentation. A clear central message is easy to identify; a compelling central message is also vivid and memorable.
- **Delivery techniques**: Posture, gestures, eye contact, and use of the voice. Delivery techniques enhance the effectiveness of the presentation when the speaker stands and moves with authority, looks more often at the audience than at his/her speaking materials/notes, uses the voice expressively, and uses few vocal fillers («um,» «uh,» «like,» «you know,» etc.).
- **Language**: Vocabulary, terminology, and sentence structure. Language that supports the effectiveness of a presentation is appropriate to the topic and audience, grammatical, clear, and free from bias. Language that enhances the effectiveness of a presentation is also vivid, imaginative, and expressive.
- **Organization**: The grouping and sequencing of ideas and supporting material in a presentation. An organizational pattern that supports the effectiveness of a presentation typically includes an introduction, one or more identifiable sections in the body of the speech, and a conclusion. An organizational pattern that enhances the effectiveness of the presentation reflects a purposeful choice among possible alternatives, such as a chronological pattern, a problem-solution pattern, an analysis-of-parts pattern, etc., that makes the content of the presentation easier to follow and more likely to accomplish its purpose.
- **Supporting material**: Explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities, and other kinds of information or analysis that supports the principal ideas of the presentation. Supporting material is generally credible when it is relevant and derived from reliable and appropriate sources. Supporting material is highly credible when it is also vivid and varied across the types listed above (e.g., a mix of examples, statistics, and references to authorities). Supporting material may also serve the purpose of establishing the speakers credibility. For example, in presenting a creative work such as a dramatic reading of Shakespeare, supporting evidence may not advance the ideas of Shakespeare, but rather serve to establish the speaker as a credible Shakespearean actor.
Definition

Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners’ attitudes, values, beliefs, or behaviors.

_Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance._

Rubric on following page.
<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Organization</th>
<th>Language</th>
<th>Delivery</th>
<th>Supporting Material</th>
<th>Central Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.</td>
<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.</td>
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<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.</td>
</tr>
<tr>
<td>2</td>
<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.</td>
<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.</td>
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<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.</td>
</tr>
<tr>
<td>3</td>
<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.</td>
<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.</td>
<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.</td>
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<td>4</td>
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<td>Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.</td>
</tr>
</tbody>
</table>

**Central Message**: 
A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic. The central message is compelling (precisely stated, appropriate, memorable, and strongly supported).
Levels of Presentation
Bowling Green University, http://www.bgsu.edu/offices/provost/Assessment/Present.htm

"Presenting" requires fluency not only in English or another language, but often also in other symbol systems, such as logical, mathematical, visual, spatial, musical, electronic, or gestures and movements. Speaking quality for course presentations will be evaluated using the features defining the four levels shown below.

<table>
<thead>
<tr>
<th>Level 1 Presenting (Beginner)</th>
<th>Ill-defined or no announced purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfocused sense of audience</td>
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<tr>
<td>Inadequate organization and/or development</td>
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<tr>
<td>Inappropriate or insufficient details to support ideas</td>
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<tr>
<td>Does not demonstrate understanding of topic beyond a surface level</td>
<td></td>
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<tr>
<td>Looks only at notes or away from audience</td>
<td></td>
</tr>
<tr>
<td>Vocal qualities (pace, inflection, volume, enunciation) distract from the content</td>
<td></td>
</tr>
<tr>
<td>Lacks interest in the topic</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2 Presenting (Novice)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vague purpose or multiple purposes</td>
</tr>
<tr>
<td>Sense of audience wavers</td>
</tr>
<tr>
<td>Evident but inconsistent development</td>
</tr>
<tr>
<td>Does not advance an argument with adequate support</td>
</tr>
<tr>
<td>Demonstrates some understanding of the topic, but does make connections among ideas</td>
</tr>
<tr>
<td>Little eye contact is made with audience</td>
</tr>
<tr>
<td>Vocal qualities (pace, inflection, volume, enunciation) interfere with the content</td>
</tr>
<tr>
<td>Shows some interest for the topic</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3 Presenting (Proficient)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expresses a clear, coherent thesis</td>
</tr>
<tr>
<td>Sticks to the purpose and provides adequate transitions among ideas</td>
</tr>
<tr>
<td>Moves beyond surface understanding and demonstrates facility with topical and disciplinary knowledge and vocabulary</td>
</tr>
<tr>
<td>Advances argument with sound evidence and references</td>
</tr>
<tr>
<td>Appropriate eye contact is made with audience</td>
</tr>
<tr>
<td>Vocal qualities (pace, inflection, volume, enunciation) support the content</td>
</tr>
<tr>
<td>Shows enthusiasm for topic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 4 Presenting (Advanced)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insightful, creative or skillfully presented purpose</td>
</tr>
<tr>
<td>Awareness of audience demonstrated through form, language, and presence</td>
</tr>
<tr>
<td>Effective organization contributes to full development of presentation</td>
</tr>
<tr>
<td>Innovatively or expertly advances the presentation with well-researched evidence and documentation</td>
</tr>
<tr>
<td>Eye contact is used to gauge reactions and understanding</td>
</tr>
<tr>
<td>Vocal qualities (pace, inflection, volume, enunciation) reinforce and animate the content</td>
</tr>
<tr>
<td>Creates enthusiasm about topic in others</td>
</tr>
</tbody>
</table>
Critical Thinking VALUE Rubric

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can by shared nationally through a common dialog and understanding of student success.

Definition

Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

Framing Language

This rubric is designed to be transdisciplinary, reflecting the recognition that success in all disciplines requires habits of inquiry and analysis that share common attributes. Further, research suggests that successful critical thinkers from all disciplines increasingly need to be able to apply those habits in various and changing situations encountered in all walks of life.

This rubric is designed for use with many different types of assignments and the suggestions here are not an exhaustive list of possibilities. Critical thinking can be demonstrated in assignments that require students to complete analyses of text, data, or issues. Assignments that cut across presentation mode might be especially useful in some fields. If insight into the process components of critical thinking (e.g., how information sources were evaluated regardless of whether they were included in the product) is important, assignments focused on student reflection might be especially illuminating.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- Ambiguity: Information that may be interpreted in more than one way.
- Assumptions: Ideas, conditions, or beliefs (often implicit or unstated) that are «taken for granted or accepted as true without proof.» (quoted from www.dictionary.reference.com/browse/assumptions)
- Context: The historical, ethical, political, cultural, environmental, or circumstantial settings or conditions that influence and complicate the consideration of any issues, ideas, artifacts, and events.
- Literal meaning: Interpretation of information exactly as stated. For example, “she was green with envy” would be interpreted to mean that her skin was green.
- Metaphor: Information that is (intended to be) interpreted in a non-literal way. For example, “she was green with envy” is intended to convey an intensity of emotion, not a skin color.

Definition

Critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.
<table>
<thead>
<tr>
<th></th>
<th>Capstone 4</th>
<th>Milestones 3</th>
<th>Milestones 2</th>
<th>Benchmark 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.</strong></td>
<td>Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.</td>
<td>Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.</td>
<td>Issue/problem to be considered critically is stated without clarification or description.</td>
<td></td>
</tr>
<tr>
<td><strong>Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.</strong></td>
<td>Information is taken from source(s) with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.</td>
<td>Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.</td>
<td>Information is taken from source(s) without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question.</td>
<td></td>
</tr>
<tr>
<td><strong>Thoroughly (systematically and methodically) analyzes own and others’ assumptions and carefully evaluates the relevance of contexts when presenting a position.</strong></td>
<td>Identifies own and others’ assumptions and several relevant contexts when presenting a position.</td>
<td>Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others’ assumptions than one’s own (or vice versa).</td>
<td>Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.</td>
<td></td>
</tr>
<tr>
<td><strong>Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others’ points of view are synthesized within position (perspective, thesis/hypothesis).</strong></td>
<td>Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others’ points of view are acknowledged within position (perspective, thesis/hypothesis).</td>
<td>Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue.</td>
<td>Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious.</td>
<td></td>
</tr>
<tr>
<td><strong>Conclusions and related outcomes (consequences and implications) are logical and reflect student’s informed evaluation and ability to place evidence and perspectives discussed in priority order.</strong></td>
<td>Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.</td>
<td>Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.</td>
<td>Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.</td>
<td></td>
</tr>
</tbody>
</table>
# Holistic Critical Thinking Scoring Rubric

**Facione and Facione**

<table>
<thead>
<tr>
<th>Score</th>
<th>Consistently does all or almost all of the following:</th>
</tr>
</thead>
</table>
| 4     | Accurately interprets evidence, statements, graphics, questions, etc.  
       | Identifies the salient arguments (reasons and claims) pro and con.  
       | Thoughtfully analyzes and evaluates major alternative points of view.  
       | Draws warranted, judicious, non-fallacious conclusions.  
       | Justifies key results and procedures, explains assumptions and reasons.  
       | Fair-mindedly follows where evidence and reasons lead. |
| 3     | Does most or many of the following:  
       | Accurately interprets evidence, statements, graphics, questions, etc.  
       | Identifies relevant arguments (reasons and claims) pro and con.  
       | Offers analyses and evaluations of obvious alternative points of view.  
       | Draws warranted, non-fallacious conclusions.  
       | Justifies some results or procedures, explains reasons.  
       | Fair-mindedly follows where evidence and reasons lead. |
| 2     | Does most or many of the following:  
       | Misinterprets evidence, statements, graphics, questions, etc.  
       | Fails to identify strong, relevant counter-arguments.  
       | Ignores or superficially evaluates obvious alternative points of view.  
       | Draws unwarranted or fallacious conclusions.  
       | Justifies few results or procedures, seldom explains reasons.  
       | Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions. |
| 1     | Consistently does all or almost all of the following:  
       | Offers biased interpretations of evidence, statements, graphics, questions, information, or the points of view of others.  
       | Fails to identify or hastily dismisses strong, relevant counter-arguments.  
       | Ignores or superficially evaluates obvious alternative points of view.  
       | Argues using fallacious or irrelevant reasons, and unwarranted claims.  
       | Does not justify results or procedures, nor explain reasons.  
       | Regardless of the evidence or reasons, maintains or defends views based on self-interest or preconceptions.  
       | Exhibits close-mindedness or hostility to reason. |

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Quantitative Literacy VALUE Rubric

for more information, please contact value@aacu.org

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Definition

Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a «habit of mind,» competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

Quantitative Literacy Across the Disciplines

Current trends in general education reform demonstrate that faculty are recognizing the steadily growing importance of Quantitative Literacy (QL) in an increasingly quantitative and data-dense world. AAC&U’s recent survey showed that concerns about QL skills are shared by employers, who recognize that many of today’s students will need a wide range of high level quantitative skills to complete their work responsibilities. Virtually all of today’s students, regardless of career choice, will need basic QL skills such as the ability to draw information from charts, graphs, and geometric figures, and the ability to accurately complete straightforward estimations and calculations.

Preliminary efforts to find student work products which demonstrate QL skills proved a challenge in this rubric creation process. It’s possible to find pages of mathematical problems, but what those problem sets don’t demonstrate is whether the student was able to think about and understand the meaning of her work. It’s possible to find research papers that include quantitative information, but those papers often don’t provide evidence that allows the evaluator to see how much of the thinking was done by the original source (often carefully cited in the paper) and how much was done by the student herself, or whether conclusions drawn from analysis of the source material are even accurate.

Given widespread agreement about the importance of QL, it becomes incumbent on faculty to develop new kinds of assignments which give students substantive, contextualized experience in using such skills as analyzing quantitative information, representing quantitative information in appropriate forms, completing calculations to answer meaningful questions, making judgments based on quantitative data and communicating the results of that work for various purposes and audiences. As students gain experience with those skills, faculty must develop assignments that require students to create work products which reveal their thought processes and demonstrate the range of their QL skills.

This rubric provides for faculty a definition for QL and a rubric describing four levels of QL achievement which might be observed in work products within work samples or collections of work. Members of AAC&U’s rubric development team for QL hope that these materials will aid in the assessment of QL — but, equally important, we hope that they will help institutions and individuals in the effort to more thoroughly embed QL across the curriculum of colleges and universities.

Framing Language

This rubric has been designed for the evaluation of work that addresses quantitative literacy (QL) in a substantive way. QL is not just computation, not just the citing of someone else’s data. QL is a habit of mind, a way of thinking about the world that relies on data and on the mathematical analysis of data to make connections and draw conclusions. Teaching QL requires us to design assignments that address authentic, data-based problems. Such assignments may call for the traditional written paper, but we can imagine other alternatives: a video of a PowerPoint presentation, perhaps, or a well designed series of web pages. In any case, a successful demonstration of QL will place the mathematical work in the context of a full and robust discussion of the underlying issues addressed by the assignment.
Finally, QL skills can be applied to a wide array of problems of varying difficulty, confounding the use of this rubric. For example, the same student might demonstrate high levels of QL achievement when working on a simplistic problem and low levels of QL achievement when working on a very complex problem. Thus, to accurately assess a student’s QL achievement it may be necessary to measure QL achievement within the context of problem complexity, much as is done in diving competitions where two scores are given, one for the difficulty of the dive, and the other for the skill in accomplishing the dive. In this context, that would mean giving one score for the complexity of the problem and another score for the QL achievement in solving the problem.

**Definition**

Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a “habit of mind,” competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

_Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance._
<table>
<thead>
<tr>
<th>Interpretation</th>
<th>Capstone</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)</td>
<td>Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. For example, accurately explains the trend data shown in a graph and makes reasonable predictions regarding what the data suggest about future events.</td>
<td>Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units. For instance, accurately explains trend data shown in a graph, but may miscalculate the slope of the trend line.</td>
</tr>
<tr>
<td>Representation</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)</td>
<td>Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding</td>
<td>Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.</td>
</tr>
<tr>
<td>Calculation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Competently converts relevant information into an appropriate and desired mathematical portrayal.</td>
<td>Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.</td>
</tr>
<tr>
<td>Application / Analysis</td>
<td>Benchmark</td>
<td>1</td>
</tr>
<tr>
<td>Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis</td>
<td>Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.</td>
<td>Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.</td>
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<tr>
<td>Assumptions</td>
<td>Communication</td>
<td>Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.</td>
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<td>-------------</td>
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<td>------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Ability to make and evaluate important assumptions in estimation, modeling, and data analysis</td>
<td>Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized)</td>
<td>Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explanation may be uneven.</td>
</tr>
<tr>
<td>Communication</td>
<td>Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.</td>
<td>Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explanation may be uneven.</td>
</tr>
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Assessing the Quantitative Skills of College Juniors
Steven F. Bauman
William O. Martin

Steve Bauman received his Ph.D. in mathematics from the University of Illinois in 1962 under the direction of Michio Suzuki. He is currently a professor of mathematics at the University of Wisconsin at Madison and has taught at Princeton, Northwestern, and Spelman College. His research interests flow from the theory of groups, and for the past three years he has been involved with quantitative assessment and quantitative reasoning. He lives in the country with his wife Karen, who is a clinical psychologist, three Irish wolfhounds, and three cats.

Bill Martin enjoyed teaching geography and mathematics in an Australian high school for 11 years before returning to graduate school. He has bachelor’s degrees in geography (Northern Iowa) and mathematics (Iowa State). John Harvey directed his M.A. (Mathematics) and Ph.D. (1993, mathematics education) at the University of Wisconsin-Madison, where Bill is now the researcher for the Quantitative Assessment Project, work closely tied to his interests in the lasting impact of mathematics instruction and the use of technologies. Bill misses cricket and year-round golfing but, with his Australian wife and three children, enjoys living in the Midwest.

Two Quantitative Tasks

Suppose we gave the following problem to a group of juniors at your local college or university—what proportion of the students would you expect to give the correct answer?

Problem 1. A media professor asked the students in his class whether or not they read Time or Newsweek the previous week. The students’ responses are summarized in the table.

<table>
<thead>
<tr>
<th>Newsweek</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes 52</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>No 41</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

How many students said they read Time the previous week?

We have used this and similar problems with many students at the University of Wisconsin-Madison and were surprised to find that only about a third of the students, and rarely more than half, correctly answered this question about data in a cross-tabulation table.
Let's consider another, more mathematical, problem. Suppose this time that a group of juniors, who had studied from one to three semesters of calculus, were given problem 2. How do you think they would do?

Problem 2. Figure 1 is the graph of a function \( y = f(x) \). Use the graph to estimate these values as accurately as you can:

a. \( f(3) \)  
b. \( f'(7) \)  
c. \( f'(1) \)

d. For which values of \( x \) in the interval \([0, 9]\) is \( f'(x) \) negative?

