Overview
The last year has seen increased attention to a national (and international\textsuperscript{1}) dialogue among politicians, professional organizations, accrediting associations, and college campuses about measuring and reporting learning outcomes. While \textit{assessment} refers to measuring learning, the national discussion focuses largely on \textit{accountability} and the need to compare institutions\textsuperscript{2}. The argument suggests consumers—parents, legislative bodies, funding agencies and the like—would be better served if these comparisons were readily available. Unfortunately, public accountability, a good thing, easily morphs into an emphasis on \textit{competition} among institutions. We are concerned that a focus on competition distracts from institutional purpose—educating our students—and discounts the fundamental reason for engaging in assessment, which is improving student learning through modifying and enhancing academic programs. Moreover, we are concerned about the limitations of standardized testing instruments being promoted for accountability because they are narrow in focus, potentially misleading, do not contribute directly to improving teaching and learning, and run the risk of becoming the sole measure of learning in an institution.

Assessment and Accountability
The ad hoc committee on assessment was charged with examining general education assessment, in order to inform faculty and promote discussion within the CU campuses. In discussions, the members found themselves returning over and over to the distinctions between assessment and accountability and the trade-offs inherent with each. Discussions in public, in the media, and even among faculty and administrators inside higher education regularly conflated the nature and purposes of assessment and accountability. Quite a bit of the heat and smoke that surrounds these discussions is dispelled once everyone recognizes the differences between assessment and accountability. In the higher education arena, assessment is the process of evaluating what students have learned. \textit{Assessment} processes provide feedback to faculty so that they may alter their teaching methods, course organization, assignments, and testing in order to strengthen student learning. \textit{Accountability} involves providing internal and, especially, external audiences with proof that students are learning what we have said they are learning, that they are mastering the skills and knowledge deemed appropriate for a college graduate. Assessment mechanisms are most often “embedded,” that is built into coursework; students are tested in class, often repeatedly and regularly, to see if they are making the progress that faculty intend. Accountability mechanisms are often external tests, with a pool of test takers from multiple institutions against whom one’s students can be compared. Accountability mechanisms include national standardized tests and licensure exams. They are not designed to assist in improving learning in a particular course, but are a snapshot of cumulative learning of a particular skill, as in a standardized commercial writing test, or of cumulative learning in a field or profession, such

\begin{footnote}
\textsuperscript{1} A Worldwide Test for Higher Education, Inside Higher Ed, September 19, 2007
\textsuperscript{2} Just this week, on a Colorado Public Radio interview, David Scaggs, Executive Director of CDHE, opined that Colorado institutions of higher education should be ranked via a common test to better distinguish among them.
\end{footnote}
as teacher or nursing licensure or the bar examination for law. Institutions can pursue either assessment or accountability or can undertake both.

**What is the current state of assessment at CU?**

Each campus and college has significant assessment practices in place. In the past ten to twenty years, in part due to the prodding of national accrediting bodies and professional program accreditors, academic units have developed explicit assessment processes, focusing on the major (English, Psychology, Chemistry, etc) or professional degree program (Nursing, Business, etc). In the early years, institutions struggled to develop robust accreditation measures and to embed them in coursework, to make them really integral to the teaching and learning process. Eventually, as best practices were developed and shared, institutions came to understand the assessment process and to value it for its own sake and not just undertake it to satisfy accrediting bodies.

To date, most efforts at CU have focused on assessing learning in the major and on what graduating seniors know, rather than on the general education lower division curriculum. However, UCCS has taken the lead by developing significant general education portfolio-style assessment, with direct measures of student writing.

At CU, the learning objectives and skills expected to graduate in each program have been delineated and academic units have developed senior seminars, capstone courses, portfolios and more to assess student learning. Grades in individual courses are not deemed adequate assessment measures by accreditors; a more comprehensive review of student learning is required. A crucial part of assessment is the feedback loop, in which faculty review graduating seniors’ performance and compare them against departmental learning expectations. Revisions to curriculum and course requirements to remedy the gaps and weaknesses that are revealed are essential elements of the assessment process.

CU campuses all meet or exceed the assessment requirements of the Higher Learning Commission of the North Central accreditation body, which accredits CU’s undergraduate programs. But no campus at CU is resting on its assessment laurels. Efforts are underway at all three institutions to improve the assessment process. At Denver, for example, the Core Curriculum Oversight Committee has launched a review of all core courses to see if they are meeting their stated objectives. At Boulder, the Arts and Sciences core review committee is examining whether the courses still meet the goals that were stated when these courses were originally created. Boulder is interested in the assessment of critical thinking that has been developed by the National Science Foundation. (Please see Appendix C for a discussion of this instrument.) At Colorado Springs, some departments have decided to move beyond assessment of summative learning goals for graduates to course-level assessments of individual skills and knowledge goals in hopes of identifying, in finer detail, data for program enhancement. UCCS is exploring options for disseminating general education portfolio data to faculty at the unit level.

**What is the current state of accountability at CU?**

CU, like all other public colleges and universities in Colorado, has a Performance Contract with the state, through its agent the Colorado Commission on Higher Education. Meeting the goals of
the contract is necessary to continued status as an “enterprise” eligible to receive the state’s subsidy for student education. This contract requires annual reporting, but CCHE does not undertake its final analysis of whether we have met our Performance Contract goals until 2010.

The Performance Contract is by no means the first state effort to obtain accountability measures from public higher education. Prior to the Performance Contract, CU and other institutions were required by CCHE to report annually on a series of measures called Quality Indicators. And before the Quality Indicator System, CCHE had collected various annual and one-time reports on aspects of institutional performance, mostly focused on retention and graduation rates, transfer, administrative efficiency and affordability. Sometimes hot button issues were incorporated into accountability measures; for example, to meet the perceived lack of access for rural students, measures were created to track the development of distance education offerings and, to meet the perceived lack of job training, measures were developed to track creation of new degrees in areas of special economic need in the state, such as technology training and special education.

What is Available Today and Who Might Use It and Why?
Numerous groups are engaged in developing accountability measures. The National Association for State Colleges and Land Grant Universities (NASULGC) and the American Association of State Colleges and Universities (AASCU) have jointly developed a Voluntary System of Accountability (VSA) and the American Association of Universities (AAU) is considering the development of its own version of voluntary accountability. In addition, the National Science Foundation has developed an assessment of critical thinking skills. (See Appendix C). There may soon be a range of new accountability tools from which to choose. The Fund for the Improvement of Secondary Education (FIPSE) has funded a multi-institutional study of standardized commercial tests as well as measuring curriculum-embedded assessments, such as course and program based portfolios.

