

# Liberal Education O U T C O M E S



A PRELIMINARY REPORT ON STUDENT ACHIEVEMENT IN COLLEGE



*Association  
of American  
Colleges and  
Universities*



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1818 R Street, NW, Washington, DC 20009-1604

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ISBN 0-9763576-0-7

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This publication was made possible by a grant  
from Carnegie Corporation of New York. The  
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the responsibility of the authors.

# Contents



## LIBERAL EDUCATION OUTCOMES: A PRELIMINARY REPORT ON STUDENT ACHIEVEMENT IN COLLEGE

Acknowledgments	ii
Preface	1
1. Liberal Education Outcomes: The Learning Every Student Needs	2
2. Support for Liberal Education Outcomes from Outside the Academy	3
3. Opportunities to Learn? Faculty Reports on Fostering Liberal Education Outcomes	4
4. Significant Gains? Students' Own Reports on Liberal Education Outcomes	5
5. Significant Questions: National Assessments and Studies of Liberal Education Outcomes	6
6. Convincing Evidence: Campus Assessments of Student Gains Over Time	7
7. Unfinished Business: Liberal Education and Our Students' Best Work	9
References and Notes	12

## ACKNOWLEDGMENTS

Many AAC&U staff members have contributed to this volume. We thank Gretchen Sauvey for locating many of the quotations from business and government sources, Darbi Bossman for her design and production work on earlier drafts of this publication, and Debra Humphreys and Shelley Johnson Carey for shepherding the process from early stages to final printed form. Many others have contributed through their critiques of and comments on early drafts. We thank them all for their interest and insights. We also thank the AT&T Foundation, the Christian Johnson Endeavor Foundation, and individual members of AAC&U's board of directors for their support of the Liberal Education and America's Promise initiative.

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THIS PUBLICATION WAS MADE POSSIBLE BY A GRANT FROM CARNEGIE CORPORATION OF NEW YORK.  
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# Preface



## **LIBERAL EDUCATION OUTCOMES AND STUDENT ACHIEVEMENT OF EDUCATIONAL EXCELLENCE**

This report on liberal education outcomes provides a wide-ranging and thought-provoking overview of student achievement in college. It examines a set of outcomes that are highly prized both by the academy and by employers, which include critical thinking, quantitative literacy, communication skills, ethical reasoning, and civic engagement. Drawing together research from diverse sources and studies, this report examines what we know—and how much we still need to find out—about student achievement on these and other important learning outcomes across the several years of college.

As we strive to make undergraduate education universally accessible and successful for all students, knowing how campuses are doing in achieving the most important learning outcomes is vital to the enterprise. The central finding of this report is that the most important outcomes of college study—outcomes widely regarded as key to economic opportunity and democratic citizenship—have been insufficiently addressed in reliable, cumulative assessments of students' gains from their college studies. For all the value society places on the kinds of learning addressed in this report, we still lack persuasive evidence about how well today's students are actually doing.

This report adds in two ways to the national effort to accelerate student learning and success. First, for policy leaders and campus faculty who want to provide new accountability for student achievement, the report identifies a set of learning outcomes that can frame and guide such efforts, not just in college, but from school through college. Second, the report points toward ways that campus faculty can both cultivate and assess student achievement of liberal education outcomes during the college years. While changes in assessment practices lag behind changes in our expectations for learning, we are moving toward a developed ability to document and share our successes through rich, authentic assessments.

## **LIBERAL EDUCATION AND AMERICA'S PROMISE (LEAP)**

This report has been prepared in concert with Liberal Education and America's Promise: Excellence for Everyone as a Nation Goes to College (LEAP). LEAP is a long-term effort by the Association of American Colleges and Universities to turn a spotlight on the kinds of knowledge, skills, and values that are needed to prepare today's students for an era of greater expectations in every sphere of life.

## **PROVIDING EVIDENCE**

In partnership with scholars across the country, the LEAP initiative will document national and state progress in providing every college student—whatever his or her economic background—with outcomes that characterize a high-quality education. As the tables in this report reveal, we have a long way to go before we can say how well we are actually meeting this standard. But the outcomes addressed in this study provide a strong framework through which we can chart a course and mark our progress.

Carol Schneider, President, Association of American Colleges and Universities  
Ross Miller, Director of Programs, Office of Education and Quality Initiatives, AAC&U

# Liberal Education Outcomes: The Learning Every Student Needs

The outcomes of liberal education have long been recognized as keys to success in learning, careers, and community life. Each of the liberal education outcomes addressed in this report has been widely embraced by the academic community as evidenced by written campus goals for student learning at hundreds of colleges and universities.