![Figure 1](image)

The proportion of students in our study who correctly answered a group of questions about a graph, such as this, ranged from 10\% (in a course where most students had completed just one semester of calculus) to around 60\% (in a course for students who had completed the standard three-semester science and engineering calculus sequence). Again, we were very surprised that so many college juniors had difficulty with such questions.

Our research addresses the extent to which emerging college juniors have the quantitative skills required for success in their chosen upper-division courses. This article describes our quantitative assessment project, its findings, and its impact. Our assessment project may be of special interest to mathematicians and statisticians, not assessment professionals. The process has several important advantages over more familiar, standardized external assessments: (a) It is faculty driven, promoting faculty involvement and reflecting faculty needs (see [2] and [4]); (b) the assessment process and its outcomes contribute equally to instructional improvement; (c) it has a specific focus and is tied to particular courses; (d) it reflects the educational choices and needs of students; and (e) it provides useful information both for participants and for departments and campus administrators.

The two problems given above may already have raised some questions (or doubts). For instance:

- Are the reported results representative of college juniors generally? Although our approach is closely tied to specific courses, repeated assessments revealed similar patterns in a variety of settings. We are confident that our findings are at least representative of undergraduates at this university, and most likely they apply more widely.
• *Why use these problems*—what makes these quantitative skills important? All test problems are chosen by upper-division undergraduate course instructors as representing skills needed for success in their course. The items may not always reflect what mathematicians or statisticians believe is important, but they definitely reflect the expectations of faculty members in other departments.

• *Is this another discouraging report of the inadequacies of American college students?* If so, do you have specific suggestions to help faculty members deal with the problems? Yes, we have found some discouraging information about the capabilities of undergraduates, and the project has identified areas of the undergraduate curriculum that should be improved. But we believe that individual faculty members and departments will respond effectively to this appraisal of their students’ capabilities. Precisely because it is so closely tied to the courses they offer, the information we provide should be useful as they plan their responses to problem areas we uncover. A side benefit is that our assessment process encourages faculty members to reflect on and discuss with colleagues the goals of their instruction.

**Two Roles for the Math Department**

Mathematics has important roles in the undergraduate curriculum that provide the context for our assessment work. On most college and university campuses the subject is considered, to some degree or another, an essential component of the general education of every student; only English has a comparably ubiquitous role in the undergraduate curriculum. Because of this, mathematics faculty members have dual instructional roles in their involvement with introductory undergraduate mathematics. On the one hand, the first two years of the curriculum lay the groundwork for the upper-division and graduate work of those who will specialize in mathematics. Mathematicians, like scholars in other disciplines, are best qualified to decide what preparation their students need to pursue advanced study in mathematics. On the other hand, mathematics also functions as a service role, which often requires much of the department’s instructional resources. Typical of this imbalance, our department recently had about 250 declared undergraduate mathematics majors, while more than 6500 students were enrolled in courses up to introductory linear algebra. A significant problem that mathematicians face in undergraduate programs is to design instruction that fulfills both instructional roles—preparing majors and serving the quantitative needs of other departments.

This balancing act is a challenge because the roles are not necessarily compatible; trade-offs must be made. For example, should mathematics departments use specialized, parallel courses, requiring students to make an early (perhaps premature) decision about the direction of their academic career? Or should general introductory courses be used, preserving student options and, perhaps, conserving limited instructional resources—but at the expense of the level of preparation for specific disciplines?

**Our Assessment Project**

Like many institutions of higher education in this era of accountability (see [1]), those in the University of Wisconsin system were directed to implement an assessment plan targeting the quantitative and verbal capabilities of emerging juniors. The faculty committee that worked to meet this Regents’ directive on the
Madison campus decided to break from existing quantitative and verbal assessments that measure all students on a common scale (such as commercial standardized tests). Considering the tremendous range in the quantitative backgrounds of college juniors (from no collegiate mathematics to advanced undergraduate course work), the group instead sought ways to tie assessment to student backgrounds. This was accomplished by linking assessment to specific courses.

Perhaps it was not too surprising, considering prevalent methods of classroom assessment, that the group selected classroom tests to generate the required information. We developed an “itembank” of problems covering material from undergraduate mathematics courses (through introductory differential equations) and from basic statistics. Instructors, selected from a range of departments, use a questionnaire linked to the itembank to identify the specific quantitative skills their students need. The students are then given a test at the start of the semester designed to determine whether they have these skills. We discovered that the careful design of these assessment tests is crucial and have tailored our original plans for an “automated” test-generating procedure accordingly.

About 10 custom-designed free-response (i.e., not multiple choice) tests have been given to 300 or more students, mostly juniors, each semester since fall 1990. The tests, usually given during the second week of classes, assess the extent to which students possess those quantitative skills that their instructors (a) identify as essential for survival in the course, (b) expect students to have from the first day of class, and (c) will not cover during the course. For example, both problems 1 and 2 above met these criteria in several courses. Our role as assessors is to ensure that each test reflects what students in a course need to know. The tests are intended to be neither “wish lists” nor comprehensive examinations of the content of prerequisite mathematics courses.

Corrected test papers are returned to students, along with solutions and specific references for remediation, within one week. Instructors receive information about the students’ test performances a few days later. Thus, early in the semester both students and instructors possess useful information about instructor expectations, student capabilities, and the need for any corrective action. We have developed a reliable grading system that allows mathematics graduate students, with limited training, quickly to record information about the students’ work and their degree of success on each problem. The coding system provides detailed data for later analysis while allowing the quick return of corrected papers to the students.

Information of two kinds is generated by our assessment process: (a) a detailed picture of those quantitative skills needed for upper-division course work in other departments and (b) an assessment of the quantitative capabilities of new juniors outside the context of specific mathematics courses. The first comes from our personal contacts with faculty members as we design the test and interpret the results; the second is provided by analysis of students’ performance on the assessment project tests and their quantitative backgrounds as shown by university records.

**Departmental Needs and Student Capabilities Revealed by Assessment**

More than 3000 undergraduates have taken an assessment project test over the first five years of operation. Broadly, we find that instructors do expect their students to have certain skills covered in prerequisite mathematics or statistics courses and that many, even most, students have adequate skills to meet the quantitative demands of their chosen upper-division courses. While the project has
not revealed gross mismatches at this institution between instructor expectations, the content of prerequisite courses, and student capabilities, specific areas clearly require some attention. We should caution that the natural inclination to focus on shortcomings, as we did at the start of this article, may convey an exaggerated impression of student unpreparedness.

University transcripts provide supplementary information related to student performance on assessment tests. We discovered a group of students who apparently avoid any college courses with a quantitative component, judging by their transcript information as well as written student and instructor comments on tests and follow-up questionnaires. This behavior may not be inherently undesirable. But taken along with the poor performance on routine, basic statistics and arithmetic tasks needed in their chosen, nonquantitative courses, this finding raises two important questions: Is there a base level of quantitative literacy that should be required of all baccalaureate students? If so, how should these requirements be set and met? A university curriculum committee pursued these questions, ultimately recommending a university-wide quantitative degree requirement. This is probably the clearest example of our assessment work’s broad curricular impact.

Three levels of quantitative expectations. There seem to be three levels of quantitative expectations for students in upper-division undergraduate courses. Level 1 courses, such as Principles of Advertising and Construction of Classroom Tests, lack any formal quantitative prerequisites. Their instructors expect basic statistical and arithmetic skills along with the ability to read and interpret information presented in tables and graphs. Sometimes Level 1 courses also draw on basic geometric and algebraic capabilities. All these quantitative skills are found in high school curricula. Whether students have these skills is of concern to mathematicians, but they have no place in the college mathematics curriculum.

Student capabilities in courses at the other two quantitative levels depend much more on introductory college mathematics and statistics courses. Level 2 courses, such as Finance and Quantitative Methods in Agricultural Economics, require a semester of calculus and perhaps a first course in statistics. Level 3 courses usually require three semesters of calculus. Examples of Level 3 courses that we have assessed include Biophysical Chemistry, Circuit Analysis, Techniques in Ordinary Differential Equations, and Mechanics.

Patterns of student performance on quantitative tasks. Our results in several Level 1 courses revealed gaps in the curricula of the mathematics and statistics departments. That is, students who had difficulties with problems on the assessment tests could not be directed to existing courses that cover the material. For example, an early and surprising discovery was that so many students could not solve problem 1 above. This skill from basic statistics is important for understanding experimental results reported in a journal article. Students in Level 1 courses are usually successful with direct computations (e.g., converting temperatures from Fahrenheit to Celsius using a provided formula) and one-step problems (e.g., using the table in problem 1 to say how many students did not read either magazine). Many students at this level run into difficulty when asked to relate information logically, as in problem 1, or to extract information and devise a strategy to use it. Problem 3 is another example of such a task, involving percentages.

Problem 3. An advertising company is planning the layout for a full-page ad in a magazine with $8'' \times 10\frac{1}{2}''$ pages. The cost of the ad depends partly on the amount of
printed space (excluding margins), so they want to compare the printed area if they
use no margins to the printed area using 1" margins. What percentage of the full
page will be printed if they use one-inch margins all around as shown in Figure 2?

![Figure 2]

In one Level 1 course, 20% of the students answered this question correctly; in
another about one-third got it. The difficulty is less in computing percentages than
in deciding what to do with the information that is provided. When the same
classes were told "170 is 85% of a number—find the number," three-quarters of
the students gave the correct answer.

Most students in Level 2 courses are successful with tasks from statistics and
precalculus; few show proficiency with material from calculus. Conceptual tasks,
such as deducing information about a function's derivatives based on a graph of
the function (problem 2), are not handled well. In most Level 2 courses many
students can handle routine tasks, such as finding a derivative, but have little
success with other material from calculus.

Students in Level 3 courses also have difficulty with similar, less routine, more
conceptual problems. At this level, a common question involves the evaluation of a
definite integral. In one Level 3 course many more students could exactly evaluate
a definite trigonometric integral symbolically than could accurately estimate its
value from a graph. In other courses many students were unable to make
numerical or graphical approximations of integrals. To our surprise, only a quarter
of the students in a first differential equations course correctly evaluated a
convergent geometric series. Generally, Level 3 students are prepared for the
quantitative requirements of their chosen courses. Although students may have
difficulties with specific problems, instructors from these technical courses report
that students usually regain the necessary skills during the semester.

**General Conclusions**

It seems that instructors often want students to be able to reason independently, to
make interpretations, and to draw on basic quantitative concepts in their courses;
they are less concerned about whether students remember particular algorithms or
procedures. These conceptual expectations were confirmed during our meetings
with groups of faculty members from other departments. In contrast, students are
most successful with routine, standard computational tasks and often show less
ability to use conceptual knowledge or insight to solve less standard quantitative problems. Put another way, in the context of our exams many students can do what they have been shown, successfully handling certain kinds of conventional problems (e.g., using substitution or integration by parts); few students seem able to make connections or to solve more novel problems (e.g., estimating an integral’s value from a graph or tabular data).

Assessment has always had a prominent role in the study of mathematics in colleges and universities. With the exception of graduate qualifying examinations, most of this attention has been at the level of individual courses, with assessment used to monitor student learning during and at the end of a particular course. The natural focus of mathematics faculty members is on their majors and graduate students. We have outlined a locally developed procedure that addresses another important but often neglected dimension of assessment in mathematics: student retention of mathematical knowledge over the longer term and in relation to the quantitative needs or expectations of other departments. A recent article on the nature of research in collegiate mathematics education [3] listed long-term retention of mathematical knowledge as an important issue deserving study. Although this sort of assessment has received little attention in the past, it deserves more prominence because it focuses on the important service role played by most mathematics departments. Quantitative assessment also answers the call for more assessment at the broader institutional level [1], [2], [4]. We believe that our approach helps departments and faculty members address this important aspect of their educational mission.

Note: We invite interested readers to request a copy of a fuller report that includes further details of our assessment procedure and discusses its impact on participating faculty and students, on the mathematics department and client departments, and on the university curriculum. Write to the authors at the Department of Mathematics, University of Wisconsin-Madison, 480 Lincoln Drive, Madison, WI 53706-1388.

References

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can by shared nationally through a common dialog and understanding of student success.

**Definition**

The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand. - Adopted from the National Forum on Information Literacy

**Framing Language**

This rubric is recommended for use evaluating a collection of work, rather than a single work sample in order to fully gauge students’ information skills. Ideally, a collection of work would contain a wide variety of different types of work and might include: research papers, editorials, speeches, grant proposals, marketing or business plans, PowerPoint presentations, posters, literature reviews, position papers, and argument critiques to name a few. In addition, a description of the assignments with the instructions that initiated the student work would be vital in providing the complete context for the work. Although a student’s final work must stand on its own, evidence of a student’s research and information gathering processes, such as a research journal/diary, could provide further demonstration of a student’s information proficiency and for some criteria on this rubric would be required.

**Definition**

The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand. - The National Forum on Information Literacy

_Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance._
<table>
<thead>
<tr>
<th>Determin the Extent of Information Needed</th>
<th>Benchmak 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectively defines the scope of the research question or thesis. Effectively determines key concepts. Types of information (sources) selected directly relate to concepts or answer research question.</td>
<td>Has difficulty defining the scope of the research question or thesis. Has difficulty determining key concepts. Types of information (sources) selected do not relate to concepts or answer research question.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access the Needed Information</th>
<th>Benchmark 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accesses information using effective, well-designed search strategies and most appropriate information sources.</td>
<td>Accesses information randomly, retrieves information that lacks relevance and quality.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluate Information and its Sources Critically</th>
<th>Benchmark 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.</td>
<td>Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Use Information Effectively to Accomplish a Specific Purpose</th>
<th>Benchmark 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communicates, organizes and synthesizes information from sources to fully achieve a specific purpose, with clarity and depth</td>
<td>Communicates information from sources. The information is fragmented and/or used inappropriately (misquoted, taken out of context, or incorrectly paraphrased, etc.), so the intended purpose is not achieved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Access and Use Information Ethically and Legally</th>
<th>Benchmark 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students use correctly all of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrate a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.</td>
<td>Students use correctly one of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrates a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.</td>
</tr>
</tbody>
</table>
Information Literacy Defined

Information literacy is a set of abilities requiring individuals to “recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” Information literacy also is increasingly important in the contemporary environment of rapid technological change and proliferating information resources. Because of the escalating complexity of this environment, individuals are faced with diverse, abundant information choices—in their academic studies, in the workplace, and in their personal lives. Information is available through libraries, community resources, special interest organizations, media, and the Internet—and increasingly, information comes to individuals in unfiltered formats, raising questions about its authenticity, validity, and reliability. In addition, information is available through multiple media, including graphical, aural, and textual, and these pose new challenges for individuals in evaluating and understanding it. The uncertain quality and expanding quantity of information pose large challenges for society. The sheer abundance of information will not in itself create a more informed citizenry without a complementary cluster of abilities necessary to use information effectively.

Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:

- Determine the extent of information needed
- Access the needed information effectively and efficiently
Information Literacy and Information Technology

Information literacy is related to information technology skills, but has broader implications for the individual, the educational system, and for society. Information technology skills enable an individual to use computers, software applications, databases, and other technologies to achieve a wide variety of academic, work-related, and personal goals. Information literate individuals necessarily develop some technology skills.

Information literacy, while showing significant overlap with information technology skills, is a distinct and broader area of competence. Increasingly, information technology skills are interwoven with, and support, information literacy. A 1999 report from the National Research Council promotes the concept of “fluency” with information technology and delineates several distinctions useful in understanding relationships among information literacy, computer literacy, and broader technological competence. The report notes that “computer literacy” is concerned with rote learning of specific hardware and software applications, while “fluency with technology” focuses on understanding the underlying concepts of technology and applying problem-solving and critical thinking to using technology. The report also discusses differences between information technology fluency and information literacy as it is understood in K-12 and higher education. Among these are information literacy’s focus on content, communication, analysis, information searching, and evaluation; whereas information technology “fluency” focuses on a deep understanding of technology and graduated, increasingly skilled use of it.²

“Fluency” with information technology may require more intellectual abilities than the rote learning of software and hardware associated with “computer literacy”, but the focus is still on the technology itself. Information literacy, on the other hand, is an intellectual framework for understanding, finding, evaluating, and using information—activities which may be accomplished in part by fluency with information technology, in part by sound investigative methods, but most important, through critical discernment and reasoning. Information literacy initiates, sustains, and extends lifelong learning through abilities which may use technologies but are ultimately independent of them.
Developing lifelong learners is central to the mission of higher education institutions. By ensuring that individuals have the intellectual abilities of reasoning and critical thinking, and by helping them construct a framework for learning how to learn, colleges and universities provide the foundation for continued growth throughout their careers, as well as in their roles as informed citizens and members of communities. Information literacy is a key component of, and contributor to, lifelong learning. Information literacy competency extends learning beyond formal classroom settings and provides practice with self-directed investigations as individuals move into internships, first professional positions, and increasing responsibilities in all arenas of life. Because information literacy augments students’ competency with evaluating, managing, and using information, it is now considered by several regional and discipline-based accreditation associations as a key outcome for college students.