There are a variety of commercially developed standardized tests for various aspects of general education learning, including the Collegiate Learning Assessment (CLA), Measure of Academic Proficiency and Progress (MAPP), and Collegiate Assessment of Academic Proficiency (CAPP).

The committee reviewed the rationale for such testing, evaluated three of the published instruments and described the goals of general education on the three CU institutions. Members of the committee raised concerns about the limitations and problems with a reliance on standardized scores as a measure of learning. At the same time, the committee recognizes the need to measure our students’ learning accurately and acknowledges the momentum from policy makers and politicians to require standardized tests and the need for CU to respond proactively.

Briefly, the rationale for using commercial standardized measures of learning outcomes are that they:
• Provide standardized measure of the value-added by an institution.
• Provide standardized comparisons across institutions.
• Help meet accreditation requirements
• May document program improvement and effectiveness over time.
The concerns raised about reliance on commercial standardized tests are that they:
- Potentially allow testing companies, rather than faculty, to set college curriculum (teaching-to-the-test phenomenon).
- Provide limited content coverage in a few general areas of learning.
- Do not take disciplinary differences into account.
- Provide little information that would be useful for improving teaching and learning.
- Focus on the test could direct instructional attention away from areas not tested.
- Scores could be used to “punish” low-performing colleges rather than provide information for program improvement.
- Large number of transfer students makes comparisons of academic growth over the four years difficult and institutional comparisons flawed.
- Students may have little to no motivation to perform well.
- They fail to recognize that some educational benefits manifest themselves after students have left universities (in job environments, future schooling, etc.). They cannot capture subsequent performance.

While resolving the tension between accountability and program improvement was not the committee’s purpose, it seems clear that campus-wide discussions of these issues are necessary if we are to meet external demands for accountability while maintaining curricular integrity.

**Rationale for Testing**

Clearly, each CU institution already engages in many forms of assessment. All three participate in the respected National Survey of Student Engagement (NSSE), regularly survey student employers, conduct student exit surveys, and track student performance on professional exams. While employer surveys, exit surveys and professional exam results may be indicators of student learning, the focus of these assessments is on the major, not on general education.

It is important to describe why CU should or would elect to measure student learning beyond what is currently being done. Several questions guided the committee’s thinking:
- What is the value added of undertaking such assessments, commercial and/or in-house)?
- Is the purpose program improvement?
- Is the purpose transparency and accountability to the public, students and parents and does the assessment tool provide this service?

The table below summarizes the committee’s thoughts on these questions. First, the table looks at the assessment of general education writ large. Then four specific policy choices are presented, representing the four possible combinations of choices on two key dimensions that seem to organize the alternatives CU institutions should consider. The first dimension addresses whether assessment results will be made public or kept internal to the university, i.e. will it be used for comparisons to other institutions or be used internally to guide changes in curriculum? Second, will Boulder, Colorado Springs and Denver use a standardized instrument or create their own?

<table>
<thead>
<tr>
<th>Policy Alternatives</th>
<th>Favoring testing</th>
<th>Cautions about testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall: Assessment</td>
<td>*is required for accreditation</td>
<td>*may lead to a lessoning of value for</td>
</tr>
</tbody>
</table>
### of general education

- for some units
- *may help evaluate success in reaching basic educational goals*

### Standards of education

- the major and other aspects of the college experience
- *results may be distorted by discipline differences*
- *may have little meaning if gen ed is integrated into disciplinary programs*
- *may create pressure for a common gen ed approach that undermines the unique roles and missions of the campuses; may inhibit innovations*
- *may be weighted toward pedestrian, easily measured (but not necessarily most important) aspects of the goals*
- *student motivation may be suspect*
- *will cost money and effort*

### Standardized test, results, externally published

- *provides public accountability*
- *allows comparison with other institutions with regard to basic goals*
- *institutional motivation to do well*
- *may promote “gaming” of assessment*
- *may play into simplistic comparisons of institutions*
- *may distract from important goals not captured by the standardized tests*
- *cost of instrument*

### Custom assessment, results, externally published

- *assessment can be keyed to specific program features*
- *institutional motivation to do well*
- *can lead to changes in general curriculum*
- *may lead to changes in other institutions*
- *may not permit comparison of institutions*
- *may provide weak public accountability*
- *effort and cost required to develop*

### Standardized test, results, internal use

- *allows (limited) comparison with other institutions*
- *avoids “gaming” of assessment*
- *does not provide public accountability, though some results could be shared with the public*
- *cost*

### Custom assessment, results, internal use

- *avoids “gaming” of assessment*
- *motivation to do well when results are used for program improvement*
- *does not provide public accountability*
- *does not permit comparison with other institutions*
- *effort and cost to develop*

Consideration of these policy alternatives should inform a decision about what form of assessment, if any, to recommend, and what the rationale for that recommendation would be. The committee has not attempted to reach a consensus on a recommendation, presuming that to be a matter for each institution to decide.

### Overview and Comparison of Three Standardized Assessments

As accountability tools, the standardized assessments provide limited information about student performance in a few relevant general areas (e.g., critical thinking, analytical reasoning, written communication), but they offer little specific feedback to faculty or students about the performance of students in their program areas or about how to improve teaching and learning.
The main benefit is that the results can be compared with those of other institutions. Given their
decontextualized design, they offer less authentic accounts of student’ learning competencies.

Benefits and costs of the three most popular standardized measures of undergraduate learning
(CLA, MAPP, CAAP) are summarized below. (For a more extensive discussion of these and
other measures see the 2007 ETS publication “A Culture of Evidence: Critical Features of
Assessments for Postsecondary Student Learning.”)

- The Collegiate Learning Assessment (CLA) by CAE/Rand is an essay test that measures
  reasoning and written communication. It costs approximately $6,300 for scores for 100
  freshmen and 100 seniors per year and an institutional score report.
- The Measure of Academic Proficiency and Progress (MAPP) by ETS is a multiple choice
  format that measures reading, writing, critical thinking, mathematics, humanities, social
  sciences, and natural sciences. Cost is approximately $3,100 for 100 freshmen & 100
  seniors.
- The Collegiate Assessment of Academic Proficiency (CAAP) by ACT offers six
  independent test modules made up of multiple choice and essay formats that measure
  reading, writing, science, mathematics, and critical thinking. Cost is approximately
  $3,700 for 100 freshmen and 100 seniors.

In general, the arguments in favor of standardized measures are that there is a dearth of empirical
evidence regarding the learning that takes place in higher education. Arguments against the use
of standardized measures are that they might be used in a “one size fits all” way and become the
sole measure of student learning on the institutional level. More specifically, potential costs and
benefits are described below.