In 2004, a cooperative study by leaders at the nation’s institutional accreditors and by several higher education associations came to **a remarkable consensus on a few key outcomes that all students, regardless of major or academic background, should achieve during undergraduate study**. These outcomes, which were reported in *Taking Responsibility for the Quality of the Baccalaureate Degree* (AAC&U 2004), included those endorsed in AAC&U’s 2002 report, *Greater Expectations: A New Vision for Learning as a Nation Goes to College*. The recommended liberal education outcomes include:

## KNOWLEDGE of Human Culture and the Natural World:

- Science
- Social sciences
- Mathematics
- Humanities
- Arts

## INTELLECTUAL AND PRACTICAL SKILLS:

- Written and oral communication
- Inquiry, critical and creative thinking
- Quantitative literacy
- Information literacy
- Teamwork
- Integration of learning

## INDIVIDUAL AND SOCIAL RESPONSIBILITY:

- Civic responsibility and engagement
- Ethical reasoning
- Intercultural knowledge and actions
- Propensity for lifelong learning

“ [T]he only education that prepares us for change is a *liberal education*. In periods of change, narrow specialization condemns us to inflexibility—precisely what we do not need. We need the flexible intellectual tools to be problem solvers, to be able to continue learning over time. ”

— David Kearns, former CEO of Xerox Corporation

The charts that follow present evidence of broad support for the recommended liberal education outcomes and also provide a very preliminary national assessment of where higher education stands with respect to achieving these advanced learning outcomes. These data illustrate that *there is much that is not known about college student achievement*—perhaps because pointed questions about student learning have only recently been asked. Given the power that good assessments have to improve learning for all students, assessment practices should be expanded and improved on most campuses to guide parallel improvements in teaching, student effort, institutional support, and learning. Only then will we know that all of our graduates are ready to thrive and serve in a world characterized by constant change.

# 2

## Support for Liberal Education Outcomes from Outside the Academy

The chart below illustrates significant support from business and government leaders for the recommended liberal education outcomes. Given similar support for the outcomes within higher education and among accreditors, both regional and specialized (see *Taking Responsibility for the Quality of the Baccalaureate Degree*, pages 12–13), there is a strong case for conducting a campaign to engage students and the public with the importance of these outcomes.

Liberal Education Outcome: <i>Ability in or Habit of . . .</i>	Business and government support for liberal education outcome
<b>KNOWLEDGE</b> Science Social sciences Mathematics Humanities Arts	“Executives will need a broad understanding of other cultures, other languages, history, science, and the arts, if they are to successfully navigate a rapidly changing future business environment.” <sup>1</sup> <i>see also note 13</i>
<b>INTELLECTUAL AND PRACTICAL SKILLS</b> Written and oral communication	“Good writing skills and good public speaking skills are crucial to business success.” <sup>2</sup> <i>see also notes 6, 13</i>
Inquiry, critical and creative thinking	“[T]he proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially.” <sup>3</sup> <i>see also note 15</i> “We are reminded that the real challenge of today’s economy is not in making things but in producing creative ideas. . . .” <sup>4</sup> <i>see also note 18</i>
Quantitative literacy	“Business wants new employees from the educational system who can do mathematics accurately, within benchmark time periods, and frequently with the use of a calculator. . . . In the world of work it means dealing with real, unpredictable, and unorganized situations where the first task is to organize the information and only then calculate to find an answer.” <sup>5</sup> <i>see also note 13</i>
Information literacy	“Workers are expected to identify, assimilate, and integrate information from diverse sources; they prepare, maintain, and interpret quantitative and qualitative records; they convert information from one form to another. . . .” <sup>6</sup>
Teamwork	“Extracurricular activities and college projects that require teamwork can help students learn to value diversity and deal with ambiguity.” <sup>7</sup> <i>see also note 18</i>
Integration of learning	“Reading, writing, and basic arithmetic are not enough. These skills must be integrated with other kinds of competency to make them fully operational.” <sup>8</sup> <i>see also notes 6, 14</i>
<b>INDIVIDUAL AND SOCIAL RESPONSIBILITY</b> Civic responsibility and engagement	“Educating youth for citizenship should be the job of all teachers, not just those who teach history, social studies, and civics.” <sup>9</sup> <i>see also note 16</i>
Ethical reasoning	“Study of the liberal arts can lead to moral understandings that are invaluable to success in whatever one attempts in life.” <sup>10</sup> <i>see also note 17</i>
Intercultural knowledge and actions	“The improved ability to think critically, to understand issues from different points of view, and to collaborate harmoniously with co-workers from a range of cultural backgrounds all enhance a graduate’s ability to contribute to his or her company’s growth and productivity.” <sup>11</sup> <i>see also note 1</i>
Propensity for lifelong learning	“So the industry requires a workforce that can keep pace with technology—people who have the fundamental skills and an ability to continue learning . . . [T]hey will need employees that can adapt, continue to learn, and keep pace with rapid developments.” <sup>12</sup> <i>see also notes 15, 17</i>

# 3 Opportunities to Learn? Faculty Reports on Fostering Liberal Education Outcomes

If institutions and faculty do not provide opportunities for students to achieve these outcomes, the chance for high levels of student achievement are diminished. The Faculty Survey of Student Engagement (FSSE), a national survey of college faculty closely related to the National Survey of Student Engagement (NSSE), gathers data from faculty about campus learning goals and practices. Such data provides some insight into the kinds of learning being emphasized on the surveyed campuses. Analytical thinking, integration of learning, and computer use seem to gather the most uniform support. Support for outcomes in quantitative literacy as well as in individual and social responsibility is considerably lower.