For students not on traditional campuses, information resources are often available through networks and other channels, and distributed learning technologies permit teaching and learning to occur when the teacher and the student are not in the same place at the same time. The challenge for those promoting information literacy in distance education courses is to develop a comparable range of experiences in learning about information resources as are offered on traditional campuses. Information literacy competencies for distance learning students should be comparable to those for “on campus” students.

Incorporating information literacy across curricula, in all programs and services, and throughout the administrative life of the university, requires the collaborative efforts of faculty, librarians, and administrators. Through lectures and by leading discussions, faculty establish the context for learning. Faculty also inspire students to explore the unknown, offer guidance on how best to fulfill information needs, and monitor students’ progress. Academic librarians coordinate the evaluation and selection of intellectual resources for programs and services; organize, and maintain collections and many points of access to information; and provide instruction to students and faculty who seek information. Administrators create opportunities for collaboration and staff development among faculty, librarians, and other professionals who initiate information literacy programs, lead in planning and budgeting for those programs, and provide ongoing resources to sustain them.

The Boyer Commission Report, Reinventing Undergraduate Education, recommends strategies that require the student to engage actively in “framing of a significant question or set of questions, the research or creative exploration to find answers, and the communications skills to convey
Courses structured in such a way create student-centered learning environments where inquiry is the norm, problem solving becomes the focus, and thinking critically is part of the process. Such learning environments require information literacy competencies.

Gaining skills in information literacy multiplies the opportunities for students’ self-directed learning, as they become engaged in using a wide variety of information sources to expand their knowledge, ask informed questions, and sharpen their critical thinking for still further self-directed learning. Achieving competency in information literacy requires an understanding that this cluster of abilities is not extraneous to the curriculum but is woven into the curriculum’s content, structure, and sequence. This curricular integration also affords many possibilities for furthering the influence and impact of such student-centered teaching methods as problem-based learning, evidence-based learning, and inquiry learning. Guided by faculty and others in problem-based approaches, students reason about course content at a deeper level than is possible through the exclusive use of lectures and textbooks. To take fullest advantage of problem-based learning, students must often use thinking skills requiring them to become skilled users of information sources in many locations and formats, thereby increasing their responsibility for their own learning.

To obtain the information they seek for their investigations, individuals have many options. One is to utilize an information retrieval system, such as may be found in a library or in databases accessible by computer from any location. Another option is to select an appropriate investigative method for observing phenomena directly. For example, physicians, archaeologists, and astronomers frequently depend upon physical examination to detect the presence of particular phenomena. In addition, mathematicians, chemists, and physicists often utilize technologies such as statistical software or simulators to create artificial conditions in which to observe and analyze the interaction of phenomena. As students progress through their undergraduate years and graduate programs, they need to have repeated opportunities for seeking, evaluating, and managing information gathered from multiple sources and discipline-specific research methods.

Use of the Standards

*Information Literacy Competency Standards for Higher Education* provides a framework for assessing the information literate individual. It also extends the work of the American Association of School Librarians Task Force on Information Literacy Standards, thereby providing higher education an opportunity to articulate its information literacy competencies with those of K-12 so that a continuum of expectations develops for students at all levels. The competencies presented here outline the process by which faculty, librarians and others pinpoint specific indicators that identify a student as information literate.
Students also will find the competencies useful, because they provide students with a framework for gaining control over how they interact with information in their environment. It will help to sensitize them to the need to develop a metacognitive approach to learning, making them conscious of the explicit actions required for gathering, analyzing, and using information. All students are expected to demonstrate all of the competencies described in this document, but not everyone will demonstrate them to the same level of proficiency or at the same speed.

Furthermore, some disciplines may place greater emphasis on the mastery of competencies at certain points in the process, and therefore certain competencies would receive greater weight than others in any rubric for measurement. Many of the competencies are likely to be performed recursively, in that the reflective and evaluative aspects included within each standard will require the student to return to an earlier point in the process, revise the information-seeking approach, and repeat the same steps.

To implement the standards fully, an institution should first review its mission and educational goals to determine how information literacy would improve learning and enhance the institution’s effectiveness. To facilitate acceptance of the concept, faculty and staff development is also crucial.

Information Literacy and Assessment

In the following competencies, there are five standards and twenty-two performance indicators. The standards focus upon the needs of students in higher education at all levels. The standards also list a range of outcomes for assessing student progress toward information literacy. These outcomes serve as guidelines for faculty, librarians, and others in developing local methods for measuring student learning in the context of an institution’s unique mission. In addition to assessing all students’ basic information literacy skills, faculty and librarians should also work together to develop assessment instruments and strategies in the context of particular disciplines, as information literacy manifests itself in the specific understanding of the knowledge creation, scholarly activity, and publication processes found in those disciplines.

In implementing these standards, institutions need to recognize that different levels of thinking skills are associated with various learning outcomes—and therefore different instruments or methods are essential to assess those outcomes. For example, both “higher order” and “lower order” thinking skills, based on Bloom’s Taxonomy of Educational Objectives, are evident throughout the outcomes detailed in this document. It is strongly suggested that assessment methods appropriate to the thinking skills associated with each outcome be identified as an integral part of the institution’s implementation plan.
For example, the following outcomes illustrate “higher order” and “lower order” thinking skills:

“Lower Order” thinking skill: 
Outcome 2.2.a. Identifies keywords, synonyms, and related terms for the information needed.

“Higher Order” thinking skill: 
Outcome 3.3.b. Extends initial synthesis, when possible, to a higher level of abstraction to construct new hypotheses that may required additional information.

Faculty, librarians, and others will find that discussing assessment methods collaboratively is a very productive exercise in planning a systematic, comprehensive information literacy program. This assessment program should reach all students, pinpoint areas for further program development, and consolidate learning goals already achieved. It also should make explicit to the institution’s constituencies how information literacy contributes to producing educated students and citizens.

Notes


3. Several key accrediting agencies concerned with information literacy are: The Middle States Commission on Higher Education (MSCHE), the Western Association of Schools and College (WASC), and the Southern Association of Colleges and Schools (SACS).

Standards, Performance Indicators, and Outcomes

Standard One

The information literate student determines the nature and extent of the information needed.

Performance Indicators:
1. The information literate student defines and articulates the need for information.

Outcomes Include:
   a. Confers with instructors and participates in class discussions, peer workgroups, and electronic discussions to identify a research topic, or other information need
   b. Develops a thesis statement and formulates questions based on the information need
   c. Explores general information sources to increase familiarity with the topic
   d. Defines or modifies the information need to achieve a manageable focus
   e. Identifies key concepts and terms that describe the information need
   f. Recognizes that existing information can be combined with original thought, experimentation, and/or analysis to produce new information

2. The information literate student identifies a variety of types and formats of potential sources for information.

Outcomes Include:
   a. Knows how information is formally and informally produced, organized, and disseminated
   b. Recognizes that knowledge can be organized into disciplines that influence the way information is accessed
   c. Identifies the value and differences of potential resources in a variety of formats (e.g., multimedia, database, website, data set, audio/visual, book)
   d. Identifies the purpose and audience of potential resources (e.g., popular vs. scholarly, current vs. historical)
   e. Differentiates between primary and secondary sources, recognizing how their use and importance vary with each discipline
   f. Realizes that information may need to be constructed with raw data from primary sources

3. The information literate student considers the costs and benefits of acquiring the needed information.
Outcomes Include:
   a. Determines the availability of needed information and makes decisions on broadening the information seeking process beyond local resources (e.g., interlibrary loan; using resources at other locations; obtaining images, videos, text, or sound)
   b. Considers the feasibility of acquiring a new language or skill (e.g., foreign or discipline-based) in order to gather needed information and to understand its context
   c. Defines a realistic overall plan and timeline to acquire the needed information

4. The information literate student reevaluates the nature and extent of the information need.

Outcomes Include:
   a. Reviews the initial information need to clarify, revise, or refine the question
   b. Describes criteria used to make information decisions and choices

Standard Two

The information literate student accesses needed information effectively and efficiently.

Performance Indicators:
1. The information literate student selects the most appropriate investigative methods or information retrieval systems for accessing the needed information.

Outcomes Include:
   a. Identifies appropriate investigative methods (e.g., laboratory experiment, simulation, fieldwork)
   b. Investigates benefits and applicability of various investigative methods
   c. Investigates the scope, content, and organization of information retrieval systems
   d. Selects efficient and effective approaches for accessing the information needed from the investigative method or information retrieval system

2. The information literate student constructs and implements effectively-designed search strategies.

Outcomes Include:
   a. Develops a research plan appropriate to the investigative method
   b. Identifies keywords, synonyms and related terms for the information needed
   c. Selects controlled vocabulary specific to the discipline or information retrieval source
d. Constructs a search strategy using appropriate commands for the information retrieval system selected (e.g., Boolean operators, truncation, and proximity for search engines; internal organizers such as indexes for books)
e. Implements the search strategy in various information retrieval systems using different user interfaces and search engines, with different command languages, protocols, and search parameters
f. Implements the search using investigative protocols appropriate to the discipline

3. The information literate student retrieves information online or in person using a variety of methods.

Outcomes Include:
   a. Uses various search systems to retrieve information in a variety of formats
   b. Uses various classification schemes and other systems (e.g., call number systems or indexes) to locate information resources within the library or to identify specific sites for physical exploration
   c. Uses specialized online or in person services available at the institution to retrieve information needed (e.g., interlibrary loan/document delivery, professional associations, institutional research offices, community resources, experts and practitioners)
   d. Uses surveys, letters, interviews, and other forms of inquiry to retrieve primary information

4. The information literate student refines the search strategy if necessary.

Outcomes Include:
   a. Assesses the quantity, quality, and relevance of the search results to determine whether alternative information retrieval systems or investigative methods should be utilized
   b. Identifies gaps in the information retrieved and determines if the search strategy should be revised
   c. Repeats the search using the revised strategy as necessary

5. The information literate student extracts, records, and manages the information and its sources.

Outcomes Include:
   a. Selects among various technologies the most appropriate one for the task of extracting the needed information (e.g., copy/paste software functions, photocopier, scanner, audio/visual equipment, or exploratory instruments)
   b. Creates a system for organizing the information
   c. Differentiates between the types of sources cited and understands the elements and correct syntax of a citation for a wide range of resources
d. Records all pertinent citation information for future reference  
e. Uses various technologies to manage the information selected and organized

**Standard Three**

The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

**Performance Indicators:**
1. The information literate student summarizes the main ideas to be extracted from the information gathered.

**Outcomes Include:**
   a. Reads the text and selects main ideas  
   b. Restates textual concepts in his/her own words and selects data accurately  
   c. Identifies verbatim material that can be then appropriately quoted

2. The information literate student articulates and applies initial criteria for evaluating both the information and its sources.

**Outcomes Include:**
   a. Examines and compares information from various sources in order to evaluate reliability, validity, accuracy, authority, timeliness, and point of view or bias  
   b. Analyzes the structure and logic of supporting arguments or methods  
   c. Recognizes prejudice, deception, or manipulation  
   d. Recognizes the cultural, physical, or other context within which the information was created and understands the impact of context on interpreting the information

3. The information literate student synthesizes main ideas to construct new concepts.

**Outcomes Include:**
   a. Recognizes interrelationships among concepts and combines them into potentially useful primary statements with supporting evidence  
   b. Extends initial synthesis, when possible, at a higher level of abstraction to construct new hypotheses that may require additional information  
   c. Utilizes computer and other technologies (e.g. spreadsheets, databases, multimedia, and audio or visual equipment) for studying the interaction of ideas and other phenomena
4. The information literate student compares new knowledge with prior knowledge to determine the value added, contradictions, or other unique characteristics of the information.

Outcomes Include:
   a. Determines whether information satisfies the research or other information need
   b. Uses consciously selected criteria to determine whether the information contradicts or verifies information used from other sources
   c. Draws conclusions based upon information gathered
   d. Tests theories with discipline-appropriate techniques (e.g., simulators, experiments)
   e. Determines probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions
   f. Integrates new information with previous information or knowledge
   g. Selects information that provides evidence for the topic

5. The information literate student determines whether the new knowledge has an impact on the individual’s value system and takes steps to reconcile differences.

Outcomes Include:
   a. Investigates differing viewpoints encountered in the literature
   b. Determines whether to incorporate or reject viewpoints encountered

6. The information literate student validates understanding and interpretation of the information through discourse with other individuals, subject-area experts, and/or practitioners.

Outcomes Include:
   a. Participates in classroom and other discussions
   b. Participates in class-sponsored electronic communication forums designed to encourage discourse on the topic (e.g., e-mail, bulletin boards, chat rooms)
   c. Seeks expert opinion through a variety of mechanisms (e.g., interviews, e-mail, listservs)

7. The information literate student determines whether the initial query should be revised.

Outcomes Include:
   a. Determines if original information need has been satisfied or if additional information is needed
   b. Reviews search strategy and incorporates additional concepts as necessary
c. Reviews information retrieval sources used and expands to include others as needed

**Standard Four**

The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

**Performance Indicators:**

1. The information literate student applies new and prior information to the planning and creation of a particular product or performance.

**Outcomes Include:**

a. Organizes the content in a manner that supports the purposes and format of the product or performance (e.g. outlines, drafts, storyboards)

b. Articulates knowledge and skills transferred from prior experiences to planning and creating the product or performance

c. Integrates the new and prior information, including quotations and paraphrasings, in a manner that supports the purposes of the product or performance

d. Manipulates digital text, images, and data, as needed, transferring them from their original locations and formats to a new context

2. The information literate student revises the development process for the product or performance.

**Outcomes Include:**

a. Maintains a journal or log of activities related to the information seeking, evaluating, and communicating process

b. Reflects on past successes, failures, and alternative strategies

3. The information literate student communicates the product or performance effectively to others.

**Outcomes Include:**

a. Chooses a communication medium and format that best supports the purposes of the product or performance and the intended audience

b. Uses a range of information technology applications in creating the product or performance

c. Incorporates principles of design and communication

d. Communicates clearly and with a style that supports the purposes of the intended audience
Standard Five

The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

Performance Indicators:
1. The information literate student understands many of the ethical, legal and socio-economic issues surrounding information and information technology.

Outcomes Include:
   a. Identifies and discusses issues related to privacy and security in both the print and electronic environments
   b. Identifies and discusses issues related to free vs. fee-based access to information
   c. Identifies and discusses issues related to censorship and freedom of speech
   d. Demonstrates an understanding of intellectual property, copyright, and fair use of copyrighted material

2. The information literate student follows laws, regulations, institutional policies, and etiquette related to the access and use of information resources.

Outcomes Include:
   a. Participates in electronic discussions following accepted practices (e.g. “Netiquette”)
   b. Uses approved passwords and other forms of ID for access to information resources
   c. Complies with institutional policies on access to information resources
   d. Preserves the integrity of information resources, equipment, systems and facilities
   e. Legally obtains, stores, and disseminates text, data, images, or sounds
   f. Demonstrates an understanding of what constitutes plagiarism and does not represent work attributable to others as his/her own
   g. Demonstrates an understanding of institutional policies related to human subjects research

3. The information literate student acknowledges the use of information sources in communicating the product or performance.

Outcomes Include:
   a. Selects an appropriate documentation style and uses it consistently to cite sources
   b. Posts permission granted notices, as needed, for copyrighted material
Direct Assessment Methods --
A Close-up Look
by
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Portfolios: collections of student work (and sometimes other material such as transcripts, test scores, or performance reviews) intended to illustrate achievement of learning outcomes. A portfolio does not serve assessment unless the student work is rated and analyzed using a rubric or other scoring tool. The portfolio mantra is “collect, select, reflect, connect,” and generally it is students who are asked to perform each of these activities. However, they can also be carried out by faculty or others in the course of creating a program- or institution-level portfolio.