Potential Benefits:
- Provides standardized measure of the value-added by an institution.
- Provides standardized comparisons across institutions.
- Helps meet accreditation requirements.
- May document program improvement and effectiveness over time.
- May identify curricular strengths and weaknesses.

Potential Costs or Problems:
- Potentially allows testing companies rather than faculty to write goals and define outcomes of
  instruction across CU, in essence shifting control of the curriculum to external entities with
  no direct knowledge of CU student academic needs.
- Provides limited content coverage in a few general areas of learning.
- Provides little information that would be useful for guiding teaching and learning.
- May direct instructional attention away from academic areas not tested
- Scores could be used to “punish” low-performing colleges rather than provide information for
  program improvement.
- Large number of transfer students makes academic growth comparisons over the four years
difficult and institutional comparisons flawed.
- Significant threat to the validity of the test results is that students may have little to no
  motivation to perform well on the tests since individual scores are not reported and there are
  no consequences to students for their performance, as there would be if the tests were
  embedded in the gen ed course work.
- Fails to capture developmentally delayed gains in learning, which manifest across time and space (in job environments, future schooling, etc.).
- Standardized testing is often inaccessible to those with disabilities and poses risks for minority students whose cultural competencies may not be captured by mainstream assessment instruments.
- The test will impose an unfunded expense on the university.

<table>
<thead>
<tr>
<th>Test</th>
<th>Outcomes MEASURED</th>
<th>Format</th>
<th>Annual Cost</th>
<th>Some Specific Strengths</th>
<th>Some Specific Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collegiate Learning Assessment (CLA) by CAE/Rand</td>
<td>Written Communication Analytical Reasoning Critical Thinking</td>
<td>Essay (Performance Tasks &amp; Writing Prompts)</td>
<td>$6,300 (scores for 100 freshmen &amp; 100 seniors)</td>
<td>--performance task focus</td>
<td>--ninety minutes for the performance task and 75 minutes for the writing prompt may not provide sufficient assessment information picture</td>
</tr>
<tr>
<td>Measure of Academic Proficiency &amp; Progress (MAPP) by ETS</td>
<td>Reading Writing Critical Thinking Mathematics Humanities Social Sciences Natural Sciences</td>
<td>Multiple Choice (essay supplement in development)</td>
<td>$3,100 (per 100 Freshmen &amp; 100 Seniors at $15.50 per test)</td>
<td>--less expensive than CLA</td>
<td>--multiple choice format; two hours total for test; assesses editing skills at sentence, not whole text, level</td>
</tr>
<tr>
<td>Collegiate Assessment of Academic Proficiency (CAAP) by ACT</td>
<td>Reading Writing Mathematics Science Critical Thinking</td>
<td>Six independent test modules of 40 minutes each, essay &amp; multiple choice</td>
<td>$3,710 (scores for 100 freshmen and 100 seniors at $18.55 per test)</td>
<td>--less expensive than CLA</td>
<td>--multiple choice format; number of items may not be sufficient for accurate picture, only 40 min. test per area; writing portion is two twenty minute essays</td>
</tr>
</tbody>
</table>
As part of the university’s accreditation by the Higher Learning Commission of the North Central Association, all programs in the university are expected to put into place an outcomes assessment system in which programs use assessment of student learning data to guide their program improvement process. Within this outcomes assessment process, programs are expected to design and administer course-embedded and program-driven assessments of their students’ learning. Regardless of the decision about using externally-developed standardized assessments, the university would be well served to strengthen its present program-based outcomes assessment process, drawing on best practices to define effective measures. If transparency and letting our various constituents know how well our students perform are important, we could develop our own college-wide assessments of key general education outcomes, such as critical thinking or written communication. These results could be widely disseminated.

Existing Models of General Education Within CU
This section highlights the approaches to general education at each of the three universities that comprise the University of Colorado. It is essential to understand the different ways in which general education is realized across the campuses because the cumulative measures of student learning being considered in the national conversation about accountability are usually associated with the portion of the typical undergraduate curriculum categorized as general education in most contexts. The differences explicated below suggest that the commercially available tests of student learning are inadequate to measure the full range of learning intended to take place across the three universities. (See Appendix A for the general education requirements of all three institutions.) Successful assessment may combine direct and indirect and qualitative and quantitative measures

UCCS
UCCS adopted the following campus goals for undergraduate general education in May, 2000:

The overarching purpose of general education is to cultivate students' intellectual, personal and ethical development and thus equip them to be life-long learners, able to adapt to an ever-changing environment. More specifically,

1) Students will be able to read, write, listen and speak in a manner that demonstrates critical, analytical and creative thought.
2) Students will achieve a depth of understanding in their majors and a breadth of experience in other fields.
3) Students will understand and apply the tools and methodologies used to obtain knowledge.
4) Students will be prepared to participate as responsible members of a pluralistic society - locally, nationally and globally.

Each college subsequently reviewed its general education requirements and revised them as was deemed necessary to facilitate students reaching these goals. The College of Letters, Arts and Sciences and the three professional schools with separate undergraduate programs have established their own general education requirements, which are intended to address the campus goals as well as, in the case of professional schools, their own accreditation standards

UCCS Assessment Related to General Education
Once the general education goals were established and approved in 2000, it became the task of the Student Achievement Assessment Committee (SAAC) to propose a set of related assessment activities. General education assessment planning began in AY 2001-02. That year, UCCS developed a baseline database of student performance measures tied to each of the core goals of the program. A general education assessment proposal was presented to the Educational Policy and University Standards Committee (EPUS) of the Faculty Assembly in fall 2002. After several drafts and discussions, EPUS recommended approval to the Faculty Assembly, which occurred on May 9, 2003.

The instruments identified in the proposal to assess general education include:

- The ETS Measure of Academic Proficiency & Progress (formerly the Academic Profile) a qualitative measure, snapshot assessment of a limited subset of students, measures decontextualized skill and content.
- The National Survey of Student Engagement (NSSE) a qualitative, affective measure
- The Writing Portfolio, a direct measure of all undergraduates’ writing competencies, quantitative measure with formative and summative functions.
- The Graduating Seniors Survey, student self-assessment of college learning
- The Baccalaureate Alumni Survey, graduate’s self-assessment of college learning from the perspective of being out in the work place.