Liberal Education Outcome: <i>Ability in or Habit of . . .</i>	Faculty or institutional support for the outcome (see note 19)
<b>KNOWLEDGE</b> Science Social sciences Mathematics Humanities Arts	(While FSSE asked faculty to identify the disciplinary area in which they taught, no FSSE question asked about faculty support for outcomes in specific disciplines.)
<b>INTELLECTUAL AND PRACTICAL SKILLS</b>	Percent of faculty reporting that they structure courses so that students learn and develop in the following areas “Very much” or “Quite a bit”
Written and oral communication	<ul style="list-style-type: none"> <li>• Writing clearly and effectively – 61%</li> <li>• Speaking clearly and effectively – 49%</li> </ul>
Inquiry, critical and creative thinking	• Thinking critically and analytically – 93%
Quantitative literacy	• Analyzing quantitative problems – 44%
Information literacy	Percent of faculty reporting their institutions encourage students to use computers in their academic work “Very much” or “Quite a bit” – 91% How much emphasis do you place on making judgments about the value of information, arguments, or methods such as examining how others gathered and interpreted data and assessing the soundness of conclusions? “Very much” or “Quite a bit” – 73%
Teamwork	• Working effectively with others – 55%
Integration of learning	How much emphasis do you place on synthesizing and organizing ideas, information, or experiences into new, more complex interpretations and relationships? “Very much” or “Quite a bit” – 85%
<b>INDIVIDUAL AND SOCIAL RESPONSIBILITY</b>	
Civic responsibility and engagement	How important is it to you that undergraduates at your institution do community service or volunteer work? “Important” and “Very important” – 54%
Ethical reasoning	To what extent do you structure your selected course section so that students develop a personal code of values and ethics? “Very much” or “Quite a bit” – 50% To what extent do you structure your selected course section so that students learn to understand themselves? “Very much” or “Quite a bit” – 51%
Intercultural knowledge and actions	How important is it to you that undergraduates at your institution study abroad? “Very important” or “Important” – 45% To what extent do you structure your course so that students develop an understanding of people of other racial and ethnic backgrounds? “Very much” or “Quite a bit” – 41% To what extent does your institution encourage contact among students from different economic, social and racial or ethnic backgrounds? “Very much” or “Quite a bit” – 44%
Propensity for lifelong learning	No related FSSE question.

# 4

## Significant Gains? Students' Own Reports on Liberal Education Outcomes

By questioning students about selected campus experiences during their current school year (typically as freshmen or as seniors) the National Survey of Student Engagement (NSSE) collects data on the extent to which individual campuses engage students in active forms of learning. NSSE data are useful for institutions as they reform campus programs and practices to increase engagement for all students.

Research has shown that high levels of engagement are strongly associated with improved student learning. The limitation of NSSE, however, is that it does not measure student learning directly—it collects student self-reports of learning. Large percentages of students report significant learning gains during their college years. Moreover, students report gains in all of the consensus liberal education outcomes (or in very closely associated NSSE categories). Some reported gains, however, such as those in the “civic responsibility and engagement” area, are significantly lower than might be desired.

Liberal Education Outcome: <i>Ability in or Habit of . . .</i>	Perceived gains in college learning from student self-reports—2004 NSSE Data: activity frequency OR percent of college seniors reporting how much college contributed to an outcome (see note 20)	
<b>KNOWLEDGE</b> Science Social sciences Mathematics Humanities Arts	Acquiring a broad general education: Very little – 2%, Some – 12%, Quite a bit – 37%, Very much – 49%	
<b>INTELLECTUAL AND PRACTICAL SKILLS</b> Written and oral communication	Written skills: Very little – 4%, Some – 19%, Quite a bit – 39%, Very much – 38%	Oral skills: Very little – 5%, Some – 23%, Quite a bit – 39%, Very much – 33%
Inquiry, critical and creative thinking	Thinking critically and analytically: Very little – 2%, Some – 11%, Quite a bit – 36%, Very much – 51% No data gathered for creative thinking.	
Quantitative literacy	Analyzing quantitative problems: Very little – 7%, Some – 28%, Quite a bit – 37%, Very much – 28%	
Information literacy	Using computing and information technology: Very little – 4%, Some – 20%, Quite a bit – 36%, Very much – 41%	
Teamwork	Working effectively with others: Very little – 3%, Some – 19%, Quite a bit – 39%, Very much – 39%	
Integration of learning	Put together ideas or concepts from different courses when completing assignments: Never – 4%, Sometimes – 30%, Often – 42%, Very often – 24%	Worked on a paper or project that required integrating ideas: Never – 1%, Sometimes – 12%, Often – 38%, Very often – 49%
<b>INDIVIDUAL AND SOCIAL RESPONSIBILITY</b> Civic responsibility and engagement	Contributing to the welfare of your community: Very little – 21%, Some – 34%, Quite a bit – 27%, Very much – 18%	Voting in local, state, or national elections: Very little – 47%, Some – 30%, Quite a bit – 14%, Very much – 9%
Ethical reasoning	Developing a personal code of values and ethics: Very little – 14%, Some – 27%, Quite a bit – 31%, Very much – 28%	
Intercultural knowledge and actions	Understanding people of other racial and ethnic backgrounds : Very little – 15%, Some – 33%, Quite a bit – 30%, Very much – 21%	
Propensity for lifelong learning	Learning effectively on your own: Very little – 4%, Some – 19%, Quite a bit – 40%, Very much – 37%	