Advantages:
- Are adaptable to different:
  - Levels of assessment (i.e. individual student, program, institution)
  - Purposes (i.e. cross-sectional snapshot; change/progress over time)
  - Kinds of materials (i.e. written work, tapes of performances, student self-assessments)
- Can tell us where student are and how they got there
- Emphasize human judgment, meaning-making
- Provide information likely to be used
- Have become popular, esp. as an alternative to standardized tests
- Engage students, faculty
- Are educational for both students and faculty
- Reduce fears of misuse
- Can be managed by students – to some extent
- Are supported by many different software programs

Disadvantages:
- Can be labor-intensive, cumbersome to store, navigate through
- Can seem impractical for a large institution or program
- Must relate contents to articulated outcomes
- Require carefully defined criteria for review, e.g. rubrics
- Require training for reviewers
- Require clear distinction between usefulness of the portfolio for students (e.g., to showcase work, impress prospective employers, inform advisors) and for assessment of learning
Solutions/responses:
- Collect samples of work, not everything from everybody
- Use electronic storage and retrieval
- Give students responsibility, training, for maintenance of the portfolio
- Invest in SLOs, rubrics, faculty development for the long term

Capstones: a wide variety of culminating projects, assignments, performances, or even experiences, e.g., faculty-supervised community service, internships, that provide an opportunity for students to demonstrate complex, higher-order learning at the end of a degree program.

Advantages:
- Are cumulative
- Are integrative
- Are adaptable to demonstration of
  - Skills
  - General education
  - Cognitive learning in professional field or major
  - Dispositions
  - Institutional outcomes
- Are more authentic or “real world” than many classroom assignments, and thus more motivating for many students
- Set standards for degree completion, graduation, workforce readiness
- Provide an occasion for department-level discussion, interpretation
- Invite external evaluation
- Help students make the transition to
  - Self-assessment
  - Professional assessment
  - Life-long learning

Disadvantages:
- Pose challenge of capturing all students in their final year/semester
- Differences within/among majors demand flexibility plus commonality
- May mean an additional course requirement
- Require coordinating multiple dimensions of learning & assessment
- Can be labor-intensive
- Must relate to carefully articulated outcomes
- Require carefully defined criteria for review, e.g. rubrics
- Require collaboration among program faculty, possibly also external reviewers
- Require distinguishing between purpose of the capstone for students and for program assessment

Solutions/responses:
- Require the capstone for graduation
- Introduce and coordinate as widely as possible across the institution
- Include capstone experiences within existing courses
- Present required resources, labor, as essential investment
Performances: activities, live or recorded, designed to demonstrate specific outcomes, e.g. a poster presentation, conduct of a class, a musical or theatrical performance, client counseling, facilitation of a group discussion, “think aloud” analysis of a text.

Advantages:
- Have face validity in terms of preparation for student’s real-life goals
- Put emphasis on what the student can do (as opposed to knowing about):
  - Require application
  - May require spontaneous adaptation, problem-solving
  - Are integrative
  - Provide a reality check
- Give students with practical intelligence, skills, a chance to shine
- Can elicit affective outcomes, e.g. poise, grace under pressure
- Are motivating, encourage practice, rehearsing
- Put the emphasis on active learning
- Promote coaching relationship between students and faculty, especially when there are external reviewers
- Promote self-assessment, internalization of standards
- Are highly adaptable, even to liberal arts

Disadvantages:
- Can be labor-intensive, time-consuming, expensive
- May seem impractical in large programs
- May seem irrelevant to some programs
- Must relate to articulated outcomes
- Require careful definition of criteria, e.g. rubrics
- Require careful training of reviewers, including external reviewers
- Require coordination, scheduling, esp. of external reviewers
- May frighten off insecure students

Solutions/responses:
- Review a sample of students
- Embed in routine, non-threatening situations (e.g., internship, clinical setting)
- Use technology to make performances accessible to reviewers
- Regard outcomes, criteria, and training as an essential investment
- Remind students they must demonstrate employability

Common (or signature) assignments, template assignments, secondary readings, and other embedded assessments: student work produced in response to a course assignment is examined for multiple purposes, e.g., to determine command of course material (and thus a grade) but also to assess writing skill, information literacy, critical thinking, etc.
- “Common assignment”: the same assignment across multiple courses;
- “template assignment”: the same format, but content of assignment is adapted to work across multiple courses and disciplines
- “Secondary readings”: student work is examined “secondarily” for other learning outcomes beyond command of course material.
- Common or embedded question: tests in different courses, or in different sections of the same course, may differ but still include a common question that all students are expected to answer; answers are then rated, analyzed.
Advantages:
- Use work produced by students as a normal part of their course work
- Solve the problem of quality of student effort
- Are efficient, low-cost, minimally intrusive
- Have face validity
- Provide maximally useful information for improvement with minimum slippage
- Encourage discussion, collaboration among faculty & support staff
- Can address institution-level outcomes, create campus-wide interest

Disadvantages:
- Require considerable coordination
- Can be time-consuming to create, implement
- Can be time-consuming, labor-intensive to score
- Must be designed in relation to specific outcomes
- Require careful definition of criteria for review, e.g., rubrics
- Require careful training of reviewers

Solutions/responses:
- Focus on what’s important
- Use “common questions” if an entire common assignment is impractical
- Regard outcomes, criteria, and training as an essential educational investment
- Provide support, “teaching circles’ to discuss implementation, findings
- Emphasize the efficiencies, benefits

Learning management programs: software that allows faculty to set up wikis, chat rooms, threaded discussions, etc., and then capture student responses for later analysis.

Advantages:
- Are adaptable to wide range of learning outcomes, disciplines, environments
- Use work produced by students as a normal part of course participation
- Record discussions, chat, ephemera that are impossible or cumbersome to capture face to face
- Give quiet students an opportunity to shine
- Can preserve a large volume of material, allow sorting, retrieval, data analysis
- Are efficient, low-cost
- Are unintrusive
- Solve the problem of quality of student effort
- Allow prompt feedback
- Develop students’ metacognition when assessment results are shared
- Often include tests, quizzes, tasks as part of package, thus supporting a multiple-method approach

Disadvantages:
- Rely heavily on student writing skill, comfort with technology
- Pose challenges to higher levels of aggregation beyond individual course or student
- May discourage collaboration among faculty, staff, programs
- Managing large volume of material can be challenging
- “No significant difference” bias may short circuit improvement
- Tests, quizzes may promote recall, surface rather than deep learning
- Built-in survey tools encourage collection of indirect rather than direct evidence
• Direct observation of student performances is difficult or impossible
• Software may drive the assessment effort, instead of assessment goals and values driving choice, use of the software

Solutions/responses:
• Develop good, focused outcomes, criteria, rubrics
• Use built-in data management tools
• Supplement if necessary, e.g. with “The Rubric Processor”
• Invest in training of faculty, external reviewers
• Use tests, quizzes with caution, supplement with authentic tasks
• Negotiate with the maker to customize the software
• Aim for program-level, not just individual or course-level improvement

Classroom Assessment/Research: an approach to assessment pioneered in the 1980s and ‘90s by K. Patricia Cross and Thomas A. Angelo; provides a large collection of techniques individual instructors can use in their classrooms to discover what students are learning – or not – and to make rapid adjustments.

Advantages:
• Takes place at ground zero of learning process for:
  ▪ Maximum relevance, usefulness
  ▪ Minimum slippage
• Offers maximum privacy, minimum risk, anxiety
• Is conducted continuously, has formative benefit
• Can provide feedback on both
  ▪ What students know and can do
  ▪ And how they got there, what helps or hinders
• Motivates students to become more active, reflective learners
• Can also be used by faculty collectively for the bigger picture
• Is faculty-friendly, respectful of privacy, autonomy
• Offers significant resources (e.g., T. Angelo and K. P. Cross, Classroom Assessment Techniques, 1992) and support networks, especially for community college educators

Disadvantages:
• Is unstructured, highly dependent on individuals’ cooperation for
  ▪ Administration of CATs (classroom assessment techniques)
  ▪ Reporting of results
• Presents challenge of generalizing to program or institution level
• Focus on individual instructor, classroom privacy has become somewhat dated

Solutions/responses:
• Provide consistent, careful leadership, oversight
• Get buy-in from faculty, others
• Start with agreement on shared learning outcomes, goals
• Provide training
• Emphasize important of program-level and campus-wide assessment
• Select techniques with potential for useful information
**Student self-assessment:** student demonstration of the ability to accurately self-assess a piece of work or performance, usually in relation to one or more outcomes and a set of criteria, e.g. rubrics. May also be thought of as a form of “performance.”

**Advantages:**
- The ultimate in active learning, engagement, ownership of one’s learning
- Highly adaptable
- Extremely educational for students
- Promotes internalization of intellectual, personal, professional standards
- Is an essential component of ongoing professional, personal development
- Is an essential component of life-long learning
- Individual results can be aggregated to identify general findings, trends

**Disadvantages:**
- Challenging, especially at outset, for both students and faculty
- Requires clear outcomes, criteria (e.g., rubrics), expectations for level of proficiency
- Requires students to assess with candor, not spin
- May cause student anxiety, avoidance
- Long-standing habits, personality traits may need to be overcome (e.g., self-consciousness, excessive modesty, unrealistically high self-appraisal)
- Requires tact and true coaching attitude from instructor, ability to critique the work or performance, not the person
- Requires careful management of others who may be present

**Solutions/responses:**
- Experienced instructors guide, mentor novice instructors
- Students receive orientation, training
- Outcomes, criteria, expectations are clear, widely distributed and understood
- Examples of self-assessment are available to supplement rubrics
- Process is presented as primarily developmental, formative
- Examples of progress over extended time provide encouragement
- Self-assessment is risk-free

**Local tests:** tests designed in relation to the specific course, program, or institution’s curriculum and learning outcomes, as opposed to generic, commercially available standardized tests. Can be cumulative (e.g. comprehensives in the major) or less encompassing but still cross-cutting. Format may vary; need not be multiple choice, as in most commercial tests.

**Advantages:**
- Tests are traditional, widely accepted academic practice
- Tests are motivating for students
- Testing across courses or programs requires active faculty participation, can stimulate discussion about alignment of outcomes, curriculum, pedagogy, etc.
- Can be designed to have content validity
- Can adapt readily to institutional changes in curriculum, outcomes
- Can be open-ended, integrative, highly creative in format
- Can provide good quality of student effort if course-embedded
- Provide directly relevant, *useful* information to instructors
- Forestall comparison with other institutions
Disadvantages:

- Run risk of focusing more on surface than deep learning
- Provide no norms for reference, benchmarking
- May contain ambiguous, poorly constructed items
- May offer questionable reliability and validity
- May be expensive if test construction is contracted out
- Will not elicit good quality of student effort if seen as add-on
- May create/reinforce misunderstanding of assessment as mere testing
- May be seen as a threat
- May become a missed opportunity to use more innovative approaches
- May invite finger-pointing

Solutions/responses:

- If norms, benchmarks are important, supplement with purchased test or work with a consortium of peer institutions
- Use on-campus expertise
- Pilot any test before large-scale administration
- Provide a “gripe sheet” where students can record confusion over wording, etc.
- Accept that assessment is ultimately human judgment, not psychometric science
- Keep the focus on useful information & improvement, not test scores per se
- Depersonalize issues, avoid finger-pointing

Commercially available, standardized tests:

Advantages:

- Are a traditional, widely recognized & accepted means of assessment
- Require little on-campus time or labor
- Prepare students for licensure, other high-stakes testing
- Are norm-referenced
- Offer longitudinal data, benchmarks
- Are technically high-quality
- May reflect recent, important trends in the field (e.g., ETS Major Field Tests)
- Can be useful as part of a multiple-method approach

Disadvantages:

- May offer poor content validity relative to local curriculum
- Generally do not provide criterion-referenced scores
- Test students’ ability to recognize “right” answers
- Reflect students’ test-taking ability
- Often elicit poor quality of student effort, particularly as add-on
- Reinforce faculty bias toward “empty vessel” theory of education
- Reinforce student bias toward education as memorizing, regurgitating “right” answers (i.e. “surface” rather than “deep” learning)
- May create/reinforce misunderstanding of assessment as testing
- Carry risk of misuse of scores, invidious comparisons
- Provide little insight into students’ problem-solving & thinking skills or ability to discriminate among “good” and “better” answers
- Offer no opportunity for test takers to construct their own answers verbally, numerically, graphically, or in other ways
- Give students no opportunity to demonstrate important affective traits, e.g., persistence, meticulousness,
creativity, open-mindedness.
- Time limits reduce ability of students to produce best efforts.
- Are less likely than local methods to stimulate productive discussion
- Are more likely to elicit finger-pointing, anxiety, resistance, cynicism
- Can be very expensive
- Generally do not provide good value (i.e., useful information relative to cost)

Solutions/responses:
- Test samples of students, use matrix sampling
- Negotiate with test maker to receive criterion-referenced scores
- Supplement with other methods
- Consider the Collegiate Learning Assessment, which does require students to construct their own answers but is not free of other disadvantages
- Use with caution

Direct or indirect? Some methods can work both ways . . .

Classroom research: Classroom research is included here as a direct method but it can function as either a direct or an indirect method. Of the dozens of classroom assessment techniques (CATs) developed by Cross and Angelo, some demonstrate what students know and can do, while others elicit reflection, perceptions, and other forms of indirect evidence.

Learning management programs: Through learning management programs, faculty can capture discussions and other evidence that would be ephemeral in the classroom; hence they are classified here as a direct method. Often such programs also include a survey or questionnaire template, however, that makes it easy to construct and administer surveys online. See discussion of surveys in handout on “Indirect Methods.”

Focus groups: Focus groups are generally regarded as an indirect method of assessment because students are encouraged to talk about their personal experiences and perceptions. However, they can also function as a direct method for assessing general education outcomes or the major. In this case focus groups become a form of performance. For example, the topic of discussion may be an issue in the major and students are guided by the protocol to demonstrate their command of disciplinary concepts, theories, and methods. Students generally do not receive a grade for their role in the discussion, but recordings of multiple focus groups may be analyzed by faculty to draw more general conclusions about the strengths and weaknesses of the major. Similarly, a discussion of world hunger, for example, may demonstrate students’ achievement of a general education outcome such as global awareness.

Portfolios: Portfolios can function as both a direct and an indirect assessment method. They are direct in the sense that student work is displayed and can be rated, providing direct evidence of knowledge and skills. Reflective essays, in which students look back on various pieces of their work, describe what each represented in terms of challenges or achievements, and evaluate their personal progress as learners, are indirect evidence of a high order.

