

Assessment Workshop: Resource Handbook

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For additional resources, please see the Office of Academic Assessment's website:

www.usm.maine.edu/assessment click on Assessment Tools/Literature under Quick Links.

What is Outcomes Assessment?

Outcomes Assessment is a systematic process of gathering and interpreting information to discover if a program is meeting established objectives, and then using that information to enhance the program.

A good assessment process can answer three related questions:

- *What are we trying to do?
- *How well are we doing it?
- *How are we using what we discover to improve the program?

Student learning outcomes will determine whether a program is helping students achieve the intended learning outcomes in the major, in general education, or in other areas. More importantly, what are your students not learning. Knowing the areas where students are not learning is essential in order to inform the decision making process. Assessing outcomes allows programs to focus on what students know and can do after they complete a specific program.

It is good assessment practice to assess a program in a variety of ways; such as:

- Student and alumni surveys (self-reported information, feedback from students)
- Passing rates on comprehensive exams, certification tests, etc)
- Performance assessments (evaluations or reports from supervisors, etc)
- Actual student work products (papers, assignments, research studies, etc)

Of these listed above, actual student work products (direct assessment) is the information that is the most useful in determining if students have learned what is described in the outcomes. This is different from using grades. Even though course grades are based on actual student work products, what goes into the calculation of a grade might be more than what is necessary to see if a student has mastered material for a specific student learning outcome. For example, a grade might include attendance or other course requirements that are not part of a specific learning outcome. For these reasons, it is not considered appropriate or meaningful to use grades as a measure for student outcomes assessment. (Walvoord, *Assessment Update*, 1998).

Purpose of Assessment

The purpose of assessing student learning outcomes is to:

- 1) Ensure that students are learning what we want them to learn.
- 2) Provide an opportunity to make programmatic improvements based on assessments.
- 3) Document student learning for interested stakeholders (NEASC accrediting agency, for the university as a whole, for students and parents, and general public).
- 4) Use the assessment data (evidence) to demonstrate student learning and to improve it.

Important Note:

Outcomes assessment is not an evaluation of individual students, or of individual faculty or staff; rather, it is a process that provides each academic program, department, school/college, or related administrative unit with valuable feedback about overall performance related to curriculum, learning success, and/or services and goals. The assessment focus of each department/unit is on showing how the purpose or mission of the university is being accomplished through that particular unit. The emphasis is on the benefits or results of the learning or services provided—specifically on the outcomes that are experienced by those involved.

(Source: Assessing Student Learning: A Common Sense Guide by Linda Suskie, 2009)

Glossary of Assessment Terms

Learning Outcomes

Learning Outcomes are statements that specify what students will know or be able to do as a result of earning their degrees. Outcomes are usually expressed as knowledge, skills, or abilities

Characteristics of good learning outcomes:

The specified action by the students must be observable.

The specified action by the students must be measurable.

The specified action must be done by the students.

The verb chosen for each outcome statement should be an action verb which results in overt behavior that can be observed and measured.

Examples of Weak and Strong Learning Outcomes		
Weak Learning Outcome	<i>Upon successful completion of the program students will be exposed to case studies documenting the use of ethical reasoning in daily decisions.</i>	<p>The action is <u>not</u> done by the students. It is observable: Teachers can be observed as they are presenting the case studies to the students. The number of case studies to which students are exposed could be measured. Because the action is not done by the students this outcome needs to be reworded.</p>
Strong Learning Outcome	<i>Upon successful completion of the program students will be able to apply ethical reasoning in discussing an ethical issue.</i>	<p>The action is done by the student: the student applies ethical reasoning. It is observable: The student can be given an assignment in which they are required to apply ethical reasoning. It is measurable: The expectations can be defined and student's performance measured against those standards.</p>

Glossary of Assessment Terms

Outcome Measures

Outcome Measures are the specific tools, methods, tests, etc., that provide the data indicating how well students meet learning outcomes at the pre-defined level (performance standard).