# 5

## Significant Questions: National Assessments and Studies of Liberal Education Outcomes

Nationally administered tests related to some liberal education outcomes exist, but to date, there have been no comprehensive studies of the full range of important liberal education outcomes. A 1995 report of college achievement (Barton and Lapointe 1995) used data primarily from The National Adult Literacy Study of 1992, contrasting the results of college graduates with others. The data, unfortunately, indicated that significant percentages of college graduates performed at quite low levels on basic literacy tasks. Other data sources in the report included Graduate Record Exams and the synthesis of research on college outcomes compiled by Pascarella and Terenzini (1991).<sup>21</sup> While interesting, neither of these sources claimed to have data from nationwide representative samples of college students. **The chart below shows us how spotty the attention to liberal education outcomes remains in 2005. It also raises some warning signs, since the data that have been collected—in such areas as reading/critical thinking or mathematics—appear to contradict students’ own rather positive perceptions of their learning gains from college.**

Liberal Education Outcome: <i>Ability in or Habit of . . .</i>	Performance-based assessment of learning from standardized test data: performance levels and changes over time (All data from ETS & ACT are for 2003-04) <sup>22</sup>
<b>KNOWLEDGE</b> Science Social sciences Mathematics Humanities Arts	<ul style="list-style-type: none"> <li>• ETS Academic Profile data show 8% of seniors “proficient” at level 3 math, up from 5% as freshmen. (See note 23 for level 3 description.) ACT CAAP math scores show a decline from freshman to senior year.</li> <li>• ACT CAAP data for science show very small gains from freshman to senior year.</li> <li>• No proficiency data for the social sciences, humanities, sciences, or arts.</li> </ul>
<b>INTELLECTUAL AND PRACTICAL SKILLS</b> Written and oral communication	<ul style="list-style-type: none"> <li>• ETS Academic Profile data show 11% of seniors “proficient” at level 3 in writing. N.B.: The test does not actually require writing. Scores come from a multiple-choice exam.</li> <li>• No data for oral proficiency.</li> <li>• See note 24 for descriptions of writing levels of the Academic Profile. See note 25 for information about the Collegiate Learning Assessment, a new writing and thinking assessment.</li> </ul>
Inquiry, critical and creative thinking	<ul style="list-style-type: none"> <li>• ETS Academic Profile data show only 6% of seniors at “proficient” level in critical thinking, 77% “not proficient.”</li> <li>• ACT CAAP data shows less than one standard deviation gain in critical thinking from freshman to senior year.</li> <li>• No national data for creative thinking.</li> </ul>
Quantitative literacy	No national data found except as math assessment, national inferences drawn from NAEP and SAT data, and anecdotal evidence from the workplace, etc. <sup>26</sup>
Information literacy	No national data found.
Teamwork	No national data found.
Integration of learning	No national data found.
<b>INDIVIDUAL AND SOCIAL RESPONSIBILITY</b> Civic responsibility and engagement	No national data found. Related research available. <sup>27</sup>
Ethical reasoning	No national data found.
Intercultural knowledge and actions	No national data found. Related research available. <sup>28</sup>
Propensity for lifelong learning	No national data found.

# 6 Convincing Evidence: Campus Assessments of Student Gains Over Time

Whether one is interested in showing that students have achieved at a high level or that an institution “adds value,” developing and gathering evidence of student learning is required. For liberal education outcomes, evidence should vividly depict the rich and complex nature of student accomplishment as knowledge and skills are built over time and across disciplines. Since accreditors are now persistent in their demands for direct evidence of student learning related to an institution’s chosen learning goals, a system to collect and analyze the evidence should be created. Such systems will necessarily vary from campus to campus.

“Employ multiple measures, over time” and “assess to improve learning” are maxims of good assessment practice. As campus practices include more complex and challenging assignments, community placements, internships, student research, and other engaging practices, the opportunities for students to demonstrate complex capacities will be increased and distributed over several years. The same data from milestone and capstone assessments that provide evidence of student learning can contribute greatly to curricular and institutional improvement.

Promising practices encountered on dozens of campuses show the remarkable robustness of existing efforts to promote multiple outcomes of liberal learning. For example, learning communities can promote inquiry, communication skills, teamwork, or integration equally well. Assignments completed for learning communities can be assessed to show students’ level of accomplishment on each of these outcomes.

Liberal Education Outcome: <i>Ability in or Habit of . . .</i>	Instructional setting and assessment practices to generate learning and evidence of learning <sup>29</sup>
<b>KNOWLEDGE</b> Science Social sciences Mathematics Humanities Arts	Settings and practices with great potential for generating convincing evidence of student learning include: <ul style="list-style-type: none"> <li>• first-year experiences or seminars</li> <li>• research and problem-based learning, both independent and with faculty</li> <li>• collaborative projects, individual projects, “authentic” tasks</li> <li>• learning communities (topically linked courses)</li> <li>• service learning</li> <li>• internships/field placements</li> <li>• interdisciplinary study</li> <li>• significant writing and speaking opportunities</li> <li>• milestone and capstone projects and courses</li> <li>• external examiners</li> </ul> Curricular and assessment process: Careful planning of a few demanding assignments over several years can provide evidence of most or all outcomes. Assignments progress toward “graduation-level” abilities of all outcomes both for general contexts and within the major or professional area of concentration. Smaller scale assignments could cover outcomes otherwise missed. Most desirable, however, is a full integration of the learning outcomes in sophisticated, authentic tasks.
<b>INTELLECTUAL AND PRACTICAL SKILLS</b> Written and oral communication	
Inquiry, critical and creative thinking	
Quantitative literacy	
Information literacy	
Teamwork	
Integration of learning	
<b>INDIVIDUAL AND SOCIAL RESPONSIBILITY</b> Civic responsibility and engagement	
Ethical reasoning	
Intercultural knowledge and actions	
Propensity for lifelong learning	