Student self-assessment: Self-assessment is classified here as a direct method because the performance of self-assessment demonstrates directly how skilled students are at self-assessment. However, the process may be structured to elicit student reflection on how learning occurred, what helped or didn’t, etc. In other words, self-assessment can also function as an indirect method.
## PORTFOLIOS

**Rubric for Assessing the Use of Portfolios for Assessing Program Learning Outcomes**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Initial</th>
<th>Emerging</th>
<th>Developed</th>
<th>Highly Developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarification of Students’ Task</td>
<td>Instructions to students for portfolio development provide insufficient detail for them to know what faculty expect. Instructions may not identify outcomes to be addressed in the portfolio.</td>
<td>Students receive some written instructions for their portfolios, but they still have problems determining what is required of them and/or why they are compiling a portfolio.</td>
<td>Students receive written instructions that describe faculty expectations in detail and include the purpose of the portfolio, types of evidence to include, role of the reflective essay (if required), and format of the finished product.</td>
<td>Students in the program understand the portfolio requirement and the rationale for it, and they view the portfolio as helping them develop self-assessment skills. Faculty may monitor the developing portfolio to provide formative feedback and/or advise individual students.</td>
</tr>
<tr>
<td>Valid Results</td>
<td>It is not clear that valid evidence for each relevant outcome is collected and/or individual reviewers use idiosyncratic criteria to assess student work.</td>
<td>Appropriate evidence is collected for each outcome, and faculty have discussed relevant criteria for assessing each outcome.</td>
<td>Appropriate evidence is collected for each outcome; faculty use explicit criteria, such as agreed-upon rubrics, to assess student attainment of each outcome. Rubrics are usually shared with students.</td>
<td>Assessment criteria, e.g., in the form of rubrics, have been pilot-tested and refined over time; they are shared with students, and student may have helped develop them. Feedback from external reviewers has led to refinements in the assessment process. The department also uses external benchmarking data.</td>
</tr>
<tr>
<td>Reliable Results</td>
<td>Those who review student work are not calibrated to apply assessment criteria in the same way, and there are no checks for inter-rater reliability.</td>
<td>Reviewers are calibrated to apply assessment criteria in the same way or faculty routinely check for inter-rater reliability.</td>
<td>Reviewers are calibrated to apply assessment criteria in the same way, and faculty routinely check for inter-rater reliability.</td>
<td>Reviewers are calibrated; faculty routinely find that assessment data have high inter-rater reliability.</td>
</tr>
<tr>
<td>Results Are Used</td>
<td>Results for each outcome are collected, but they are not discussed among the faculty.</td>
<td>Results for each outcome are collected and discussed by the faculty, but results have not been used to improve the program.</td>
<td>Results for each outcome are collected, discussed by faculty, and used to improve the program.</td>
<td>Faculty routinely discuss results, plan needed changes, secure necessary resources, and implement changes. They may collaborate with others, such as librarians or Student Affairs professionals, to improve student learning. Students may also participate in discussions and/or receive feedback, either individual or in the aggregate. Follow-up studies confirm that changes have improved learning.</td>
</tr>
<tr>
<td>If e-Portfolios Are Used</td>
<td>There is no technical support for students or faculty to learn the software or to deal with problems.</td>
<td>There is informal or minimal formal support for students and faculty.</td>
<td>Formal technical support is readily available and proactively assists in learning the software and solving problems.</td>
<td>Support is readily available, proactive, and effective. Tech support personnel may also participate in refining the overall portfolio process.</td>
</tr>
</tbody>
</table>
How Visiting Team Members Can Use the Portfolio Rubric

Portfolios can serve many purposes besides assessment; in fact, these other purposes are actually much more common. Portfolios may be compiled so students can share their work with family and friends. They may be designed to build students' confidence by showing development over time or by displaying best work. They may be used for advising and career counseling, or so students can show their work during a job interview. The first thing a team needs to do is determine that the portfolios are used for assessment, and not for another purpose.

Conclusions about the quality of the assessment process should be based on discussion with relevant department members (e.g., chair, assessment coordinator, faculty, students) and a review of the program's written portfolio assignment. Two common types of portfolios are:

- Showcase portfolios—collections of each student's best work
- Developmental portfolios—collections of work from early, middle, and late stages in the student's academic career that demonstrate growth

Faculty generally require students to include a reflective essay that describes how the evidence in the portfolio demonstrates their achievement of their learning outcomes. Sometimes faculty monitor developing portfolios to provide formative feedback and/or advising to students, and sometimes they collect portfolios only as students near graduation. Portfolio assignments should clarify the purpose of the portfolio, what kinds of evidence should be included, and the format (e.g., paper vs. e-portfolios); and students should view the portfolio as contributing to their personal development.

The rubric has five major dimensions and a fifth dimension limited to e-portfolios:

1. **Clarification of Students' Task.** Most students have never created a portfolio, and they need explicit guidance. **Questions:** Does the portfolio assignment provide sufficient detail so students understand the purpose, the types of evidence to include, the learning outcomes to address, the role of the reflective essay (if any), and the required format? Do students view the portfolio as contributing to their ability to self-assess? Do faculty use the developing portfolios to assist individual students?

2. **Valid Results.** Sometimes portfolios lack valid evidence for assessing particular outcomes. For example, portfolios may not allow faculty to assess how well students can deliver oral presentations. Judgments about that evidence need to be based on well-established, agreed-upon criteria that specify (usually in rubrics) how to identify work that meets or exceeds expectations. **Questions:** Do the portfolios systematically include valid evidence for each targeted outcome? Are faculty using well-established, agreed-upon criteria, such as rubrics, to assess the evidence for each outcome? Have faculty pilot tested and refined their process? Are criteria shared with students? Are they collaborating with colleagues at other institutions to secure benchmarking (comparison) data?

3. **Reliable Results.** Well-qualified judges should reach the same conclusions about a student's achievement of a learning outcome, demonstrating inter-rater reliability. If two judges independently assess a set of materials, their ratings can be correlated. Sometimes a discrepancy index is used. How often do the two raters give identical ratings, ratings one point apart, ratings two points apart, etc.? Data are reliable if the correlation is high and/or if discrepancies are small. Raters generally are calibrated ("normed") to increase reliability. Calibration usually involves a training session in which raters apply rubrics to pre-selected examples of student work that vary in quality, then reach consensus about the rating each example should receive. The purpose is to ensure that all raters apply the criteria in the same way so that each student's product would receive the same score, regardless of rater. **Questions:** Are reviewers calibrated? Are checks for inter-rater reliability made? Is there evidence of high inter-rater reliability?

4. **Results Are Used.** Assessment is a process designed to monitor and improve learning, so assessment findings should have an impact. Faculty should reflect on results for each outcome and decide if they are acceptable or disappointing. If results do not meet their standards, faculty should determine what changes should be made, e.g., in pedagogy, curriculum, student support, or faculty support. **Questions:** Do faculty collect assessment results, discuss them, and reach conclusions about student achievement? Do they develop explicit plans to improve student learning? Do they implement those plans? Do they have a history of securing necessary resources to support this implementation? Do they collaborate with other campus professionals to improve student learning? Do follow-up studies confirm that changes have improved learning?

5. **If e-Portfolios Are Used.** Faculty and students alike require support, especially when a new software program is introduced. Lack of support can lead to frustration and failure of the process. Support personnel may also have useful insights into how the portfolio assessment process can be refined. **Questions:** What is the quality and extent of technical support? Of inclusion in review and refinement of the portfolio process? What is the overall level of faculty and student satisfaction with the technology and support services?
A decade ago, the Rose-Hulman Institute of Technology had a few simple goals. It wanted to sharpen its educational mission, broaden students’ skills, improve graduates’ job-placement rates, and give the institution better ammunition for proving its worth to accreditors.

It turned to the “electronic portfolio,” becoming one of a small but growing number of institutions using an old idea — the long-term compilation of student classwork — in a new computerized format that lets Rose-Hulman directly score student performance campuswide on a list of specific skills.

And now, as the Bush administration and Congress press colleges to do more to prove their worth, the concept is being seized upon by institutions as a way to provide quantitative proof of how they help students learn while keeping the right to define their own missions.

“Electronic portfolios are a way to generate learning as well as document learning,” said Barbara Cambridge, a co-director of the Inter/National Coalition for Electronic Portfolio Research, which organizes case studies by participating institutions. “And that’s one of the most exciting things about them.”

Hundreds of colleges use some type of electronic system for assembling and storing student work. But a few dozen, acting without federal direction and with little other outside coordination, have developed more sophisticated versions that guide assessment and curriculum development. They include both small institutions, such as Thomas College in Maine and Kapiolani Community College in Hawaii, and large ones, such as Minnesota’s state colleges and the University of Washington.

It’s not a simple or cost-free decision. Even supporters agree that making full use of electronic portfolios — computerized compilations of written assignments and exams, and even videos or artwork — can often be difficult, time-consuming, expensive, and fraught with frustration for faculty members and students, who may have to enter codes that indicate the portions of their work that satisfy various institutional requirements.

Some colleges “jump into them, [and then] they say, ‘Oh my gosh, how are we ever going to manage or afford this,’ and they back out of them,” said Lynn E. Priddy, director of education and training at the Higher Learning Commission of the North Central Association of Colleges and Schools, one of the nation’s six regional accrediting bodies.

As part of a well-designed program, however, an electronic portfolio can “really produce excellent information about what students are learning and how well,” Ms. Priddy said.

**An Early Adopter**

The Rose-Hulman Institute, which is known for its undergraduate science and engineering programs, is one of the nation’s earliest adopters of electronic portfolios and one of their most fervent advocates. The institute has designed three different versions of its own RosE Portfolio system over the past decade for its students to submit and store
their class work and materials electronically.

Rose-Hulman’s 1,800 students learn traditional technical skills in such subjects as chemistry, civil engineering, mathematics, and physics. The college has also established a series of “professional skills” it wants students to master in areas that include leadership, teamwork, communication, and ethics.

The process involves asking faculty members to consider all opportunities for incorporating those professional skills into existing courses. One assistant civil-engineering professor, James H. Hanson, asked students in his structural-mechanics class to consider ways of rebuilding New Orleans after Hurricane Katrina. But rather than calculate the optimal design for a new levee system, Mr. Hanson wanted his students to evaluate how various repair options might affect culture, economics, and public opinion in the storm-ravaged city.

At the end of each academic year, Rose-Hulman administrators gather faculty members who volunteer to work in two-person teams to review students’ electronic portfolios and determine how well the college did in each of 25 separate criteria that define the desired professional skills.

Because the portfolio software allows students to flag the portions of their work that apply to each criterion, the faculty reviewers can quickly find only those portions of the assignments — perhaps as little as a sentence or two — that apply to the criteria assigned to their team.

The results allow Rose-Hulman officials to see how effectively the college is teaching each of the skills and to revise its approach as necessary as the college seeks to establish a unified campuswide vision of what a Rose-Hulman education means.

Before Rose-Hulman adopted its electronic portfolio system, in 1997, departments and faculty members pursued separate missions, said Arthur B. Western, vice president for academic affairs and dean of the faculty. They operated, he said, like “independent contractors connected by a common plumbing system.”

**Federal Pressure**

Getting colleges to establish more systematic ways of setting goals and measuring their progress has been a key objective of Education Secretary Margaret Spellings. The secretary, in response to recommendations from her Commission on the Future of Higher Education, last year suggested a specific set of tests and other measures to judge and compare colleges. Under pressure from colleges, she later made clear that she believed each institution should define its own mission, as long as it developed clear methods for measuring that success.

Electronic portfolios give colleges that very opportunity, said Ms. Cambridge.

The tasks of setting institutionwide goals and overseeing faculty practices and curricula “are now more in potential for alignment than they probably have ever been,” she said. “And part of that is because we now have the evidence that can be collected and shared in e-portfolios.”
Electronic Portfolios May Answer Calls for More Accountability

Electronic portfolios simplify the process of setting learning objectives and meeting them, said Peter T. Ewell, vice president of the National Center for Higher Education Management Systems. And as the advantages of electronic portfolios become clearer, he said, he expects more institutions to begin to use them.

Many already have. Institutions that use such systems as part of a comprehensive approach to measuring self-improvement include Alverno College, George Mason University, Indiana University-Purdue University at Indianapolis, and the for-profit, online Capella University chain.

Other colleges are trying it on a more-limited basis, such as within a particular academic discipline. Electronic portfolios are being used in programs of writing at the University of Georgia, psychology at Clemson University, and education at Virginia Tech and the University of Nebraska at Omaha.

Such colleges report various advantages of electronic portfolios, some of which mirror the reasons that elementary and secondary schools and colleges pioneered the use of paper-based portfolios to track student work a century ago.

In addition to the institutionwide benefits, research is suggesting additional direct benefits for students. In recent reports to the Inter/National Coalition on Electronic Portfolio Research, institutions describe the process of keeping a portfolio as fundamental for promoting in students deeper self-reflection and deeper understanding of their subjects.

Bowling Green State University submitted a report to the coalition showing that, on average, undergraduates using electronic portfolios had higher grade-point averages, credit hours earned, and retention rates than a comparable set of students who did not use the system.

LaGuardia Community College found that its students, about 70 percent of whom are immigrants, began writing their assignments with greater care and clarity, understanding that the electronic format meant family members in foreign countries might sometime be able to read them. “That taps into an intrinsic motivation” for students to submit their best work, said Kathleen Blake Yancey, an English professor at Florida State University who serves as co-director with Ms. Cambridge at the research coalition.

Portfolios of student work have long played a role in helping graduates find jobs in fields like art and engineering, and the ease of using an electronic version could help expand that use to other fields. A theater major at Winona State University, in Minnesota, helped himself win a human-resources job by including in his electronic portfolio a video of himself directing a stage rehearsal to show his management skills, Ms. Cambridge said.

At least two institutions, Florida State University and the University of Waterloo, in Canada, ask prospective employers what skills they would like to see reflected in an electronic portfolio presented by job applicants so the institutions can incorporate that information into their designs, she said.
Electronic Portfolios May Answer Calls for More Accountability (4)

Colleges Doing It on Their Own
Much of this work is being done at institutions without help from the federal government or outside groups. The Spellings commission, while recommending colleges adopt standardized tests or measures such as the Collegiate Learning Assessment and the National Survey of Student Engagement, never mentioned electronic portfolios in its 76-page final report in 2006.

The commission’s chairman, Charles Miller, said he would want colleges using electronic portfolios to also use a common tool like the Collegiate Learning Assessment but agrees that the portfolios could be a valuable additional method for a college to prove its worth. It “could be a revolutionary thing,” he said.

It wasn’t until last fall that the U.S. Education Department announced its first expenditure related specifically to electronic portfolios. The department is giving $2.4-million for national college associations to study various assessment tools, with about a third of that money devoted to electronic portfolios.

The electronic-portfolio part of the study is being handled by the Association of American Colleges and Universities, which plans to compile a list of the most commonly used criteria in areas such as writing, oral communication, and critical and analytical thinking, and then test the use of those criteria at a group of 12 colleges.

In the meantime, colleges and their accreditors are moving ahead — and businesses and other groups are beginning to crop up to help them. Several colleges are working with the Minnesota-based eLumen Collaborative to develop a system that goes beyond the electronic portfolio model by having professors record their assessments of student performance based on institutional criteria, rather than ask the students to code their own work. Liaison International, in Massachusetts, is developing a product to help colleges present their performance data to accreditors. Accreditors such as the North Central Association and the Western Association of Schools and Colleges have been helping both their member institutions and their own program-review officers understand and use electronic portfolios.

Obstacles remain to making electronic portfolios work smoothly. Even at Rose-Hulman, barely half of faculty members require their students to participate in the RosE system. Some professors abstain because they prefer to use paper and blackboards, while others are so technologically advanced that they have developed their own Web sites and aren’t eager to make them conform to the university’s system, said Julia M. Williams, the college’s chief of planning and assessment.

Such experiences may be daunting for other colleges, given that Rose-Hulman’s faculty and staff members and students have spent incalculable amounts of time and money developing the process. University officials said they would not offer even a ballpark figure of the total cost, in part because of nondisclosure agreements they signed with software companies that helped them build their system.
Electronic Portfolios May Answer Calls for More Accountability (5)

“It takes deep understanding on the part of the administration, a willingness to experiment and innovate on the part of the faculty,” said Ms. Priddy, whose commission accredits Rose-Hulman. “And, many times, lots of money.”

In structuring its portfolio system, Rose-Hulman began knowing what it hoped to accomplish and then built the technology to fit it, Ms. Priddy said. Too many other colleges are starting out “using technology in search of a problem,” she said. Colleges motivated more by a desire to show results externally, rather than promote positive change internally, will probably end up paying for a system that produces only limited benefits, Ms. Priddy said.

Practical Uses
Joel M. Anderson, who graduated from Rose-Hulman last year and now works as an apprentice structural engineer in Arizona, has a sense of what a well-designed electronic portfolio system could mean for students.

When Mr. Hanson, the engineering professor, gave his junior-year class the Hurricane Katrina assignment, Mr. Anderson found it bothersome.

“The course alone didn’t necessarily need to have anything to do with ethical questions,” recalls Mr. Anderson, who works for HDR Inc. in Phoenix. “I guess as a student, I was a little bit annoyed that we had to do this work that didn’t seem to have too much to do with the course.”

Mr. Anderson and other students also say they were troubled, especially in the early years of the RosE system’s development, by having to tediously code passages in their class assignments so that faculty members could track the criteria they evaluate at the end of the year.

But now that he has entered the job market, Mr. Anderson says he understands that Rose-Hulman was trying to promote qualities such as leadership, teamwork, and ethical decision making that can help him in his career just as much as his ability to calculate the strength of a levee in New Orleans.

Among Mr. Anderson’s biggest regrets now is that the electronic-portfolio system wasn’t more developed by the time he graduated. Many engineering firms around his hometown, near Indianapolis, would only hire civil engineers with master’s degrees, forcing him to find his first job more than 1,700 miles away. If he had had an electronic portfolio in a format that could have been presented to a prospective employer, he believes he could have proven himself as talented as a candidate with an advanced degree, and might not have had to leave his home state after graduation.