Direct Outcome Measures evaluate actual samples of student work or student performance.

Indirect Outcome Measures compliment direct measures by providing: supportive evidence, information, and student perspective through methods including; surveys, employer and supervisor surveys, exit interviews, focus groups etc.

Performance Standards specify the acceptable level of student work. For each learning outcome the program should ask “What is an acceptable performance for this learning outcome?” Example: Students achieve a rating of “Meets Standard” on the rubric designed to measure the learning outcome.

Data Collection

Data are the numbers/ratings/scores that are used for analysis.

Data may be either qualitative or quantitative.

Analysis

Analyses summarize and explain the data which allows inferences to be made. They summarize the data, enhance the value of information gathered and provide direction for decisions regarding program improvement. The report should contain evidence of appropriate analyses sufficient for inferences to be drawn about the extent the learning outcomes have been measured.

Report

Executive Summary describes the entire assessment process, including highlights of new assessment initiatives and a summary detailing effectiveness of changes made to the program based on suggestions from the previous assessment cycle.

Appendix contains copies of rubrics, exams, surveys, and other instruments used during the assessment cycle which enable reviewers and others reading the report to see what instruments were used in assessing student performance. It also may contain notes from faculty meetings regarding assessment. These notes should identify links between assessment results and program decisions. The appendix should not contain actual data nor sample copies of student work. This added documentation will facilitate better understanding particularly in a situation when others review the report or a new chair takes over guidance of a program’s assessment.

Curricular Map of Student Learning Outcomes

Enter course numbers for your department across the top of the matrix. In the column below, indicate where the student learning outcome is "introduced," "emphasized," "reinforced," or "assessed."

I = Outcome is introduced E = Outcome is emphasized R = Outcome is reinforced A = Outcome is assessed

Course numbers →	101	102	200	207	302	303	304	306	311	314	315	321	Capstone Assessment
Outcome 1 (Example): Critical Thinking Skills		I	E, A		R	R	R	R	R	R	R	R, A	A
Outcome 1													
Outcome 2													
Outcome 3													
Outcome 4													
Outcome 5													

Three-Year Assessment cycle: Assess Outcomes 1 and 3 (2014-15) Assess Outcomes 2 and 4 (2015-16) Assess Outcome 5 (2016-17)

Examples of Direct and Indirect Measures of Student Learning (Course, Program, and Institutional Levels)

	Direct Measures	Indirect Measures
Course	<ul style="list-style-type: none"> • Course and homework assignments • Examinations and quizzes • Standardized tests • Term papers and reports • Observations of field work, internship performance, service learning, or clinical experiences • Research projects • Class discussion participation • Rubric (a criterion-based rating scale) scores for writing, oral presentations, and performances • Artistic performances and products • Grades that are based on explicit criteria related to clear learning goals 	<ul style="list-style-type: none"> • Course evaluation • Test blueprints (outlines of the concepts and skills covered on tests) • Percent of class time spent in active learning • Number of student hours spent on service learning • Number of student hours spent on homework • Number of student hours spent at intellectual or cultural activities related to the course • Grades that are not based on explicit criteria related to clear learning goals
Program	<ul style="list-style-type: none"> • Capstone projects, senior theses, exhibits, or performances • Pass rates or scores on licensure, certification, or subject area tests • Student publications or conference presentations • Employer and internship supervisor ratings of students performance 	<ul style="list-style-type: none"> • Focus group interviews with students, faculty members or employers • Registration or course enrollment information • Department or program review data • Job placement • Employer or alumni surveys • Student perception surveys • Proportion of upper-level courses compared to the same program at other institutions • Graduate school placement rates
Institutional	<ul style="list-style-type: none"> • Performance on tests of writing, critical thinking, or general knowledge • Rubric (criterion-based rating scale) scores for class assignments in General Education, interdisciplinary core courses, or other courses required of all students • Performance on achievement tests • Explicit self-reflections on what students have learned related to institutional programs such as service learning (e.g., asking students to name the three most important things they have learned in the program) 	<ul style="list-style-type: none"> • Locally-developed, commercial, or national surveys of student perceptions or self-report of activities (e.g. National Survey of Student Engagement) • Transcript studies that examine patterns and trends of course selection and grading • Annual reports including institutional benchmarks, such as graduation and retention rates, grade point averages of graduates, etc.