## EFFICIENT AND USEFUL ASSESSMENTS

Lingering institutional resistance to the assessment of student learning might be reduced if the work already required in many programs, including assignments and exams, were used for more than simply generating a grade. Analysis and aggregation of class-embedded assessments can vividly demonstrate progress toward program- and institution-wide goals. It is important to note that meaningful judgments of significant achievement, regardless of field, require sophisticated expert assessment, more usefully conveyed to the learner as a narration or demonstration than as a number or grade. Such assessment can suggest ways to improve the multiple, complex outcomes of a field in ways that are similar to how experts critique and revise their own advanced work. A campus with a "culture of assessment" would not only use such feedback to assess and improve student learning, but would also teach students the critical skills and discipline-specific vocabulary needed to become proficient self-evaluators, a capacity vital for achieving at high levels.

Two decades of struggle with assessment have taught some lessons that should be honored as campuses choose and create ways to collect convincing evidence of student learning.

- Course-embedded assessments can be used for individual-, course-, program-, and institution-level assessment of student learning through appropriate analysis and aggregation. Selected assignments can be designated within major courses to serve as threshold, milestone, or capstone assessments. Such assignments can serve as assessments of both general and major-specific knowledge and skills when scored using appropriate methods and personnel.
- Individual student learning can be tracked constantly on campuses through course-level assessments, particularly if faculty learn about good formative and summative assessment practices. Administrative support for faculty development is important.
- Student development takes time so representative samples of student work, gathered at carefully chosen points in a curriculum, can be sufficient to create a program or institutional picture of student learning. Choose the sampling points after analyzing the curriculum to find points at which there is agreement that students will likely have had sufficient opportunity to learn what is being assessed.
- Given that evaluation is the highest level of the cognitive domain, students themselves should be challenged to learn assessment techniques in which they assess work in exactly the same ways used by experts in the particular domain. Not only does this raise the level of student learning, it can also provide cycles of self- and peer-formative assessment, relieving faculty of part of the formative assessment workload.

# 7

## Unfinished Business: Liberal Education and Our Students' Best Work

The basic concepts of teaching, learning, and assessment are simple, but the analysis and work involved are very difficult. To meet our society's greater expectations for liberal education outcomes, institutions need to set clear goals, establish programs and lines of responsibility for achieving the goals, teach creatively and effectively, and assess to ensure that all students are learning. Within the college or university context, a comprehensive learning and assessment framework should include several powerful elements.

1. Orientation should be provided for the student during the first year to communicate repeatedly the institution's expectations for important learning outcomes. Diagnostic assessment of each student's demonstrated accomplishment should be made and expected further progress in relation to the outcomes stated.
2. A plan of study, constructed with the student's advisor, should clearly connect the expected outcomes to the institution's required studies, the student's elective choices, and the major field(s).
3. Milestone assessments, completed as students progress in their studies in both general education and the major, should be tied to key outcomes and used to provide timely feedback to the student, his or her advisor, and programs most closely associated with the outcomes. These assessments should be aligned between two-year and four-year campuses so that successful transfers are possible; the assessments can be compiled in a portfolio that demonstrates each student's progress.
4. Capstone or culminating experiences in the major field(s) are experiences in which the student actively demonstrates and is assessed for his or her cumulative accomplishments in liberal education. The capstone or culminating experiences are critical to this framework because they provide a designated place in the regular curriculum where students do their best, most advanced work. The capstone should be conceived as both a culminating integrative experience and as the centerpiece of the effort to assess sophisticated learning. Even capstone experiences seemingly with a primary focus on major-area assessment can be assessed for multiple liberal education outcomes. Such assessments can come from "second scorings" completed inside or outside of a department or program by institution-wide teams looking for evidence of graduation-level liberal learning outcomes such as writing skill, integration, quantitative literacy, or ethical perspectives.

(Adapted from *Our Students' Best Work*, AAC&U 2004. [www.aacu.org/publications/pdfs/StudentsBestReport.pdf](http://www.aacu.org/publications/pdfs/StudentsBestReport.pdf))

## IS THERE A ROLE FOR STANDARDIZED TESTS?

Given the new emphasis on standardized testing in the schools, many observers are asking whether such testing should now become the gold standard for quality assessment in higher education. On educational grounds, AAC&U has taken a stand against the view that standardized tests are the best way to assess students' learning gains and level of accomplishment over their several years in college. AAC&U does believe, however, that standardized tests can supplement curriculum-embedded assessments when they are used with appropriate professional standards and cautions.

Why not use standardized tests of the liberal education outcomes to assess the quality of student learning in college? By its nature, a standardized test explores what all test takers know in common. But the genius of American higher education is that it helps students develop many different kinds of expertise, across hundreds of disciplinary and interdisciplinary fields. While liberal education outcomes can be described in general terms, in practice, competencies such as communication, critical inquiry, teamwork, or ethical reasoning take very different forms in different fields. Biologists use quite different inquiry methods than historians; engineers use different forms of teamwork and communication than teachers.