Once the general education assessment plan was established and approved, it became the task of the Student Achievement Assessment Committee (SAAC) to regularly collect the data needed to assess the core goals. SAAC is also responsible for submitting campus reports to EPUS and the Vice Chancellor of Academic Affairs (VCAA) on the overall state of general education on the campus, characterizing the degree of achievement of the general education goals at the campus and college levels. College responses regarding student achievement of the core goals were submitted, in summary form, to EPUS in 2005. If SAAC finds that a college’s response does not adequately address general education concerns, SAAC may include additional recommendations for that college in the final report to EPUS and the VCAA. The SAAC report may also include recommendations for actions at the campus level.

EPUS is charged with evaluating the findings of the report to determine if the campus and the individual colleges are appropriately implementing the general education goals adopted by the faculty. EPUS then reports and makes recommendations to the Faculty Assembly. UCCS is in the process of completing its second cycle of assessment of general education.

UCD

Philosophy of the Core:
The Core Curriculum of the Downtown Denver Campus provides all UCD undergraduate students a high quality general education based on a liberal arts foundation while allowing students flexibility based on their individual backgrounds and specific career goals. The Core Curriculum develops multiple literacies, stimulates creative thinking, and utilizes technology. A
goal of the UCD Core Curriculum is to engage students in developing sensitivity to diversity and developing their place in an urban environment as well as in the rapidly changing global environment.

General Policies:
1. Once an undergraduate student matriculates at UCDHSC, all courses applied to the UCD Core Curriculum are to be from the list of approved courses as established by the Core Curriculum Oversight Committee.

2. Specific core courses may be identified by a college or program to satisfy requirements in the student’s major.

Courses approved for the UCD Core Curriculum must be reviewed and approved by the Core Curriculum Oversight Committee (CCOC) which is a faculty governance committee with representation from each school/college offering undergraduate degrees on the downtown Denver campus. As required by the CCHE-CU Performance Contract, all lower division courses approved for the UCD Core Curriculum are also submitted to the Colorado Commission on Higher Education (CCHE) for review and approval in the gtPathways program of guaranteed transfer of general education course work.

UCD Core Curriculum Learning Objectives
The following learning objectives were developed by the faculty in the Core Curriculum Oversight Committee are:
- develop basic literacy in quantitative reasoning and English composition
- stimulate and develop critical thinking
- develop a skill set for life-long discovery
- develop sensitivity to diversity
- develop broad knowledge and creativity for an internationalized 21st century

The faculty also developed learning objectives for each knowledge areas of the UCDHSC Core. (Please see Appendix A.)

Core Curriculum Assessment
In general, the assessment of core curriculum at UCD is currently left to the individual departments and instructors. The CCOC requires the syllabus for a core curriculum course to have explicit learning objectives and to utilize standard assessment techniques. However, there is currently no oversight or enforcement of the CCOC requirements. In collaboration with the Core Curriculum Oversight Committee, John Lanning (Undergraduate Experiences) and Kenny Wolf (Assessment Office) have been charged with developing a detailed assessment plan for the UCD Core Curriculum. This plan will include current assessment measures:
- The National Survey of Student Engagement (NSSE)
- The Graduating Seniors Survey
- The Baccalaureate Alumni Survey
**UCB**

**What is meant by ‘General Education’ in the context of a baccalaureate degree at the University of Colorado at Boulder?**

The ‘classical’ view of general education very roughly postulates that most students who wish to earn a baccalaureate degree should have a common set of courses that form the skills and knowledge foundations upon which they can then develop deeper understandings and higher skill levels in their major area of concentration. This model generally views the first four semesters of students’ college experience as necessarily including a relatively homogenous set of ‘general education’ courses such as mathematics, critical thinking, and English composition that stand relatively independent of any specific discipline or major. This view of ‘general education’ is implemented by community college systems for students who are anticipating transfer to a four year institution to complete a baccalaureate degree. And UCB accommodates this type of gen ed course because of the mandatory transfer requirements of the state and CCHE (via the GT Pathways).

The vertically integrated, discipline-specific approach—used at UC Boulder--to an undergraduate degree employs a significantly different structural model. (See Appendix A for requirements.) In brief, this model does not frame the curriculum for baccalaureate degrees as composed of a ‘general education’ part and a ‘depth in a discipline’ part. Rather, this approach recognizes, employs, and honors, the great heterogeneity and distinctiveness found among different majors. This vertical (meaning across years) model generally does not recognize ‘general education’ as a separate, distinguishable, educational framework upon which to structure undergraduate experiences. Rather, this model rests upon the premise that most students learn the skills and techniques best—even those often identified with a general education category—when they are taught principally within the supporting context of the discipline. This model can be clearly discerned in the popular strategy called ‘writing in the disciplines’ wherein writing is taught with focused class topics, strategies, methods, and techniques using the vocabulary, the critical thinking frameworks, and the subject matter of particular disciplines. A writing class taught in the Ecology and Evolutionary Biology department would, in many important ways, be rather different from a writing class taught in the Leeds School of Business or that taught in a class in American Literature. The vertical integration model can also be seen in CU-Boulder’s formal requirement for an upper division writing class, distinguishing it from, say, a traditional program of two semesters of English composition taken during the first year at college.

A second major departure from the traditional ‘first two years as general education’ model at CU-Boulder is the ‘critical thinking’ requirement: these are all upper division courses normally taken during the 3rd and 4th years on campus; many of these have lower division prerequisites.

A third major departure from the traditional model is easily seen below in the College of Engineering ‘General Education’ mandated transfer curriculum, the only place the words ‘general education’ appear in degree requirement specifications in CU-Boulder’s catalog. That view of ‘general education’ includes 17 hours of mathematics, 8 hours of physics, 6 hours of economics and 3 of world history. This delineation of what ‘general education’ means within the College of Engineering serves as a powerful illustration of the importance of disciplinary...
context. Students in the Arts and Sciences College fulfill a quite different set of general education requirements. (Please see Appendix A.)

Given these rather different models of undergraduate education, the issues of a common testing instrument or testing strategy to produce a truly meaningful, useful aggregate measure for an entire campus are very difficult. Bad data can be more harmful than no data.

**UCB Assessment Related to General Education**

Academic assessment on the Boulder campus reflects these principles: (1) assessment should be sustained as a regular, necessary and integrative element in successful unit (mostly departments) operations; (2) goals and methods of assessment are best defined and implemented by the units themselves, not at higher levels of organization (e.g., at the Dean's level or campus level or system level) although the requirements of accrediting bodies must be met; (3) assessment results should be academically focused and embedded (in order to ensure high student effort) and they should emphasize academic goals without relying primarily on student surveys, which are impressionistic; (4) the analysis and interpretation of assessment results should be clearly connected and influential with respect to changes or modifications in unit operations such as establishment of needed new courses, changes in emphasis of established courses, organizing the distributional expertise of faculty via new faculty hires, revision of graduation requirements, etc.; and (5) the quality and effectiveness of assessment processes at the unit level should be critiqued and evaluated regularly via the Program Review Process and by the Assessment Oversight Committee.