Summary of *Direct Assessment Techniques*

DIRECT ASSESSMENT TECHNIQUES (Assessing Academic Programs in Higher Education by Allen 2004)		
Technique	Potential Strength	Potential Limitations
Published tests	<ul style="list-style-type: none"> • Can provide direct evidence of student mastery of learning objectives • Generally, are carefully developed, highly reliable, professionally scored, and nationally normed • Frequently provide a number of norm groups, such as norms for community colleges, liberal arts colleges, and comprehensive universities • Online versions of tests are increasingly available, and some provide immediate scoring • Some publishers allow faculty to supplement tests with their own items, so tests can be adapted to better serve local needs 	<ul style="list-style-type: none"> • If the test does not reflect the learning objectives that faculty value and the curricula that students experience, results are likely to be discounted and inconsequential • Most published tests rely heavily on multiple-choice items that often focus on specific facts, but program learning objectives more often emphasize higher-level skills • Test scores may reflect criteria that are too broad for meaningful assessment • Students may not take the test seriously if test results have no impact on their lives • Tests can be expensive • The marginal gain from annual testing may be low • Faculty may object to standardized exam scores on general principles, leading them to ignore results
Locally developed tests	<ul style="list-style-type: none"> • Can provide direct evidence of student mastery of learning objectives • Appropriate mixes of items allow faculty to address various types of learning objectives • Can provide for authentic assessment of higher-level learning • Students generally are motivated to display the extent of their learning • If well constructed, they are likely to have good validity • Because local faculty write the exam, they are likely to be interested in results and willing to use them • Can be integrated into routine faculty workloads • Campuses with similar missions could decide to develop their own norms, and they could assess student work together or provide independent assessment of each other's student work • Discussion of results focuses faculty on student learning and program support for it 	<ul style="list-style-type: none"> • These exams are likely to be less reliable than published exams • Reliability and validity generally are unknown • Creating effective exams requires time and skill • Score exams takes time • Traditional testing methods may not provide authentic measurement • Norms generally are not available
Embedded assignments and course activities	<ul style="list-style-type: none"> • Can provide direct evidence of student mastery of learning objectives • Out-of-class assignments are not restricted to time constraints typical for exams • Students are generally motivated to demonstrate the extent of their learning • Can provide authentic assessment of learning objectives • Can involve ratings by fieldwork supervisors • Can provide a context for assessing communication and teamwork skills, as well as other types of learning objectives • Can be used for grading as well as assessment • Faculty who develop the procedures are likely to be interested in results and willing to use them • Discussion of results focuses faculty on student learning and program support for it • Data collection is unobtrusive to students 	<ul style="list-style-type: none"> • Requires time to develop and coordinate • Requires faculty trust that the program will be assessed, not individual teachers • Reliability and validity generally are unknown • Norms generally are not available

DIRECT ASSESSMENT TECHNIQUES
(Assessing Academic Programs in Higher Education by Allen 2004)