For these reasons, the best evidence about students' level of achievement on liberal education outcomes will come from assessment of students' authentic and complex performances in the context of their most advanced studies: research projects, community service projects, portfolios of student work, supervised internships, etc. Institutions can and should use a common framework of liberal education outcomes to report externally on students' level of accomplishment, but they should help the public understand that the standards for advanced accomplishment take different forms in different fields. **The key accountability question to ask of campuses is whether they currently expect all their students to undertake complex projects and capstone assignments that are assessed for advanced liberal education outcomes.**

With this said, standardized testing can play a useful supplementary role in the assessment of student learning. High quality pre-collegiate tests, used in concert with other evidence, can help institutions assess whether students are ready to undertake college-level work in selected areas. To the extent that standardized tests move away from the multiple-choice only format to include questions eliciting more "authentic" responses like essays and analytical narratives, they may produce insights into more complex learning. They can provide a regional or national comparison to results of local assessments, help local scorers avoid having "halo" effects creep into their process, and contribute significantly to fulfilling the "multiple measures" criterion.

# LIBERAL EDUCATION OUTCOMES—ACROSS THE CURRICULUM

## WHAT, WHEN, HOW, AND HOW DO WE KNOW?

(concepts from *Our Students' Best Work*, AAC&U 2004)

<p>What? </p> <p>When? </p>	<p><b>KNOWLEDGE OF HUMAN CULTURE &amp; THE NATURAL WORLD</b></p> <p>Science Social sciences Mathematics Humanities Arts</p>	<p><b>INTELLECTUAL &amp; PRACTICAL SKILLS</b></p> <p>Written and Oral Communication Inquiry, Critical and Creative Thinking Quantitative Literacy Information Literacy Teamwork Integration of Learning</p>	<p><b>INDIVIDUAL &amp; SOCIAL RESPONSIBILITY</b></p> <p>Civic Responsibility and Engagement Ethical Reasoning Intercultural Knowledge and Actions Propensity for Lifelong Learning</p>
<p><b>First-Year Experiences</b></p>	<p><b>How:</b> Orientation should be provided for the student during the first year about the institution's expectations for important learning outcomes</p> <p>A plan of study, constructed with the student's advisor, should clearly connect the expected outcomes to the student's choice of courses and major field(s). Learning goals, experiences, resources, and assessments should be aligned for effective learning.</p> <p><b>How do we know?</b> Diagnostic assessment of each student's demonstrated accomplishment and expected further progress in relation to these outcomes should be made.</p>		
<p><b>Focused Studies, Major/Minor(s)</b></p>	<p><b>How:</b> Plan of study continues, revised as needed</p> <p><b>How do we know?</b> Milestone assessments as students progress in their studies in both general education and the major should be tied to key outcomes with timely feedback to the student and his or her advisor. These assessments should be aligned between two-year and four-year campuses so that successful transfers are possible, and they can be compiled in a portfolio that demonstrates each student's progress.</p>		
<p><b>Advanced Integrative and Culminating work</b></p>	<p><b>How:</b> Plan of study continues, revised as needed</p> <p><b>How do we know?</b> Capstone or culminating experiences in the major field(s) are experiences in which the student actively demonstrates and is assessed for his or her cumulative accomplishments of the college career. The capstone or culminating experiences are a critical element of this framework because they provide a designated place in the regular curriculum where students do their best work. The capstone should be conceived as both a culminating integrative experience and as the centerpiece of the effort to assess sophisticated learning.</p>		

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# Notes

- Note 1:** Paul Dillon: "Executives will need a broad understanding of other cultures, other languages, history, science, and the arts, if they are to successfully navigate a rapidly changing future business environment." "What Business Expects from Higher Education," *The College Board Review* 164 (1992): 24.
- Note 2:** Paul Dillon: "Graduates entering the white-collar work force are going to have to learn how to communicate effectively, both verbally and via the written word. Good writing skills and good public speaking skills are crucial to business success." "What Business Expects from Higher Education," *The College Board Review* 164 (1992): 24.
- Note 3:** Goals 2000: Educate America Act: "Adult Literacy And Lifelong Learning. (A) By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.... (B) The objectives for this goal are that... (v) the proportion of college graduates who demonstrate an advanced ability to think critically, communicate effectively, and solve problems will increase substantially." Goals 2000: Educate America Act, HR 1804, 103<sup>rd</sup> Cong., 2<sup>nd</sup> sess. (January 24, 1994), [www.ed.gov/legislation/GOALS2000/TheAct/index.html](http://www.ed.gov/legislation/GOALS2000/TheAct/index.html).
- Note 4:** David Kearns: "We are reminded that the real challenge of today's economy is not in making things but in producing creative ideas. Today, the race goes not just to the swift, but to the inventive, the resourceful, the curious. And that is what a liberal education is all about." Introduction to *Reclaiming the Legacy: in defense of liberal education*, by Denis Doyle (The Council for Basic Education, 2000), vi.
- Note 5:** C. J. Shroll (National Coalition for Advanced Manufacturing): "Business wants new employees from the educational system who can do mathematics accurately, within benchmark time periods, and frequently with the use of a calculator.... The second important aspect of mathematics or quantitative literacy I imagine is included in the broad area of 'problem solving'.... In the world of work it means dealing with real, unpredictable, and unorganized situations where the first task is to organize the information and only then calculate to find an answer." interview. "Interviews about Quantitative Literacy" (The College Board Online, 1999), [www.stolaf.edu/other/ql/intv/html](http://www.stolaf.edu/other/ql/intv/html).
- Note 6:** U.S. Department of Labor: "Workers are expected to identify, assimilate, and integrate information from diverse sources; they prepare, maintain, and interpret quantitative and qualitative records; they convert information from one form to another and are comfortable conveying information, orally and in writing as the needs arises." Secretary's Commission on Achieving Necessary Skills (SCANS), *What Work Requires of Schools*, June 1991, 11.
- Note 7:** Business-Higher Education Forum: "Extracurricular activities and college projects that require teamwork can help students learn to value diversity and deal with ambiguity." *Spanning the Chasm: A Blueprint for Action* (Business-Higher Education Forum, 1999) 7.