The campus devotes a substantial amount of resources, especially time, on academic assessment and, in many cases (not all), such effort has produced significant change in unit operations. Methods range from commercial exams, to juried performances by outside jury members, to exchange of student essays with similar departments in other universities, to before and after testing within courses, to professional licensing exams, graduate record exams, law school admission tests, medical college admission tests and more. Please see Appendix B “Observations of the CU Boulder Assessment Oversight Committee Regarding Assessment & Accountability” for a more detailed investigation of the relation between the UCB curriculum and commercial accountability instruments.)

**Summary and Recommendations**

The previous section makes evident the very large differences across the three universities in this single state system in the general education curriculum and its assessment. Both UCB and UCCS have different requirements in different colleges. Both UCCS and UCD rely on campus-wide frameworks to shape general education, UCCS through a common set of goals, and UCD through common goals and categories of requirements. Boulder’s vertical integration model, in particular, calls into question the premise that a set of generic outcomes should be measured independently of the more particular outcomes identified in each major. In a different way, UCCS’ and UCD’s particular goals suggest that even in the portion of the curriculum identified as general education, not all of the goals are likely to be adequately reflected in any single test or measure. Do any of the tests, for example, even indirectly address aesthetic appreciation (UCD)
or responsible citizenship (UCCS)? Further, all three universities are already grappling, in the way that most suits each institution, with the assessment of student learning associated with general education. What might be the impact on those embedded assessments of super-imposing a one-size-fits-all accountability measure? At a minimum, this examination of current practices does not appear to suggest any clear or straight-forward answer to the questions this report is designed to address. However, the committee recognizes that there is significant interest in accountability, which is usually understood by the public to mean standardized testing.

What should CU do?
There are four possible answers to this question. First, we could continue the modest assessment and accountability activities that we are currently doing. Second, we could create accountability measures of the general education core (writing, mathematics, analytical reasoning) based on commercial testing instruments, such as those recommended by the VSA. Third, we could undertake an assessment initiative (perhaps funded by the President and Chancellors) to develop or improve embedded testing to enhance assessment. Fourth, we could try to take on both assessment and accountability imperatives both by participating in accountability via commercially available standardized testing and by developing embedded assessments designed around the specifics of each CU institution’s general education curriculum.

Recommendation
The ad hoc committee on assessment recommends:
(1) that each CU institution take up the conversation about assessment and accountability that this report has begun. We believe CU institutions are ready to review the current state of their general education assessment processes, examine best practices, considering a rich mix of measurement tools (formative and summative, qualitative and quantitative) and to enhance them.

(2) Because each institution has a somewhat different role and mission and different student populations, each should develop an explicit plan to evaluate its assessment and accountability measures vis a vis general education. The process of evaluation should begin in the Spring semester and be concluded by the following Fall semester.

(3) Once evaluations are complete, each institution should decide what additional programs and actions, if any, would be needed to achieve robust assessment and accountability and then implement them.

(4) After implementation, there should be periodic serious reviews that ask: Have assessment processes changed as a result of feedback and have the resulting changes to courses and instruction led to improved student learning? Have accountability measures served to inform the public about the quality of the undergraduate CU experience and have they enhanced CU’s credibility? Change and improvement can then be documented over time.

Appendix A
Core requirement for each institution
CU-Boulder Core Requirements for Each School and College

Here is a brief, necessarily incomplete summary of what constitutes undergraduate ‘core requirements’ on the Boulder campus.

Engineering

There are multiple majors within the College of Engineering and Applied Sciences and the requirements vary considerably among those major departments. For illustrative purposes, we here provide the current requirements for Aerospace Engineering which, from the General Education perspective of this report, serve as a reasonable exemplar for the whole college, keeping in mind there are substantial variations. We note the vertical integration with a strong adherence to specific order and sequences from one semester to the next.

The BS curriculum in aerospace engineering sciences is revised annually to keep up with new advances in technology, to make use of new educational methodologies, and to satisfy updated program accreditation criteria. The following curriculum requirements are those in effect at the time this catalog was printed.

Required Courses Semester Hours

Freshman Year

Fall Semester
APPM 1350 Calculus 1 for Engineers 4
CHEM 1221 General Chemistry Lab for Engineers 2
CHEN 1211 Engineering General Chemistry 3
GEEN 1400 Engineering Projects 3
Humanities or social science elective 3

Spring Semester
APPM 1360 Calculus 2 for Engineers 4
PHYS 1110 General Physics 1 4
Computing requirement (GEEN 1300 or equivalent) 3
Humanities or social science elective 3

Sophomore Year

Fall Semester
APPM 2360 Introduction to Differential Equations with Linear Algebra 4
### ASEN 2001 Aerospace 1: Introduction to Statistics, Structures, and Materials 5

### ASEN 2002 Aerospace 2: Introduction to Thermodynamics and Aerodynamics 5

Humanities or social science elective 3

### Spring Semester

APEM 2350 Calculus 3 for Engineers 4

### Junior Year

#### Fall Semester

ASEN 3111 Aerodynamics 4

ASEN 3112 Structures 4

ASEN 3113 Thermodynamics and Heat Transfer 4

PHYS 1120 General Physics 2 4

#### Spring Semester

ASEN 3128 Aircraft Dynamics 4

ASEN 3200 Orbital Mechanics/Attitude Determination and Control 4

ASEN 3300 Electronics and Communications 4

WRTG 3030 Writing on Science and Society 3

Humanities or social science elective 3

### Senior Year

#### Fall Semester

ASEN 4012 Aerospace Materials 3

ASEN 4018 Senior Projects 1: Design Synthesis 4

Free elective 3

Professional area electives 6

#### Spring Semester
ASEN 4013 Foundations of Propulsion 3
ASEN 4028 Senior Projects 2: Design Practicum
Free elective 2
Professional area elective 6

Leeds School of Business

Math, 6 hours, one each from two specified lists
Written Communication, 6 hours, 3 lower and 3 upper division required
Historical context, upper or lower division
Cultural and Gender Diversity, upper or lower division
U.S. Context, upper or lower division
Literature and Arts, 3 lower and 3 upper division required
Natural Science, 6 hours, upper or lower division, no specific requirements
Contemporary Societies, Micro- and Macro- Economics only
Ideals and Values, upper or lower division