Technique	Potential Strength	Potential Limitations
Competence interviews	<ul style="list-style-type: none"> • Can provide direct evidence of student mastery of learning objectives • The interview format allows faculty to probe for the breadth and extent of student learning • Can be combined with other techniques that more effectively assess knowledge of facts and terms • Can involve authentic assessment, such as simulated interactions with clients • Can provide for direct assessment of some student skills, such as oral communication, critical thinking, and problem-solving skills 	<ul style="list-style-type: none"> • Requires time to develop, coordinate, schedule, and implement • Interview protocols must be carefully developed • Subjective judgments must be guided by agreed-upon criteria • Interviewer training takes time • Interviewing using unstructured interviews requires expertise • Not an efficient way to assess knowledge of specific facts and terms • Some students may be intimidated by the process, reducing their ability to demonstrate their learning
Portfolios	<ul style="list-style-type: none"> • Can provide direct evidence of student mastery of learning objectives • Students are encouraged to take responsibility for and pride in their learning • Students may become more aware of their own academic growth • Can be used for developmental assessment and can be integrated into the advising process to individualize student planning • Can help faculty identify curriculum gaps • Students can use portfolios and the portfolio process to prepare for graduate school or career applications • Discussion of results focuses faculty on student learning and program support for it • Webfolios or CD-ROMs can be easily viewed, duplicated, and stored 	<ul style="list-style-type: none"> • Requires faculty time to prepare the portfolio assignment and to assist students in preparing portfolios • Requires faculty analysis and, if graded, faculty time to assign grades • May be difficult to motivate students to take the task seriously • May be more difficult for transfer students to assemble the portfolio if they haven't saved relevant materials • Students may refrain from criticizing the program if their portfolio is graded or if their names will be associated with portfolios during the review • It may be difficult to protect student confidentiality and privacy
Collective portfolios	<ul style="list-style-type: none"> • Can provide direct evidence of student mastery of learning objectives • Students generally are motivated to display the extent of their learning • Workload demands generally are more manageable than traditional portfolios • Students are not required to do extra work • Discussion of results focuses faculty on student learning and program support for it • Data collection is unobtrusive to students 	<ul style="list-style-type: none"> • If assignments are not aligned with the objectives being examined, evidence may be problematic • If sampling is not done well, results may not generalize to the entire program • Reviewing the materials takes time and planning

Choosing the Right Assessment Tools

(Based on Fulks, Janet, "Assessing Student Learning in Community Colleges", Bakersfield College, 2004 obtained at <http://online.bakersfieldcollege.edu/courseassessment/Default.htm>)

Examples of various assessment tools are included in the table below. It should be noted that the categorizations may vary depending upon your perspective and the way in which you construct the assessment.

Tool	Method D= Direct I= Indirect	Domain C= Cognitive P= Psychomotor A= Affective	Usage Type F= Formative S= Summative	Bloom's level K= Knowledge C= Comprehension A= Application ASE= Analysis or Synthesis or Evaluation	Pros	Cons
Multiple Choice Exam	D	C	F or S	K, C If carefully constructed ASE	easy to grade; objective	reduces assessment to multiple choice answers
Licensing Exams	D	C	S	K, C, A	easy to score and compare	no authentic testing, may outdate
Standardized Cognitive Tests	D	C	S	K, C, A?	comparable between students	heavily dependent on exposure to topics on test
Checklists	D	C, A, P	F or S	Variable	very useful for skills or performances; students know exactly what is missing	can minimize large picture and interrelatedness; evaluation feedback is basically a yes/no - present/absent - without detail
Essay	D	C, A	F or S	K, C, A, ASE	displays analytical and synthetic thinking well	time consuming to grade, can be subjective
Case Study	D	C, A	F or S	K, C, A, ASE	displays analytical and synthetic thinking well; connects other knowledge to topic	creating the case is time consuming, dependent on student knowledge from multiple areas
Problem Solving	D	C	F or S	K, C, A, ASE	displays analytical and synthetic thinking well; authentic if real world situations are used	difficult to grade due to multiple methods and potential multiple solutions
Oral Speech	D	C	F or S	Variable K, C, A, ASE	easily graded with rubric; allows other students to see and learn what each student learned; connects general education goals with discipline-specific courses	difficult for ESL students; stressful for students; takes course time; must fairly grade course content beyond delivery
Debate	D	C, A	F or S	K, C, A, ASE	provides immediate feedback to the student; reveals thinking and ability to respond based on background knowledge and critical thinking ability	requires good rubric; more than one evaluator is helpful; difficult for ESL students; stressful for students; takes course time