“There’s a possibility that if recruiters were familiar with this e-portfolio system and I showed it,” he said, “then maybe they would have looked more at it.”
### CAPSTONES

**Rubric for Assessing the Use of Capstone Experiences for Assessing Program Learning Outcomes**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Initial</th>
<th>Emerging</th>
<th>Developed</th>
<th>Highly Developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant Outcomes and Lines of Evidence Identified</td>
<td>It is not clear which program outcomes will be assessed in the capstone course.</td>
<td>The relevant outcomes are identified, e.g., ability to integrate knowledge to solve complex problems; however, concrete plans for collecting evidence for each outcome have not been developed.</td>
<td>Relevant outcomes are identified. Concrete plans for collecting evidence for each outcome are agreed upon and used routinely by faculty who staff the capstone course.</td>
<td>Relevant evidence is collected; faculty have agreed on explicit criteria statements, e.g., rubrics, and have identified examples of student performance at varying levels of mastery for each relevant outcome.</td>
</tr>
<tr>
<td>Valid Results</td>
<td>It is not clear that potentially valid evidence for each relevant outcome is collected and/or individual faculty use idiosyncratic criteria to assess student work or performances.</td>
<td>Faculty have reached general agreement on the types of evidence to be collected for each outcome; they have discussed relevant criteria for assessing each outcome but these are not yet fully defined.</td>
<td>Faculty have agreed on concrete plans for collecting relevant evidence for each outcome. Explicit criteria, e.g., rubrics, have been developed to assess the level of student attainment of each outcome.</td>
<td>Assessment criteria, such as rubrics, have been pilot-tested and refined over time; they usually are shared with students. Feedback from external reviewers has led to refinements in the assessment process, and the department uses external benchmarking data.</td>
</tr>
<tr>
<td>Reliable Results</td>
<td>Those who review student work are not calibrated to apply assessment criteria in the same way; there are no checks for inter-rater reliability.</td>
<td>Reviewers are calibrated to apply assessment criteria in the same way or faculty routinely check for inter-rater reliability.</td>
<td>Reviewers are calibrated to apply assessment criteria in the same way, and faculty routinely check for inter-rater reliability.</td>
<td>Reviewers are calibrated, and faculty routinely find assessment data have high inter-rater reliability.</td>
</tr>
<tr>
<td>Results Are Used</td>
<td>Results for each outcome may or may not be are collected. They are not discussed among faculty.</td>
<td>Results for each outcome are collected and may be discussed by the faculty, but results have not been used to improve the program.</td>
<td>Results for each outcome are collected, discussed by faculty, analyzed, and used to improve the program.</td>
<td>Faculty routinely discuss results, plan needed changes, secure necessary resources, and implement changes. They may collaborate with others, such as librarians or Student Affairs professionals, to improve results. Follow-up studies confirm that changes have improved learning.</td>
</tr>
<tr>
<td>The Student Experience</td>
<td>Students know little or nothing about the purpose of the capstone or outcomes to be assessed. It is just another course or requirement.</td>
<td>Students have some knowledge of the purpose and outcomes of the capstone. Communication is occasional, informal, left to individual faculty or advisors.</td>
<td>Students have a good grasp of purpose and outcomes of the capstone and embrace it as a learning opportunity. Information is readily available in advising guides, etc.</td>
<td>Students are well-acquainted with purpose and outcomes of the capstone and embrace it. They may participate in refining the experience, outcomes, and rubrics. Information is readily available.</td>
</tr>
</tbody>
</table>
How Visiting Team Members Can Use the Capstone Rubric

Conclusions should be based on discussion with relevant department members (e.g., chair, assessment coordinator, faculty). A variety of capstone experiences can be used to collect assessment data, such as:

- courses, such as senior seminars, in which advanced students are required to consider the discipline broadly and integrate what they have learned in the curriculum
- specialized, advanced courses
- advanced-level projects conducted under the guidance of a faculty member or committee, such as research projects, theses, or dissertations
- advanced-level internships or practica, e.g., at the end of an MBA program

Assessment data for a variety of outcomes can be collected in such courses, particularly outcomes related to integrating and applying the discipline, information literacy, critical thinking, and research and communication skills.

The rubric has five major dimensions:

1. **Relevant Outcomes and Evidence Identified**. It is likely that not all program learning outcomes can be assessed within a single capstone course or experience. **Questions**: Have faculty explicitly determined which program outcomes will be assessed in the capstone? Have they agreed on concrete plans for collecting evidence relevant to each targeted outcome? Have they agreed on explicit criteria, such as rubrics, for assessing the evidence? Have they identified examples of student performance for each outcome at varying performance levels (e.g., below expectations, meeting, exceeding expectations for graduation)?

2. **Valid Results**. A valid assessment of a particular outcome leads to accurate conclusions concerning students’ achievement of that outcome. Sometimes faculty collect evidence that does not have the potential to provide valid conclusions. For example, a multiple-choice test will not provide evidence of students’ ability to deliver effective oral presentations. Assessment requires the collection of valid evidence and judgments about that evidence that are based on well-established, agreed-upon criteria that specify how to identify low, medium, or high-quality work. **Questions**: Are faculty collecting valid evidence for each targeted outcome? Are they using well-established, agreed-upon criteria, such as rubrics, for assessing the evidence? Have faculty pilot tested and refined their process based on experience and feedback from external reviewers? Are they sharing the criteria with their students? Are they using benchmarking (comparison) data?

3. **Reliable Results**. Well-qualified judges should reach the same conclusions about individual student’s achievement of a learning outcome, demonstrating inter-rater reliability. If two judges independently assess a set of materials, their ratings can be correlated. Sometimes a discrepancy index is used. How often do the two raters give identical ratings, ratings one point apart, ratings two points apart, etc.? Data are reliable if the correlation is high and/or if the discrepancies are small. Raters generally are calibrated (“normed”) to increase reliability. Calibration usually involves a training session in which raters apply rubrics to pre-selected examples of student work that vary in quality, then reach consensus about the rating each example should receive. The purpose is to ensure that all raters apply the criteria in the same way so that each student’s product receives the same score, regardless of rater. **Questions**: Are reviewers calibrated? Are checks for inter-rater reliability made? Is there evidence of high inter-rater reliability?

4. **Results Are Used**. Assessment is a process designed to monitor and improve learning, so assessment findings should have an impact. Faculty should reflect on results for each outcome and decide if they are acceptable or disappointing. If results do not meet faculty standards, faculty should determine which changes should be made, e.g., in pedagogy, curriculum, student support, or faculty support. **Questions**: Do faculty collect assessment results, discuss them, and reach conclusions about student achievement? Do they develop explicit plans to improve student learning? Do they implement those plans? Do they have a history of securing necessary resources to support this implementation? Do they collaborate with other campus professionals to improve student learning? Do follow-up studies confirm that changes have improved learning?

The Student Experience. Students should understand the purposes different educational experiences serve in promoting their learning and development and know how to take advantage of them; ideally they should also participate in shaping those experiences. Thus it is essential to communicate to students consistently and include them meaningfully. **Questions**: Are purposes and outcomes communicated to students? Do they understand how capstones support learning? Do they participate in reviews of the capstone experience, its outcomes, criteria, or related activities?
Assessment How-to: Capstone Experiences

The first half of this document defines and discusses the capstone experience. The latter half covers using capstones for program assessment.

The Capstone Experience
Definition: The capstone experience is a culminating set of experiences that captivate, encapsulate, synthesize, and demonstrate learning.

Keys to the Capstone
1. The capstone should be a culminating set of personal, academic, and professional experiences.
   - In a capstone course, students synthesize, integrate, and/or apply their previous knowledge, rather than acquire new knowledge or skills. Students demonstrate mastery, not learn new knowledge/skills.
   - A capstone should be structured near the end of the program. [Tip: schedule the capstone course before the student’s last semester in case remediation is needed.]
   - Student ownership, responsibility, and engagement should be central to the capstone.
2. Rationale for the framework (see below) should be based on the specific needs of the program/discipline.
3. The products (e.g., written assignments) of the capstone should be designed to help assess the program’s desired outcomes.
4. Discussion, reflection, and/or demonstration of general education and/or institutional outcomes should be evident in the capstone. [Note: some general education outcomes may not be relevant, but a capstone experience can likely address these general education outcomes: effective written and oral communication, ethical decision making, information accessing and information processing, problem solving, inquiry and analysis methods.
5. Satisfactory completion of the capstone experience should be required for graduation.
6. Full-time (tenured) faculty members should facilitate, mentor, and/or coordinate the capstone experience.

Frameworks for a Capstone Experience
There are four common frameworks for capstones. Programs typically choose one as the primary framework based on their program’s needs. If/when appropriate, the other frameworks may also be incorporated or acknowledged

1. **Mountaintop.** Students from 2 or more disciplines (or specializations) engage in interdisciplinary inquiry. For example, English majors and Computer Science majors enroll in their major’s capstone courses and are paired with a student from the other discipline. The pair of students complete an interdisciplinary project.
2. **Magnet.** Students pull together their learning from multiple courses and/or experiences.
3. **Mandate.** Students document their learning in relation to external industry/professional standards or requirements.
4. **Mirror.** Students reflect on their experiences and metacognitive skills in relation to program goals and outcomes.
Assessment How-to: Capstone Experiences (2)
Options for Courses/Activities within the Capstone Experience

A capstone experience can consist of one or a combination of these:
- A major/discipline-based course
- An interdisciplinary course with a minimum of two distinctly different disciplines represented
- An out-of-class/co-curricular experiences
- A service- and/or community-based learning experience
- An application/demonstration of knowledge (e.g., thesis, design project, portfolio development)
- A college-to-work/career transition experiences (e.g., internship, informational interviewing)

Pedagogic Practices for Capstone Experiences

Professors typically use some of the following teaching strategies and methods in capstone experiences:

- **Collaborative learning:** “Collaborative learning is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together. Usually, students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product... Most center on students’ exploration or application of course material, not simply the teacher’s presentation or explication of it. Collaborative learning represents a significant shift away from the typical teacher-centered or lecture-centered milieu in college classrooms.” Collaborative Learning: A Sourcebook for Higher Education (1992) by Anne S. Goodsell et al., National Center on Postsecondary Teaching. Available thru interlibrary loan from UH Hilo, LB1032.C65.1992.

- **Self-directed learning:** Students have choices about their learning as well as responsibility for the consequences associated with those choices. The faculty member (or internship supervisor, co-op employer, etc.) establishes the necessary structures to guide and support students while still leaving the students to do such things as establish goals, create time lines, monitor progress, develop products for evaluation, etc.

- **Problem-based learning:** Faculty members give students an ill-defined task to complete or an open-ended problem to solve. The faculty member acts as a mentor, coach, and/or facilitator. Often the task/problem mirrors an actual, discipline-based task/problem but it has been simplified or structured to match the level of the students.

- **Learner-centered** (Learner-centered = a focus on what the students are learning and doing and not on what the professor is delivering or doing). Faculty members design assignments that promote critical thinking, integration, reflection, synthesis. They give students assignments and activities that encourage students to “suspend judgment, maintain a healthy skepticism, and exercise an open mind”; professors design activities that call for the “active, persistent, and careful consideration of any belief in light of the ground that supports it.” [Taken from: http://www2.gsu.edu/~dscjlb/wwwcrit.html, whose source is John Dewey’s How We Think: A Restatement of the Relation of Reflective Thinking in the Educatvie Process (1933). Available at Hamilton Library BF455.D5.1933.]
Assessment How-to: Capstone Experiences (3)

Discussion Questions for Faculty Members as They Consider a Program Capstone Experience

1. What framework best meets the needs of the program and its goals?
   - An interdisciplinary, synthesizing experience?
   - A discipline-specific, synthesizing experience?
   - A method to satisfy external industry/professional standard or requirements?
   - A reflective, synthesizing experience?

2. Is it necessary to satisfy discipline/profession accreditation requirements?

3. In what ways will the capstone experience be beneficial to the students’ post-baccalaureate experience?

4. In what ways will the capstone experience support the (relevant) general education requirements?

5. What components of the capstone experience will address students’ personal growth? Academic growth? Professional growth?

6. How will students be guided toward and prepared for the capstone experience? What program structures will be in place (e.g., course requirements, pre-requisites, advising)?

Using a Capstone Experience for Program Assessment

When using a capstone experience for program assessment, the standard assessment loop is followed: establish outcomes, create learning opportunities, undertake an assessment process, interpret assessment results, and create and implement an action plan for improvement.

Establish Student Learning Outcomes & Determine Learning Opportunities

- The program creates desired Student Learning Outcomes (SLOs) [How to develop outcomes].
- The program deliberately incorporates learning opportunities—activities and assignments—into the curriculum and capstone experience so that students can achieve the desired SLOs. Typically, the program can assess all or nearly all program SLOs using the capstone experience. A well-designed curriculum plotted on a curriculum map illustrates how and where SLOs are introduced, reinforced, and then mastered and demonstrated in the capstone experience. [How to create a curriculum map].

Assessment Process: Collecting and Evaluating/Analyzing Evidence

The assessment process should lead to a discussion of the program as a whole—not only a discussion of the capstone experience.

The program typically builds evidence-generating, -collecting, and -evaluating mechanisms into the capstone experience.

Collecting Evidence of Student Learning

When designing the capstone experience, programs build in assignments/activities that can shed light on the SLOs and relevant general education outcomes. The assignments/activities serve as evidence of student achievement. Students can complete them over time [How to develop portfolios] or in a single, culminating course.
Examples of assignments/activities:
- Written documents: research report, thesis, proposal, case study, project report, reflective essay, review of the literature, resume, progress reports, informal writing (notes, lab notebook, observation log, informal analyses, academic journal, etc.)
- Oral presentation(s)
- Poster presentation(s)
- Documentation of group work: peer review/feedback, group progress reports, evaluation of group members/group effectiveness
- Internship supervisor’s evaluation/feedback on student performance
- Interview (e.g., mock job interview, oral defense)
- Meeting facilitation (e.g., students facilitate a community meeting)
- Exam(s) (locally-developed, state, or national)

Evaluation of Evidence of Student Learning
Most capstone experiences include a senior-level course. The course instructor can assist the students in preparing evidence for evaluation.
- Good practices:
  - Take a (random) sample of students and evaluate their work for the purposes of program assessment.
  - Use a rubric to evaluate qualitative materials such as written reports, short-answer exam questions, oral presentations, etc.
  - Provide the rubric to the students.
    ◊ Have professors use the rubric in other courses that introduce or reinforce the SLO.
    ◊ Have each professor apply the rubric in the same way. Use examples of student performance at varying levels of mastery to calibrate professors/reviewers.
  - Have at least two faculty members evaluate the evidence using criteria agreed upon by the faculty (e.g., use an agreed-upon rubric).
  - Have external faculty members and/or business community members evaluate the student work.

Collecting Evidence of Student Perceptions
- Programs can also collect evidence of students’ perceptions in capstone experiences.
  Examples of data-collection methods:
  - End-of-course or end-of-program surveys
  - Exit interviews
  - Focus groups
  - Blogs

Evaluation of Evidence of Student Perception
- Quantitative data (e.g., Likert scale data) can be summarized using descriptive statistics.
- Open-ended survey responses, interview data, focus group data, blogs, etc., can be analyzed using qualitative methods to identify themes and areas of consensus.
Assessment How-to: Capstone Experiences (5)

Assessment Results
The goal of assessment is to provide the program with information it can use to be self-reflective and self-improving. Presenting the results does not need to be complicated. A simple, straightforward presentation of who, what, where, when, and how often suffices. [How to report results] Discussion of the results should focus on the SLO(s) and the program, not on individuals.

Action Plan for Improvement
Programs use assessment results to guide program decision making and improve their effectiveness. By periodically discussing assessment, when needed, faculty can plan and implement improvements to the capstone experience. The focus should be on the program and the learning opportunities (e.g., activities throughout the program, all required courses, etc.), not on individuals.