- Note 8:** U.S. Department of Labor: "Reading, writing, and basic arithmetic are not enough. These skills must be integrated with other kinds of competency to make them fully operational." Secretary's Commission on Achieving Necessary Skills (SCANS), *What Work Requires of Schools*, June 1991, 9.
- Note 9:** John Glenn and Leslie Hergert: "We need to teach youth that their contributions are needed not only in times of crisis, but as a regular and ongoing part of life in a democratic country. Educating youth for citizenship should be the job of all teachers, not just those who teach history, social studies, and civics." "The civic missions of schools," In *Letters to the next president*, ed. C. Glickman, 201-206 (New York and London: Teachers College Press, 2004).
- Note 10:** Peter Fellowes, president of Fellowes manufacturing: "The study of the liberal arts, however, offers more than training in the skills of critical thinking and effective communication. Study of the liberal arts can lead to moral understandings that are invaluable to success in whatever one attempts in life." "From Books to Business: the Value of a Liberal Education," *The Chronicle of Higher Education* 49, no. 25 (February 28, 2003) B16.
- Note 11:** Business-Higher Education Forum: "The benefits that accrue to college students who are exposed to racial and ethnic diversity during their education carry over into the work environment. The improved ability to think critically, to understand issues from different points of view, and to collaborate harmoniously with co-workers from a range of cultural backgrounds all enhance a graduate's ability to contribute to his or her company's growth and productivity." *Investing in People: Developing All of America's Talent on Campus and in the Workplace* (Business-Higher Education Forum, 2002) 14.
- Note 12:** David Kearns: "So the industry requires a workforce that can keep pace with technology—people who have the fundamental skills and an ability to continue learning. . . . [T]hey will need employees that can adapt, continue to learn, and keep pace with rapid developments." Introduction to *Reclaiming the Legacy: in defense of liberal education*, by Denis Doyle (The Council for Basic Education, 2000), v.
- Note 13:** The National Association of Manufacturers: "The major areas of concern have shifted from technology skills back to the fundamentals, with basic employability skills cited as the number one deficiency. . . . Poor reading, writing, math and communication skills were also significant concerns." Jerry Jasinowski, Introduction to *The skills gap 2001: Manufacturers confront persistent skills shortages in an uncertain economy* (The National Association of Manufacturers, 2001).
- Note 14:** The National Skills Standards Board: "In a high performance work organization, academic, occupational, and employability skills are not independent of one another. It is the integration of all three that is necessary to function effectively." Mission statement.
- Note 15:** David Kearns: "We need the flexible intellectual tools to be problem solvers, to be able to continue learning over time. In such periods of change, it's not simply *what* you know that counts, but the ability to *use* what you know. In this way, knowledge is power—the ability to use specialized knowledge as you adapt to new requirements." Introduction to *Reclaiming the Legacy: in defense of liberal education*, by Denis Doyle (The Council for Basic Education, 2000) vi.
- Note 16:** Business Strengthening America: "These companies share a core belief: an increased commitment to volunteering and civic responsibility builds a stronger society and will enable businesses to 'do well by going good' because it deepens employee, consumer, and shareholder relationships." Campaign Overview, [www.bsanetwork.org/about.html](http://www.bsanetwork.org/about.html).
- Note 17:** Business-Higher Education Forum: "Methods of helping students acquire or reinforce required personal traits, including ethics, adaptability, self-management, global consciousness and a passion for life-long learning must be integrated into the core curriculum." *Spanning the Chasm: A Blueprint for Action* (Business-Higher Education Forum, 1999) 7.
- Note 18:** Roger Herman (CEO of The Herman Group): "In the years ahead we'll need more and more workers who can think, collaborate, create, solve problems, communicate, and lead. Demand will be high for people who have learned how to learn; who have strong, multidisciplinary education; and who can adapt easily to whatever comes their way." "The Case for Liberal Arts," *The Futurist* 34, no. 4 (July-August 2000): 16.
- Note 19:** Data are from the 2004 Faculty Survey of Student Engagement (FSSE) for all surveyed colleges and universities. (FSSE poses questions to college faculty to find the degree to which faculty expect students to engage in educational practices known to be linked to improved learning and personal development.) Some questions were paraphrased or created by combining stems and specific prompts. For general information see [www.indiana.edu/~nsse/fsse/index.htm](http://www.indiana.edu/~nsse/fsse/index.htm).
- Note 20:** National data for college seniors taken from question 1 and question 11 of the 2004 NSSE. Question 1 asks: "In your experience at your institution during the current school year, about how often have you done each of the following?" Question 11 asks: "To what extent has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas?" All data except for "Integration" are taken from question 11. The 2004 NSSE gathered data from 114,000 college seniors.