Arts and Sciences

Foreign Language, third level (third college semester) proficiency
Quantitative Reasoning and Mathematical Skills—3-6 hours, lower division
Written Communication, 6 hours, 3 lower, and 3 upper required
Critical Thinking, 3 hours, Upper division only
Historical Context, 3 hours, upper or lower division
Cultural and Gender Diversity, 3 hours, upper or lower division
U.S. Context, 3 hours, upper or lower division
Literature and the Arts, 6 hours, 3 lower and 3 upper required
Natural Science, 13 hours, upper and lower, two course sequence, laboratory or field required
Contemporary Societies, 3 hours, upper or lower division
Ideals and Values, 3 hours, upper or lower division

College of Music

English Composition, 3 hours
Foreign Language, third level (third college semester) proficiency
Thirty four hours from the A&S Core curriculum

School of Journalism and Mass Communication

Same as for Arts and Sciences except no Critical Thinking course requirement

College of Architecture and Planning

Written Communication, 3 hours, lower or upper division
Mathematics, 3 hours from specified list, upper or lower division
Science, 1 course from specified list, lower division
Social Science, 1 course from list, lower division
Humanities, 1 course from list, lower division
**UCCS Requirements**

**College of Letters, Arts and Sciences**
The college requires all students to complete an English writing requirement, a reasoning proficiency requirement, area requirements, and cultural diversity, oral communications, and global awareness requirements. Assuming that a student does not test out of the writing and reasoning requirements, the total number of credit hours needed to complete the college general education requirements is 45.

The College of Letters, Arts, and Sciences will accept transfer courses from the community college "general education core" and substitute these credits for credits required within the 120 hours needed for the BA or BS degree in whatever manner is most advantageous to the student. The College will also accept non-core academic courses in transfer, i.e., courses that are not considered to be vocational or technical in nature.

**English Composition and Writing Competency Requirements**

To qualify for a bachelor's degree from the College of Letters, Arts, and Sciences, a student must complete Rhetoric and Writing course requirements and demonstrate writing competency by successfully passing the writing portfolio assessment. There are four different ways in which students may meet these requirements, described as follows:

1. Successfully complete ENGL 131 and 141 at UCCS and then pass the portfolio assessment.

To demonstrate writing competency after course completion, students must pass the **writing portfolio assessment** administered by the writing program. Students who choose not to demonstrate competency by earning a pass on their writing portfolio may meet the competency requirement by successfully completing a 300-level, advanced composition course at UCCS with a C- or better, a course beyond those stipulated within their degree plan.

2. Transfer equivalent coursework in written communication taken elsewhere at an accredited college or university with a C- or better and demonstrate competency by passing the writing portfolio assessment.

3. Qualify for a waiver of composition coursework through the CEEB Advanced Placement Examination and

4. Qualify for a waiver of composition coursework through the International Baccalaureate higher level English exam and successfully complete the writing portfolio.

**Quantitative and Qualitative Reasoning Proficiency Requirement**

Well-educated people should be able to think at a certain level of abstraction and to manipulate symbols. The quantitative and qualitative reasoning proficiency requirement has two principal objectives. The first is to provide students with the analytical tools used in core curriculum courses and in their major areas of study. The second is to help students acquire the reasoning skills necessary to assess adequately the problems that confront them in their daily lives.

Students completing this requirement should be able to do the following:

- construct a logical argument based on the rules of inference
- analyze and interpret numerical data
- obtain exact results when appropriate
- apply mathematical methods to solve problems in their university work and in their daily lives.

There are four ways in which students can fulfill this requirement, described as follows:

1. Pass the UCCS Qualitative and Quantitative Reasoning Exam. This exam is offered by the testing office (719) 262-3255. A $20.00 test fee must be paid in advance. Credit hours are not awarded to those who meet the requirement by passing the proficiency examination.

2. Successfully complete ID 105 Quantitative and Qualitative Reasoning Skills OR ID 200 Mathematics: A Human Endeavor OR MATH 120 Reasoning about Data.

3. Successfully complete College Algebra (MATH 104) or a mathematics course that has college algebra as a prerequisite, or score a 20 or above on the Algebra Diagnostic Exam and complete a course in statistics or a course in symbolic logic (from approved list).

4. Successfully complete MATH 301 and MATH 302.

*Area Requirements: Humanities, Social Sciences, and Natural Sciences*

Each prospective LAS graduate is expected to have completed 12 semester hours in each of three areas — humanities, social sciences, and natural sciences. The total requirement is 36 hours, and, with the exception of the core humanities course, can be satisfied entirely by lower division (freshman/sophomore) courses.

Specific Limitations:

No more than two courses from any one discipline may be applied to the area requirements.

With the exception of Distributed Studies, courses in a student's primary major may not be applied to the area requirements.

Courses may not be taken pass/fail.

**Humanities Courses - 12 Credit Hours:**

The humanities course requirement must be satisfied in part by successful completion of one UCCS 300 level humanities courses. The remaining nine hours may be selected from the approved list or may be satisfied by community college humanities courses that are equivalent or similar in content to those listed.

**Social Science Courses - 12 Credit Hours:**

The 12-hour social science area requirement may be met by the lower and upper division courses from the approved list. Students who transfer to UCCS from community colleges may fulfill this area requirement by substituting courses that are equivalent or similar in content to those listed.

**Natural Science Courses - 12 Credit Hours:**
The 12-hour natural science area requirement must include at least one laboratory science course and may be satisfied by the lower and upper division courses from the approved list. Community college students transferring to UCCS may fulfill this requirement by substituting courses that are equivalent or similar in content to those listed.

*Cultural Diversity Requirement*

While fulfilling their general education requirements, LAS students are required to take a course which also increases their awareness of cultural diversity from the approved list.

*Oral Communication Requirement*

LAS Students are required to take a course with a substantial component involving oral communication from the approved list. This course may be within a student's major department, as an elective, or as an approved general education (area requirements) course.

*Global Awareness Requirement*

While fulfilling their general education requirements, LAS students are required to take a course which increases their awareness of global issues from the approved list.

*Foreign Language Requirement*

As of January 1, 1993, the College of Letters, Arts, and Sciences no longer has a foreign language requirement. However, a variety of language classes will continue to be offered for students who wish to study a foreign language. Students contemplating graduate school should be aware that many graduate schools require proficiency in a foreign language.