Assessment: Rubric & Checklist
The Western Association of Schools and Colleges (WASC) created a rubric to assess programs that use the capstone experience as the basis for program assessment. Programs can use the WASC rubric to self-assess their progress. Below is a checklist based on the WASC rubric,

Checklist. The program has:

1. Identified the relevant program SLOs that will be assessed using the capstone experience.
2. Identified lines of evidence and routinely collect that evidence
3. Developed explicit evaluation criteria (e.g., rubrics)
4. Identified examples of student performance at varying levels of mastery for each outcome.
5. Pilot tested and refined evaluation criteria (e.g., rubrics). Used feedback from external reviewers to improve the assessment process; used external benchmarking data.
6. Informed students of the evaluation criteria.
7. Calibrated those who apply the evaluation criteria and routinely check inter-rater reliability.
8. Informed students of the purpose and outcomes of the capstone and students embrace the capstone experience.
9. Made information about the capstone readily available.

FOOTNOTE #1. Sources
“Toward a Model for Capstone Experiences: Mountaintops, Magnets, and Mandates” by C.J. Rowles, D.C. Koch, S.P. Hundley, & S.J. Hamilton. Assessment Update, Jan/Feb 2004, 16(1)
“Capstone Experiences and Their Uses in Learning and Assessment,” workshop by S.P. Hundley, Assessment Institute (sponsored by IUPUI), October 2008.

updated 01/08/2010
Avoiding complications like test anxiety is one benefit of a method for evaluating difficult-to-capture abilities.

Colleges no longer simply want to know what their students know, but how they think.

Higher-order thinking skills are “something that schools are paying a little bit more attention to these days,” says Jeffrey Steedle, a measurement scientist at the Council for Aid to Education, whose Collegiate Learning Assessment essays are used at several hundred colleges to test students’ abilities to synthesize arguments and write persuasively. “It’s largely in response to the recognition that these skills are needed to be competitive in the global marketplace.”

But educators also say that paper-and-pencil examinations have limits—for one thing, knowing that you are being tested can drag down performance—and they are looking for new methods to measure skills like critical thinking, creativity, and persistence.

Valerie J. Shute, an associate professor of educational psychology and learning systems at Florida State University, believes she has a solution in “stealth assessment”—the administering of tests without students’ knowing.

To do that, Ms. Shute and other stealth-assessment researchers have turned to video games, which let educators watch students solve complex tasks while immersed in virtual worlds. How students react to new challenges and put evidence together—without the pressure of test proctors breathing down their necks—can reveal a lot about creative problem-solving skills that traditional testing cannot deliver. “A lot of important stuff happens when playing games,” Ms. Shute said. “You’re just doing. You’re in the process.”

Ms. Shute, who first studied stealth assessment with a video game for undergraduate students more than 20 years ago, sees applications for students of all ages. She is now helping two of her graduate researchers test the technology with sixth graders in Florida, and she is already looking for new ways to use the technique in her graduate courses.

“Everybody likes to play,” she says. “And so much could be done using games.”

Matthew Ventura, an associate research scientist at the Educational Testing Service who worked on stealth-assessment research with Ms. Shute, says the technique will be especially helpful in eliminating test anxiety, which can hurt students’ performance. That and its potential to test intangibles like creativity and problem solving, he said, make the technique attractive to educators and video-game developers alike.

**Virtual Worlds, Real Skills**

Educators have long believed that video games and virtual worlds could be used to supplement classroom instruction, although not necessarily as testing tools.
A ‘Stealth Assessment’ Turns to Video Games to Measure Thinking Skills (2)

In 1986, when Ms. Shute was a postdoctoral fellow at the Learning Research and Development Center at the University of Pittsburgh, she designed a computer game to teach undergraduates the principles of microeconomics. The game was set in the virtual farming community of Smithtown, where students could play around with different economic factors—like product price, labor costs, and population size—to see how they affected the market. A student who decided to raise the price of coffee, for instance, would see demand for his or her product fall as a result. The software also let students plug in hypotheses about the outcome of their experiments.

On its surface, the game was a way for students to get acquainted with basic economic ideas—and maybe have a little fun in the process.

But it was also teaching students a deeper lesson about scientific inquiry. If they changed too many inputs at once, they found it difficult to determine what caused a sudden change in the market, and had to go back and experiment with the inputs to determine exactly what was happening.

The question that grew out of Smithtown, Ms. Shute says, was, “Wouldn’t it be lovely to actually pass along the log files of what students did in order to look at their scientific-inquiry skills?”

Since then, Ms. Shute has been working on a framework to help educators design and execute stealth assessment.

She looks first to the core competencies—critical thinking, empathy, persistence—that she wants to test, then breaks them down into smaller goals. She can then tie those theoretical skills to actual tasks in a video game. For instance, an instructor looking to test a student’s grasp of systems thinking—understanding the complex relationships among parts of a whole—might ask players to complete tasks that show information gathering, developing hypotheses, and tracing causal relationships.

Rather than conducting a one-off exam, Ms. Shute says, continuing stealth assessment “enables you to have a very systematic representation of the stuff you’re interested in.”

But for Ms. Shute, stealth assessment is not just about gathering data. It’s also about improving teaching.

If instructors know where students need the most help, they can quickly tweak their courses—and their games—to make up for those deficiencies. Students who need help developing critical-thinking skills, for instance, may be asked to repeat a level or to take on additional tasks in the game until their performance is satisfactory—all without interrupting their play. “The idea of stealth assessment is really to make it merge into the fabric of the learning environment,” Ms. Shute says. “My goal is to blur the distinction between learning and assessment.”

Crunching all the data on student performance and tweaking computer games were major tasks in the days of Smithtown, but today’s technology is making it possible to test increasingly complex critical thinking using virtual worlds.
A ‘Stealth Assessment’ Turns to Video Games to Measure Thinking Skills

Taiga Park, a computer game developed by the University of Indiana’s Center for Research on Learning & Technology, is one of Ms. Shute’s favorite vehicles for stealth assessment. On its surface a game about ecology, Taiga Park requires players to look for the cause of a widespread fish die-off in a virtual river by “interviewing” park rangers, environmental scientists, and the owners of a logging company. While students learn about pH levels and runoff, they also come away with lessons on data analysis, complex cause-and-effect relationships, and communication.

With the stealth-assessment framework behind it, Oktay Donmez and Yoon Jeon Kim, two of Ms. Shute’s graduate students at Florida State, are planning to test Taiga Park with about 50 sixth graders. Starting in the spring, the researchers will study the students’ performance data from the game to see how effective stealth assessment is at measuring their complex thinking.

“My goal is not only to design, develop, and implement stealth assessment within a game, but also to test its effectiveness,” Mr. Donmez says.

Although much of the research in the field—especially when dealing with elementary and secondary students—is centered on video games, Ms. Shute is quick to point out that stealth assessment is widely applicable as a tool, not just a game.

Working with Florida State graduate students in a course called “How to Write Excellent Literature Reviews,” Ms. Shute found that she could use routine assignments—like peer reviews and summaries of research material—to analyze her students’ higher-order thinking skills. All assignments can be linked back to a larger skill, she says. “Evidence is everywhere.”

Ms. Shute also hopes that stealth assessment might engage students unmoved by traditional teaching and testing.

“We have this whole group of kids who are not engaged with school, and appropriately so, because schools are so antiquated,” she says.

With field research on stealth assessment still ahead of them, both Ms. Shute and her students are optimistic about the technology, especially for a generation of students who grew up with video games at home.

“They’re going to play video games anyway,” Ms. Kim says. “We can actually embed something that can help them learn.”
Almost Painless Embedded Assessment

Woodbury University Faculty Workshop August 23, 2008
Facilitators: Vic Liptak, Paul Decker, and Doug Cremer

Why assess? Why use assignments embedded in a course to assess?

Three reasons:
1. To know with better clarity and precision how well students are learning so adjustments and innovations can be made
2. To use creatively already existing student work assignments as evidence and current departmental standards as evaluation criteria
3. To communicate results to and share learning with one’s colleagues and use this information to improve teaching and learning quality.

What will it do for you and your students:
1. Clearly link what you expect them to know and do with how you will evaluate them
2. Allow you to make more creative adjustments to your teaching approaches in response to student performance
3. Create evidence of effective and innovative teaching for use in contract renewal, promotion or applying for new positions.

Assessment in three easy steps:
1. Expectations (Outcomes): What are your and your department’s expectations about what students will learn in terms of knowledge, skills and values? These are your educational outcomes.
2. Assignments and Grades (Evidence and Measurements): What do you (or could you) ask students to do in order to demonstrate that they have met these expectations (direct, indirect measures; qualitative, quantitative methods) and on what explicit criteria do you evaluate them? These represent your evidence and measurements.
3. Feedback and Revision (Evaluation and Improvement): What kind of specific feedback do you give students about their performance and what kind of concrete suggestions do you make to them about future revisions? These are your means of evaluation and improvement (for the students and yourself).

Note: Make the Implicit Explicit...
Making the Implicit Explicit
(and therefore sharable)

How to get started (and move ahead):

Start with what you already have, what you already know. Imagine your typical grade book. A column of names down the left-hand margin; a row of criteria or assignments across the top; a matrix of scores and grades littered between. What kinds of assignments are listed there? What kinds of marks are recorded there? Are there any patterns that emerge?

Look at the example on the next page. A professor uses a grade sheet to notice that there is a consistently weak aspect of student performance: the research paper. This is a good start, since writing a good research paper is a course expectation. If she has more detailed records of how students did on various aspects of the paper: organization, thesis, use of evidence, strength of argument, etc., she might be able more clearly to pinpoint the source of the problem.

She could also ask and see if other professors have similar issues (which we all usually do over a beer or a cup of coffee). She could ask her students what they find difficult about the assignment (an indirect assessment). She could take this information and then change her approach to teaching the research paper, repeat the analysis on the next terms or terms, and see if there is a result (a process of revision we are all familiar with).

Going further, she could ask her colleagues to save copies of their students’ research papers (they are all probably buried in the e-mail archive or on their hard drives anyway). They could look at their common student work seeking common strengths and weaknesses. They could put their heads together to come up with new, innovative and creative strategies to address their findings. Lastly, they could put their observations, conclusions, and recommendations into a brief report and refer back to it in a year when they gather again to see if their innovations created any significant change in the quality of their students’ work.
Embedded Assessments

Embedded assessments are assignments, activities, or exercises that are done as part of a class, but that are used to provide assessment data about a particular learning outcome. The course instructor and/or other evaluators can evaluate the student work, often using a rubric.

Consider this class:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Student 1</th>
<th>Student 2</th>
<th>Student 3</th>
<th>Student 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm exam</td>
<td>A</td>
<td>C</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Research Paper</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Final Exam</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td><strong>Final Grade</strong></td>
<td><strong>A</strong></td>
<td><strong>B</strong></td>
<td><strong>B</strong></td>
<td><strong>B</strong></td>
</tr>
</tbody>
</table>

The final grades in the course show how well the individual students mastered the course material, but they don’t suggest how well the class—as a whole—did on any particular aspect of the course material.

Imagine that the department has a learning outcome that students conduct original research and write a paper discussing their results. By using the second assignment in this class, the department can compile the grades of students completing the assignments and gain data to assess this learning outcome. From the class example listed above, it would be clear that writing a research paper is a weakness of this group of students. The research paper, then, is an embedded assessment that is done as part of the course, but the results of which are pulled from the course and applied to the learning outcomes.

From Minnesota State University Moorhead:
http://www.mnstate.edu/assess/Embedded.htm
Want to go further?

1. First look at three things:
   a. A particular expectation or outcome you have in a course: one of the reasons why they take this course (yours and the department’s)
   b. One kind of assignment and work you ask students to do: discussions, quizzes, exams, presentations, drawings, mixed media, papers, diagrams, etc.
   c. The relationship between these first two: where and how in the work do they show you the accomplishment of the particular expectation (or maybe they don’t)?

2. Now look at three more:
   a. The method and criteria you use to evaluate students’ work: factual accuracy, quality of analysis, creativity of expression, precision of presentation, etc.
   b. The way you communicate that evaluation to them: oral and/or written comments, numeric percentages or scores, letter grades
   c. The relationship between these second two: how do the criteria conform to the expectation and how does the communication of the evaluation lead a student to create better work?

3. Take a few more steps:
   a. Do you know how well your students generally perform on this particular assignment aligned to this expectation or outcome?
   b. Do you know how well your colleagues’ students perform on similar assignments aligned to similar expectations or outcomes?
   c. What have you and/or your colleagues done either to maintain quality or improve student performance based on this information?

4. Get others to join the party:
   a. Organize a group of colleagues who work in the same field and look for the same outcomes
   b. Develop a rubric (descriptions of characteristic performances used to rate student work on one or more criteria) with which to see what strengths and weaknesses of student performance are revealed
   c. Compare this result with your own records and intuitions so you and your colleagues can develop a creative and innovative approach to helping students learn better

Lather, rinse, and repeat as necessary…
Conclusions

This is what *embedded assessment* is all about -- creating a cycle of examination, reflection and action:

1. using course and department expectations and outcomes,
2. evaluating student work both by the individual professor and by a group of colleagues,
3. creating a set of recommendations for change based on the evaluation,
4. making a record of the work done and the conclusions reached,
5. undertaking a re-examination of the issue at a later date.

One last point:

In step three above, you may find that you want to introduce a new kind of assignment or exercise in your course to get a better handle on how well your students are learning a particular expectation or outcome.

There are all sorts of things you can do, from short one-minute papers to check for comprehension or questions, to on-line forums for more informal discussions of topics, to having students collect work in a portfolio and writing a reflection on their learning. The Institute for Excellence in Teaching and Learning has a host of resources for you to explore. Drop on by and talk to Paul. And of course Voc and Doug are always available to talk things over.

See Assessment Handbooks at:
Minnesota State University Moorhead (the basics)
http://www.mnstate.edu/assess/
Skidmore College (more advanced)
http://hudson2.skidmore.edu/administration/assessment/handbook.htm

Other teaching/learning resources:
A tool for student assessment of their learning gains
http://salgsite.org/
Bloom’s taxonomy of intellectual behavior – potential learning outcomes
http://www.officeport.com/edu/blooms.htm
A school of business that does embedded assessments
http://www.huntsman.usu.edu/cob/acct/assessment/embedded.cfm
Application of a Trait Analysis Using the Quantitative Skills Assessment Rubric (course-embedded assessment)

By
Aidong Hu
Douglas Jordan
Michael Santos

Learning Outcome for Assessment

• Students will demonstrate critical thinking skills in identifying, evaluating, and providing solutions to problems and opportunities in the business environment.
# Quantitative Skills Assessment Rubric

<table>
<thead>
<tr>
<th>Student Preparation Levels</th>
<th>Insufficient</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Types of Quantitative Skills (Bloom's Taxonomy)</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td><strong>“KNOWLEDGE”</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>“CALCULATION SKILLS”</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>“QUANTITATIVE REASONING”</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Examples of Questions Used in the Application of Quantitative Skills Rubric

<table>
<thead>
<tr>
<th>Scoring for “<strong>KNOWLEDGE</strong>” skills:</th>
<th>Scoring for “<strong>CALCULATION</strong>” skills:</th>
<th>Scoring for “<strong>QUANTITATIVE REASONING</strong>” skills:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 correct = 1, 2 correct = 2, 3 correct = 3, 4 correct = 4, 5 correct = 5.</td>
<td>1 correct = 1, 2 correct = 2, 3 correct = 3, 4 correct = 4, 5 correct = 5.</td>
<td></td>
</tr>
<tr>
<td>EXAMPLES to knowledge skills</td>
<td>EXAMPLES to Calculation Skills Using Calculators</td>
<td>EXAMPLES to Quantitative Reasoning with Words</td>
</tr>
<tr>
<td>1. The process of managing a firm’s long-term investments is called:</td>
<td>1. You have $1,000 today and want to double your money in 8 years. What interest rate must you earn?</td>
<td>1. A firm has positive net working capital and carries inventory. All else constant, the quick ratio of this firm will:</td>
</tr>
<tr>
<td>a. capital budgeting.</td>
<td>a. 9.00 percent</td>
<td>a. be equal to the current ratio, but greater than the cash ratio.</td>
</tr>
<tr>
<td>b. working capital management.</td>
<td>b. 9.05 percent</td>
<td>b. decrease when either cash or accounts receivable increase.</td>
</tr>
<tr>
<td>c. credit management.</td>
<td>c. 9.12 percent</td>
<td>c. decrease when accounts payable decreases.</td>
</tr>
<tr>
<td>d. cost accounting.</td>
<td>d. 9.25 percent</td>
<td>d. increase when inventory increases.</td>
</tr>
<tr>
<td>e. capital structure management.</td>
<td>e. 9.50 percent</td>
<td>e. always be less than the current ratio, but greater than the cash ratio.</td>
</tr>
<tr>
<td>2. Any situation where a potential conflict can arise between the firm’s owners and its managers is referred to as a(n):</td>
<td>2. How long will it take to quadruple your savings at 9 percent compounded quarterly?</td>
<td>2. Over time, the future value of $1,000 invested today at 6 percent, compounded annually, will increase by a(n):</td>
</tr>
<tr>
<td>a. organizational problem.</td>
<td>a. 8.00 years</td>
<td>a. constant annual amount given the interest on interest effect.</td>
</tr>
<tr>
<td>b. personnel conflict.</td>
<td>b. 12.50 years</td>
<td>b. constant annual amount given that interest is compounded annually.</td>
</tr>
<tr>
<td>c. agency problem.</td>
<td>c. 15.58 years</td>
<td>c. decreasing annual amount due to the compounding effect.</td>
</tr>
<tr>
<td>d. control issue.</td>
<td>d. 30.15 years</td>
<td>d. increasing annual amount given the compound interest effect.</td>
</tr>
<tr>
<td>e. compensation issue.</td>
<td>e. 62.32 years</td>
<td>e. increasing annual amount due to the effects of the simple interest rate.</td>
</tr>
</tbody>
</table>
Suppose that you’ve served on a faculty committee that has devised a list of collegewide learning objectives for your undergraduates.