- Note 21:** A new edition of Pascarella and Tenenzini's massive review of the literature is now available: Pascarella, Ernest T. and Patrick T. Terenzini. 2005. *How college affects students*. San Francisco: Jossey Bass.
- Note 22:** Data for ACT CAAP tests were supplied directly to the authors from ACT. Data from Educational Testing Service (ETS) are available on-line at [www.ets.org/hea/acpro/compare.html](http://www.ets.org/hea/acpro/compare.html)
- Note 23:** At ETS level 3 for math, a student can:
- Solve word problems that would be unlikely to be solved by arithmetic; the answer choices are either algebraic expressions or are numbers that do not lend themselves to back-solving.
  - Solve problems involving difficult arithmetic concepts such as exponents and roots other than squares and square roots and percent of increase or decrease.
  - Generalize about numbers, e.g., identify the values of (x) for which an expression increases as (x) increases.
  - Solve problems requiring an understanding of the properties of integers, rational numbers, etc.
  - Interpret a graph in which the trends are to be expressed algebraically or in which one of the following is involved: exponents and roots other than squares and square roots, percent of increase or decrease.
  - Solve problems requiring insight or logical reasoning.
- Note 24:** At ETS level 3 in writing, a student can:
- Discriminate between appropriate and inappropriate use of parallelism
  - Discriminate between appropriate and inappropriate use of idiomatic language
  - Recognize redundancy
  - Discriminate between correct and incorrect constructions
  - Recognize the most effective revision of a sentence
- Note 25:** Performance data from the Collegiate Learning Assessment indicate (1) that attending college improves scores on the CLA critical thinking, analytic reasoning, and written communication tasks, and (2) that these outcomes, while strongly correlated to incoming student achievement levels, are influenced by the particular college that the student attends, with some schools doing "better than expected," an indication that there are better and worse ways to help students learn these skills.
- "We explored the 'value added' of the college experience by analyzing both within- and between-school effects. The within-school effects analysis found that, after controlling on the students' SAT scores, upperclass students (juniors and seniors) tended to earn higher scores on our measures than did underclass students. This suggests that the measures capture institutional effects (recognizing that learning occurs both in and out of the classroom). The correlation between years in school and test scores was statistically significant. A school's average score on the CLA measures also correlated highly with the school's average SAT score ( $r = 0.90$ ), yet we found statistically significant institutional effects after controlling on SAT.
- The between-school effects analysis examined whether the students at some schools were, on average, scoring higher or lower than would be expected on the basis of their mean SAT scores. Thus, the amount of education a student receives is related to the kinds of skills we assessed, and these relationships transcend the abilities tested by college entrance exams. We use this approach as a means to quantify 'value added.' (from A New Field of Dreams: The Collegiate Learning Assessment Project by Roger Benjamin, president, and Marc Chun, research scientist, both of RAND Corporation's Council for Aid to Education in *Peer Review*, Summer 2003. Available at [www.aacu.org/peerreview/pr-su03/pr-su03feature2.cfm](http://www.aacu.org/peerreview/pr-su03/pr-su03feature2.cfm))
- Note 26:** The National Assessment of Educational Progress, sometimes called "the nation's report card," periodically gathers, evaluates, and reports on nationally representative samples of student work in reading, mathematics, science, writing, U.S. history, civics, geography, and the arts. Since 1969, NAEP has studied achievement of students in grades 4, 8, and 12 according to a schedule and framework developed by the National Assessment Governing Board. For details see <http://nces.ed.gov/nationsreportcard>.
- Note 27:** The Diverse Democracy Project investigated ways that institutions prepare students for life in our diverse democracy. Project findings argue for intentional campus actions to create engaged, informed, and responsible citizens. Diversity experiences are seen as central to this learning. While suggestive of ways to advance this outcome, this project was not a national measure of the outcome. See: Hurtado, S. 2003. *Preparing college students for a diverse democracy*: Final report to the U.S. Department of Education, OERI, Field Initiated Studies Program. Ann Arbor, MI: Center for the Study of Higher and Postsecondary Education, available as a downloadable pdf at [www.umich.edu/~divdemo/index.html](http://www.umich.edu/~divdemo/index.html).
- Note 28:** The impact of intercultural experiences on student learning and development have been shown in multiple studies, many of which are summarized in Milem, Jeffrey F., Mitchell J. Chang, and Anthony Lising Antonio. 2005. *Making diversity work on campus: A research-based perspective*. Washington, DC: Association of American Colleges and Universities. Available at [www.aacu.org/inclusive\\_excellence](http://www.aacu.org/inclusive_excellence).
- Note 29:** Campus dialogues and efforts that engage faculty in campus-wide assessment initiatives are addressed in a practical guide that sketches out a framework for assessing general education outcomes. Leskes, Andrea, and Barbara Wright. 2005. *The art and science of assessing general education outcomes*. Washington, DC: Association of American Colleges and Universities.





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