Newly admitted freshmen are still required to have completed two units of foreign language at the high school level. Freshmen admitted who are deficient in this requirement may make up the deficiency as outlined in the beginning of the College of Letters, Arts, and Sciences section of this *Bulletin*. The foreign language placement examination will continue to be administered for those students wishing to determine their level of placement in a foreign language course.

Students are urged to continue language study in a timely manner, as proficiency declines rapidly without application of skills.

*Note:* If coursework in a foreign language taken at other institutions is repeated at the same level at UCCS, academic credit for any hours duplicated will not be counted toward graduation.

**College of Business Requirements**

*Writing and Communication*

ENGL 131 Rhetoric & Writing I  
ENGL 307 or ENGL 309 or COMM 324  

*Note:* All College of Business students must complete the University Composition Competency requirement. After completing both ENGL 131 and a Non-Freshman Communication Elective course, students must either submit a Writing Portfolio or enroll in an additional writing course.
COMM 201 Comm in Workplace or 210 Public Speaking

*Quantitative Methods*
MATH 104 College Algebra or 111 Linear Algebra
MATH 112 Calculus for Business & Economics
Note: ACT and SAT scores will be used for placement in MATH 104, 111, or 112.
QUAN 202 Process & Statistics-Based Decisions
QUAN 201 Business Statistics

*Computer Literacy*
The College of Business requires that students satisfy a computer literacy requirement prior to entering sophomore level classes offered by the college. Computer literacy may be established by passing INFS 110, transferring an approved equivalent course from another college or institution, or by demonstrating knowledge to the satisfaction of the information systems faculty by examination.

*Humanities and Social & Natural Sciences*
ECON 101 Introduction to Microeconomics
ECON 202 Introduction to Macroeconomics
2 Humanities Electives (from approved list)
Natural Science with Lab (4 credits) (from approved list)
Social Science Elective (from approved list)

*College of Engineering and Applied Sciences Requirements*

Requirements in Common Across Undergraduate Majors

English 131 Rhetoric and Writing I
English 309 Technical Writing and Presentation

Math 135 Calculus I
Math 136 Calculus II
Math 235 Calculus III
3 additional Math courses (approved courses differ by major)

PES 111 General Physics I
PES 112 General Physics II
1 additional Natural Science course (approved courses differ by major)

5 Humanities/Social Science/Business Electives (approved courses differ by major)

*Beth El College of Nursing and Health Sciences*

ENGL 131 Rhetoric and Writing I
ENGL 141 Rhetoric and Writing II

BIOL 201 Anatomy and Physiology I
BIOL 202 Anatomy and Physiology II
BIOL 203 & 213 Microbiology
CHEM 101 Chemistry I
CHEM 102 Chemistry II

HSCI 206 Health Science Statistics

ANTH 104 Cultural Anthropology
PSY 100 General Psychology
SOC 111 Intro to Sociology
2 Humanities Electives (from approved list)
2 General Education Electives (from approved list)

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**UCD requirements**

**Intellectual Competencies:**  **9-10 hours**
Competency courses must earn a minimum letter grade of ‘C–’ (1.7) to satisfy core curriculum Intellectual Competency requirements.

ENGL 1020, English composition I
ENGL 2030, English composition II
Any lower division MATH course

**Knowledge Areas:**  **19-20 hours**
Students may not use core courses in the discipline defined by their major(s) to satisfy any Knowledge Area requirements. In restricted disciplines, only courses approved for the specific Knowledge Area may be used to satisfy Knowledge Area requirements.

**Arts and Humanities**  **6 hours**
For students not majoring in either Arts or Humanities, one course must be from the Arts and the second from the Humanities. For students majoring in Humanities, one course must be from the Arts and the second course may be from either category. For students majoring in Arts, both courses must be from the Humanities.

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<tr>
<th>Arts</th>
<th>Humanities</th>
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<tr>
<td>ARTS</td>
<td>ENGL</td>
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<td>FA</td>
<td>ETST (restricted)</td>
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<td>MUS</td>
<td>Mod Lang (restricted)</td>
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<td>PMUS</td>
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<td>RLST</td>
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**Behavioral and Social Sciences**  **6 hours**
For students not majoring in either the Behavioral or Social Sciences, one course must be from the Behavioral Sciences and the second from the Social Sciences. For students
majoring in Social Science, both courses must come from the Behavioral Sciences. For students majoring in Behavioral Science, both courses must come from the Social Sciences.

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<th>Behavioral Science</th>
<th>Social Science</th>
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<tr>
<td>ANTH (restricted)</td>
<td>ECON</td>
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<td>CMMU</td>
<td>GEOG (restricted)</td>
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<td>ETST (restricted)</td>
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<td>ENVS (restricted)</td>
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**Biological and Physical Sciences, Mathematics**  
7-8 hours

Students must take one biological or physical science course with a laboratory. The second course may be a science course with or without a laboratory, or may be a mathematics course, excluding the course used for Intellectual Competencies mathematics proficiency.

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<tr>
<th>Biological and Physical Sciences</th>
<th>Mathematics</th>
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<td>BIOL</td>
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<td>CHEM</td>
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<td>GEOL</td>
<td>ENVS (restricted)</td>
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<td>PHYS</td>
<td>PSY (restricted)</td>
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**International Perspectives:**  
3 hours

Students must take one international perspectives course. A semester abroad may satisfy this requirement if pre-approved and in a country where the language is not the native language of the student. Courses may be selected from the discipline defined by the student’s major(s).

**Cultural Diversity:**  
3 hours

Students must take one upper division cultural diversity course. Courses may be selected from the discipline defined by the student’s major(s).

**Total Hours in UCDHSC Core Curriculum 34-36 hours**

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Appendix B

**Observations of the CU Boulder Assessment Oversight Committee Regarding Assessment & Accountability**  
October, 2007

The standing Assessment Oversight Committee (AOC) at the University of Colorado at Boulder has considered the Voluntary System of Accountability (VSA) currently being promoted by the
National Association of State Universities and Land Grant Colleges (NASULGC) and would like to discuss potential inadequacies in one part of the program. Specifically, we are skeptical of the VSA’s central reliance on commercially-prepared standardized tests deemed suitable as a useful, comparative, quality measure for all students, all majors, and virtually all institutions of higher education. Our skeptical view on this point is generally shared by the entire University of California system and we further note that thirty one of thirty four members of the American Association of Universities, as of this writing, have declined to employ the College Learning Assessment device, a featured part of the VSA.