You don’t want that list to just sit there on a Web site as a testimony to your college’s good intentions. (Right?) You want to take reasonable steps to measure whether your students are actually meeting the goals you’ve defined.

How best to do that is, of course, a highly contested question.

Some scholars urge colleges to use nationally normed tests, like the Collegiate Learning Assessment, that attempt to capture students’ critical-thinking and analytic-writing skills. Others say it is better to use student portfolios that allow students to demonstrate their skills in the context of their course work. (For a taste of that debate, see this post and the comments it engendered.)

Charles Blaich, director of Wabash College’s Center of Inquiry in the Liberal Arts, advocates an all-of-the-above approach. Colleges should use as many reasonable kinds of data as they can get their hands on, he says. The CLA and other national tests can be powerful tools, but they can’t possibly capture a college’s full range of learning objectives.

Mr. Blaich’s center is leading a new study in which 30 colleges and universities will try to synthesize multiple kinds of student-learning data.

“To the greatest extent possible, we want to help institutions use data that they already have,” Mr. Blaich says. “We don’t want them to have to create elaborate new structures for collecting data.”

Participating colleges will be welcome to use scores from CLA-style tests, and they will also be encouraged to dig deeply into their institutional data from the National Survey of Student Engagement and its ilk. But most of all, they will be expected to use materials from student course work.

“Each institution will have to figure out how it wants to do that,” Mr. Blaich says. “But we want them use stuff that students actually produce, and to use that information for assessment and improvement. We see this as a more sustainable model for colleges, something that turns down the temperature on data collection.”

Over a three-to-four-year timetable, each college will focus on one or two specific learning outcomes and experiment with using student-outcome data to improve classroom instruction.

“The issue we see with institutions,” Mr. Blaich says, “is actually finding processes to use the data that they have. That’s the biggest challenge. In a way, we’ve already got a lot of the assessment things down. We’ve got rubrics. We’ve got e-portfolios. We have all sorts of stuff out there. But we need to improve its yield. And that’s more of a political
Measuring Student Learning: Many Tools (2)

process, more of a cultural process.”

The 30 participating institutions have a variety of plans for their Wabash-study grants. Middlebury College and Kalamazoo College plan to use the project to assess and improve their senior-year capstone experiences.

At St. Lawrence University, faculty members plan to use the Wabash project to find ways to improve students’ quantitative literacy, writing and research skills, and appreciation of diverse cultures. They will study not only what goes on in the classroom, but also the effects of students’ visits to the university’s Quantitative Resource Center and other student-support services.

“I think one of the aspects of Wabash that fits with the philosophy of St. Lawrence is that it emphasizes the importance of pedagogy,” says R. Danielle Egan, an associate professor of gender studies who is helping coordinate the project, in an e-mail message to The Chronicle. “That is not a hard sell here. It’s central to our identity as a university.”

Ms. Egan says she understands that some faculty members “cringe (or worse)” when assessment projects arise, but she hopes that a project like this one, which is grounded in students’ course work and not tied to national tests, will win broad acceptance.

She adds that she expects the project to give students “a more transparent understanding of not only what they have been doing but why they have been doing it over their four years at SLU. I think that making learning goals transparent should help students become more intentional—or at the very least provide clarity.”

Westminster College, in Utah, will use the project to focus on some of its collegewide learning goals: “global consciousness, social responsibility, and ethical awareness.”

“That’s been the goal that we’ve wrestled with the most, as far as exactly what it entails,” says Paul K. Presson, Westminster’s associate provost for institutional research. “We’ve been trying to come up with meaningful and measurable ways of addressing consciousness and ethical awareness.”

That last comment brings us to one element of the widespread skepticism that learning-assessment projects face.

Are colleges trying to assess aspects of personal development—including student behavior outside the classroom—that really can’t or shouldn’t be measured? Is there something slightly creepy and hyperintrusive about some of this work?

“There are no chips in the neck here,” Mr. Blaich says. “I think what colleges are trying to do is to see to what extent the activities that students engage in—in terms of organizations, study abroad, and so on—to what extent are those improving things in terms of things like diversity outcomes? A liberal-arts education is meant to be a sort of seamless in-and-out-of-the-classroom environment, where all sorts of things that are going on may influence student learning. Colleges would like to get a sense of whether the activities they’re sponsoring outside of class are benefiting students as much as they hope.”
3 Tests of Student Skills Show Consistency, Study Finds
By Eric Kelderman
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The three tests used by institutions participating in the Voluntary System of Accountability are compatible in determining students’ skills in critical thinking and writing, according to the results of a study released today.

The accountability system is used by more than 300 public colleges -- all members of either the American Association of State Colleges and Universities or the Association of Public and Land-Grant Universities -- to provide the public with information about life and learning on their campuses.

As part of that system, each participating institution chooses one of three tests to administer to students in order to measure their learning from freshman to senior year. The three tests are the Collegiate Learning Assessment, sponsored by the Council for Aid to Education; the Collegiate Assessment of Academic Proficiency, from ACT Inc.; and the Measure of Academic Proficiency and Progress, offered by the Educational Testing Service.

“This study enables ... participating institutions to confidently choose one of the three tests to measure the core learning outcomes for critical thinking and written communications while ensuring comparable results,” said David Shulenberger, vice president for academic affairs at the association of land-grant universities.

Mr. Shulenberger said the study was important to validate the accountability system’s allowing three different tests -- a policy that was chosen to balance the need for comparing results with institutional autonomy.

The results may also help persuade other institutions to sign up for the accountability system, he said.

The study was conducted at 13 universities that participate in the Voluntary System of Accountability. More than 1,100 students were given 13 different tests in critical thinking, reading, mathematics, writing, and science.

The research was financed with a grant from the U.S. Department of Education’s Fund for the Improvement of Postsecondary Education.
The Collegiate Learning Assessment, a standardized test of critical thinking, can be an effective tool for changing teaching and learning in the classroom, says a report released Monday.

In a study coordinated by the Council of Independent Colleges, the test, known as the CLA, was administered to about 7,500 students by 47 small liberal-arts institutions between the fall of 2008 and the spring of 2011. The study was supported by the Teagle Foundation, and the participating colleges were all members of the council.

While the students’ actual results on the test have not been made public, council officials said the students produced CLA scores that met or exceeded expectations.

The larger goal of the study, as recounted in the report, “Catalyst for Change,” was to create a “culture of assessment” on these campuses, including finding more sophisticated ways to measure student learning, and sharing effective teaching strategies.

That goal succeeded, said the council and the foundation, which used the report to “declare victory,” as the study has come to an end. Most of the colleges will continue using the CLA on their own, according to the council.

The Collegiate Learning Assessment, sponsored by the Council for Aid to Education, is one of several tests in use by colleges in response to public demands for measures of student learning. Others include the Collegiate Assessment of Academic Proficiency, from ACT Inc., and the Measure of Academic Proficiency and Progress, offered by the Educational Testing Service.

The colleges in the council’s study used the CLA to spark changes in teaching and learning, the report says.

In response to their institutions’ CLA scores, several campuses started workshops on the pedagogy of writing and critical thinking. Others recognized weaknesses in their curriculum that were not as readily apparent before the test.

Faculty members also brought the CLA into the classroom, using the kinds of open-ended questions with no clear answers that are featured on the test as models for teaching critical thinking. These questions, called “performance tasks” on the CLA, might ask respondents to sort through news stories, ambiguous data, and a series of contradictory memos to write an essay recommending a course of action for a business where the solution could be many different paths.

Once faculty members got a closer look at the CLA, they saw that it could be a good measure of student learning, said Harold V. Hartley III, senior vice president of the council. “This is a practical way of measuring learning,” he said. “It’s a test worth teaching to.”
Private-Colleges Group Says a Standardized Test Improves Teaching and Learning (2)

Supporters of the test also say it measures the kind of critical thinking, problem-solving, writing, and analytical-reasoning skills that students are likely to need in the real world.

But skeptics say the test is too far removed from the content that students have to learn in college. And they question whether the results are truly reliable, since students never receive their scores and have little motivation to do well.

The number of students sampled at each of the colleges participating in the council’s study is also small, which means scores can vary widely based on a few results.

Despite those concerns, the report argues that self-generated efforts to adopt tests like the CLA offer a better way for colleges to respond to calls for accountability, as compared with mandates from the outside, like the measures that have been put in place at the primary and secondary levels.

If the CLA had been imposed “by external fiat,” the report says, the colleges involved might have experimented and changed less.
June 2, 2010

**Scholar Raises Doubts About the Value of a Test of Student Learning (1)**

By David Glenn


Beginning in 2011, the 331 universities that participate in the Voluntary System of Accountability will be expected to publicly report their students’ performance on one of three national tests of college-level learning.

But at least one of those three tests—the Collegiate Learning Assessment, or CLA—isn’t quite ready to be used as a tool of public accountability, a scholar suggested here on Tuesday during the annual meeting of the Association for Institutional Research.

Braden J. Hosch is director of institutional research and assessment at Central Connecticut State University, one of four institutions in that state that participate in the accountability system. He scrutinized the performance of students on the CLA at his institution over a three-year period and discovered something that made him queasy: Students’ performance on the test was strongly correlated with how long they spent taking it.

To understand why that pattern might make an assessment specialist uncomfortable, here is a brief primer on the test. In the CLA, students write essays or memoranda in response to material that they haven’t seen previously. The goal is to measure students’ skills in critical thinking, problem solving, analytical reasoning, and writing.

The CLA is one of three tests that have been endorsed by the Voluntary System of Accountability, a three-year-old effort by public, four-year universities to supply basic, comparable information on the undergraduate student experience online. Besides the CLA, which is sponsored by the Council for Aid to Education, other tests that participants in the voluntary system may use are the Collegiate Assessment of Academic Proficiency, from ACT Inc., and the Measure of Academic Proficiency and Progress, offered by the Educational Testing Service. The paper that Mr. Hosch presented here on Tuesday concerns only the CLA, and not the other two tests.

Colleges that participate in the CLA typically administer the test to approximately 100 first-year students and to approximately 100 seniors each year. If the seniors’ scores are higher than those of the first-year students, that is taken as evidence that students at that college gain fundamental skills while they are there.

The test has sometimes been criticized for relying on a cross-sectional system rather than a longitudinal model, in which the same students would be tested in their first and fourth years of college. The test’s creators say that the cross-sectional model is valid and that a longitudinal model would be severely cumbersome for most colleges, because many students transfer or take longer than four years to graduate. Several papers that defend the CLA’s framework can be found at the project’s Web site.

**Mixed Motives**

But beyond that basic question of design, there have long been concerns about just how motivated students are to perform well on the CLA. Why sit there and carefully craft an essay, after all, if there is no particular reward or punishment for your performance?
Scholar Raises Doubts About the Value of a Test of Student Learning

At Mr. Hosch’s university, freshmen are often recruited to take the test in conjunction with a “first-year experience” course that all students take. “But across the sections of that course, there’s a lot of variation in how instructors approach it,” Mr. Hosch said. “Some instructors really integrate the CLA into the course, and ask students to write reflective essays after they take the test. Others just say casually, Hey, here’s a test you can take to get five points of extra credit.”

Seniors at Central Connecticut State, meanwhile, are recruited to take the test through entirely different mechanisms. Mr. Hosch and his colleagues originally tried sending e-mail messages that appealed to students’ sense of institutional loyalty: Help us improve our curriculum and instruction, they said. But that approach yielded a grand total of zero students after six weeks. So the university instead turned to low-level bribery. Seniors who volunteer to take the test now have their $40 cap-and-gown fees waived.

With those very different motivations, will students actually take the test seriously as they sit there drafting their essays? Or, as Mr. Hosch put it, “If you’re a senior distracted by the end of the year, and your cellphone rings 20 minutes into the test, do you just pack up and walk away?”

Most cohorts of students at Central Connecticut State have apparently done well on the CLA. And one cohort—seniors who took the test in the spring of 2009—did remarkably well, with a mean score at the 98th percentile of all CLA test-takers nationwide. (That percentile figure is an “adjusted” score, taking into account the average SAT scores of Central Connecticut State students.)

Why did that cohort do so well? One answer appears to be that they spent an average of 63 minutes taking the test, up from 45 minutes for the previous year’s crop of seniors.

And why was that? Did the 2009 cohort happen to be a more motivated, conscientious bunch? Were the test items more engaging? Did the test proctor say something different that year at the beginning of the test?

The Time Factor

No one knows. But the pattern was consistent across all of the cohorts that Mr. Hosch studied: The longer the students spent on the task, the higher their average scores.

And that is what worries Mr. Hosch. The CLA is a worthy effort, he said, but it should not be used for high-stakes accountability programs until colleges get a better handle on making sure that students who take the test are representative of the entire student body and that they devote roughly equal amounts of effort to the test.

“I’m not suggesting that we give up on the CLA,” Mr. Hosch said. “I’m not suggesting that we give up on measuring student learning. But I do think we should acknowledge that test scores are related to time spent on the test, and I think we should research that further.”
Scholar Raises Doubts About the Value of a Test of Student Learning (3)

The simplest solution, Mr. Hosch said, would be to motivate students by making the CLA a truly high-stakes test—something that really mattered for their grade-point average or their graduation. But Mr. Hosch said that approach would be a serious mistake. “A high-stakes assessment is not the way we want to go,” he said.

Among other things, Mr. Hosch suggested that small groups of similar colleges should create consortia for measuring student learning. For example, five liberal-arts colleges might create a common pool of faculty members that would evaluate senior theses from all five colleges. “That wouldn’t be a national measure,” Mr. Hosch said, “but it would be much more authentic.”

‘Raising the Stakes’

In an e-mail message to The Chronicle on Tuesday, Richard Shavelson, a professor of education at Stanford University and one of the CLA’s creators, conceded that students’ motivation is related to their performance on the test.

But he added that at the institutional level, those variations in motivation tend to wash out, so that it is still valid to use the test to assess a college’s general level of learning. (Jeffrey T. Steedle, a graduate student at Stanford, presented evidence to that effect last month at the American Educational Research Association’s conference.)

“Braden is correct to point out that motivation is critical and a big concern in low-stakes testing and can affect individual students’ test scores,” Mr. Shavelson said. “The challenge confronting higher education is for institutions to address the recruitment and motivation issues if they are to get useful data. From my perspective, we need to integrate assessment into teaching and learning as part of students’ programs of study, thereby raising the stakes a bit while enhancing motivation of both students and faculty. (Incidentally, we find that some faculty do not support assessment programs and convey their feelings to students as well.)”

Richard B. Arum, a professor of sociology at New York University who has studied the CLA, said in an e-mail that he was not surprised by Mr. Hosch’s findings. And he said that he shared Mr. Hosch’s concerns about using the CLA in public accountability regimes.

“I do agree with his central point that it would not be prudent to move to an accountability system based on cross-sectional assessments of freshmen and seniors at an institution,” said Mr. Arum, who is an author, with Josipa Roksa, of Academically Adrift: Limited Learning on College Campuses, forthcoming from the University of Chicago Press.

Mr. Hosch’s paper and related materials are available at his Web site.
LITERATURE ON LEARNING AND ASSESSMENT


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