Boulder employs a vertical curriculum structure which means that broad educational goals such as effective oral and written discourse, problem solving, and critical thinking are addressed in a style organized around, and included within, those disciplinary majors. More specifically, this style of curriculum structure is quite consistent with the most common pattern of CU-Boulder’s most important peer group, i.e., the thirty four large comprehensive publics comprising the prestigious American Association of Universities. In particular, our undergraduate curriculum, by explicit design, emphasizes vertical integration of so-called general education topics where they are specifically tailored to many different areas of academic emphasis such as science, humanities, engineering, business, journalism, or music. It is also true that there are very substantial differences in emphasis among majors for ‘gen-ed’ topics, even within a school or college.

A vertical curriculum organization, specified by the faculty of each school and college, logically means that academic assessment should be similarly structured. Assessment within the natural sciences should be constructed and carried out by faculty within that area as should assessment within humanities, business, music, engineering, etc. A major theme of assessment should always be a high level of concordance between expressly articulated student learning goals for each campus unit and effective, appropriate modes of making those assessments, customized for enhancing each campus unit’s success in achieving those goals.

The AOC expressed concern over the overly simplistic connection or, worse, interchangeability in language, between assessment and accountability. Assessment has, as its main purposes, improvement of instructional quality and student learning; accountability has, as its main purposes, satisfaction of external entities, institutional rankings, and favorable publicity. The former can easily be distorted and even damaged by misuse of the latter.

We would like to point out three strong recent research efforts that speak to the value of the vertically integrated model of undergraduate education and of the value of local assessment to measure learning outcomes.

The results from the University of Washington, Seattle, Washington study are published in Inside the Undergraduate Experience: The University of Washington's Study of Undergraduate Learning (Catharine Hoffman Beyer, Gerald M. Gillmore and Andrew T. Fisher (Jossey-Bass/Anker, San Francisco, CA., 2007) specifically studying student learning and assessment at the University of Washington as a key exemplar of Research I universities. The central message of that book (Italics not in original): “The most important finding … is that critical thinking and
problem solving are defined by discipline. *Generic explanations of critical thinking and problem solving, though perhaps accurate at some high level of abstraction, are fairly useless …*”

Similarly, the University of California Educational system report emphasizes academic discipline orientation. (Italics not in original)


“**Abstract:** The University of California’s census survey of undergraduates, UCUES, … measure{d} both disciplinary and institutional differences in students’ academic experience. Results from nearly 60,000 responses … found greater variance among majors within an institution than between equivalent majors across institutions. … Reporting practices called into question (include} institutional comparisons that ignore academic program mix and discipline {or} … campus performance comparisons that do not recognize pedagogical differences by academic major. More specifically, these results suggest that calls for comparable institutional performance measures, as proposed by the Spellings Commission, must take into consideration disciplinary differences in instruction.”
http://cshe.berkeley.edu/publications/publications.php?id=263

Thirdly, here is a quote from the Executive Summary of the Learning Assessment Forum, Washington University, St. Louis, Mo. 2007 (Italics not in original)

“It is important to note that the standards for educational quality have always been determined by individual colleges and universities in the context of their particular mission, history, and specialties. The current system of accreditation … respects and values the unique mission of each institution. The diversity of institutions is one of the great strengths of American higher education. … Externally imposed fixed standards of academic performance across disciplines and across institutions provide little useful information to consumers or policymakers. The Spellings Commission recommended that “accreditation agencies should make performance outcomes, completion rates and student learning, the core of their assessment as a priority over inputs or processes.” We agree that student outcomes are important and should be assessed. However, the responsibility for both setting educational objectives and selecting methods for measuring performance must rest with individual colleges and universities.”

The current standardized testing component of the VSA effort does not attend to nor effectively recognize these serious objections but, rather, continues to insist that any one of three corporate-sponsored, standard testing instruments are adequate and sufficient to measure and compare the educational quality of entire, hugely complex, comprehensive institutions.

Lastly, we understand there are some preliminary discussions about the American Association of Universities organization developing an assessment protocol which fits their mission {i.e., Research I missions} substantially better than does the VSA effort.
If the AAU or some other Research I institutions, such as the campuses of the University of California system with which we routinely compete for faculty, research grants, scholarly honors and students, develops a protocol, perhaps in the VSA mold but tailored for those types of
institutions, UC-Boulder would be favorably inclined to readily join and participate. Rather than invest in generic assessment instruments, we are interested in creating and using meaningful assessments that help us improve student learning.

Appendix C: CAT Assessment Tool

CAT—Example of a Potential New Assessment Tool Relevant to the Mission of CU-Boulder

The Boulder campus would like to be able to consider testing the CAT instrument (Critical Thinking Assessment Test), briefly described below, which is designed to assess critical thinking skills. CU-Boulder finds this instrument attractive partly because its development has been largely sponsored by the National Science Foundation, has been extensively evaluated by many faculty from many disciplines at multiple universities and will be available at minimal or even no cost since it was developed by the NSF. The program has just now moved into the dissemination phase and CU-Boulder plans to be an active participant. We think it crucial to note that a major share of the Boulder campus’s external support comes from the National Science Foundation which means that this NSF-sponsored instrument fits our mission significantly better than those produced by corporate entities. It is also true that the group of universities who employ this CAT will, almost by definition, have missions very similar to CU-Boulder’s. In particular, those institutions will have a major emphasis on cutting edge scientific research across many fields sponsored by the NSF. It is our view those institutions would likely provide an appropriate and reasonable comparison group to CU-Boulder whenever inter-institutional comparisons were desired.

“The Critical Thinking Assessment Test (CAT) is a unique tool designed to assess and promote the improvement of critical thinking and real-world problem solving skills. The instrument is the product of extensive development, testing, and refinement with a broad range of institutions, faculty, and students across the country. The National Science Foundation has provided support for many of these activities.

The findings discussed below indicate that faculty across institutions and across disciplines generally view the skills targeted for assessment and the test questions in the CAT instrument valid indices of critical thinking. Faculty have been very enthusiastic about the test and opportunities to continue using it. We will continue to explore suggestions for improving the instrument this coming year as we analyze the input from faculty at the most recent scoring workshops. Faculty comments at the most recent scoring workshops at Howard University, the University of Colorado, and the University of Washington indicate that the scoring activity is engaging, informative, and valuable. Many faculty have commented that they will explore alternative pedagogies in their classes to improve what they consider to be deficiencies in students’ critical thinking skills.” More details are available at http://www.tntech.edu/cat/
Members of the Ad Hoc Committee

Michel Dahlin, co-chair
Ellen Stevens, co-chair
David Moon
Kathryn Andrus
Debra Dew
Don Morely
Michael Grant
Clayton Lewis
Mary Ann Shea
Kenneth Wolf
John Lanning
Amy Vidali