Tool	Method D= Direct I= Indirect	Domain C= Cognitive P= Psychomotor A= Affective	Usage Type F= Formative S= Summative	Bloom's level K= Knowledge C= Comprehension A= Application ASE= Analysis or Synthesis or Evaluation	Pros	Cons
Product Creation & Special Reports	D	C, P, A	F or S	Variable K, C, A, ASE	students can display skills, knowledge, and abilities in a way that is suited to them	must have clearly defined criteria and evaluative measures; "the look" can not override the content
Flowchart or Diagram	D	C	F or S	C, A, ASE	displays original synthetic thinking on the part of the student; perhaps the best way to display overall high level thinking and articulation abilities	more difficult to grade, requiring a checklist or rubric for a variety of different answers; difficult for some students to do on the spot
Portfolios	D	C, P	S	Variable	provides the students with a clear record of their work and growth; best evidence of growth and change over time; students can display skills, knowledge, and abilities in a way that is suited to them; promotes self-assessment	Time consuming to grade; different content in portfolio makes evaluating difficult and may require training; bulky to manage depending on size
Exit Surveys	D and I	A	S	ASE	provides good summative data; easy to manage data if Likert-scaled responses are used	Likert scales limit feedback, open-ended responses are bulky to manage
Performance	D	C, P	F or S	Variable K, C, A, ASE	provides best display of skills and abilities; provides excellent opportunity for peer review; students can display skills, knowledge, and abilities in a way that is suited to them	stressful for students; may take course time; some students may take the evaluation very hard - evaluative statements must be carefully framed
Capstone project or course	D	C, P, A	F or S	ASE	best method to measure growth overtime with regards to a course or program - cumulative	focus and breadth of assessment and understanding all the variables to produce assessment results are important; may result in additional course requirements; requires coordination and agreement on standards

Tool	Method D= Direct I= Indirect	Domain C= Cognitive P= Psychomotor A= Affective	Usage Type F= Formative S= Summative	Bloom's level K= Knowledge C= Comprehension A= Application ASE= Analysis or Synthesis or Evaluation	Pros	Cons
Team Project	D	C, A	F or S	Variable K, C, A, ASE	connects general education goals with discipline-specific courses	must fairly grade individuals as well as team; grading is slightly more complicated; student interaction may be a challenge
Reflective self-assessment essay	D and I	C, A	S	ASE	provides invaluable ability to evaluate affective growth in students	must use evidence to support conclusions, not just self-opinionated assessment
Satisfaction and Perception Surveys	I	C, P, A	S	C, A, ASE	provides good indirect data; data can be compared longitudinally; can be used to determine outcomes over a long period of time	respondents may be influenced by factors other than those being considered; validity and reliability must be closely watched

Assessment Tool Checklist



1.	Does the assessment adequately evaluate academic performance relevant to the desired outcome? (validity)	
2.	Does this assessment tool enable students with different learning styles or abilities to show you what they have learned and what they can do?	
3.	Does the content examined by the assessment align with the content from the course? (Content validity)	
4.	Does this assessment method adequately address the knowledge, skills, abilities, behavior, and values associated with the intended outcome? (Domain validity)	
5.	Will the assessment provide information at a level appropriate to the outcome? (Bloom's)	
6.	Will the data accurately represent what the student can do in an authentic or real life situation? (Authentic assessment)	
7.	Is the grading scheme consistent; would a student receive the <i>same</i> grade for the <i>same</i> work on multiple evaluations? (Reliability)	
8.	Can multiple people use the scoring mechanism and come up with the same general score? (Reliability)	
9.	Does the assessment provide data that is specific enough for the desired outcomes? (alignment with outcome)	
10.	Is the assessment summative or formative - if formative does it generate diagnostic feedback to improve learning?	
11.	Is the assessment summative or formative - if summative, is the final evaluation built upon multiple sources of data? (AAHE Good practice)	
12.	If this is a summative assessment, have the students had ample opportunity for formative feedback and practice displaying what they know and can do?	
13.	Is the assessment unbiased or value-neutral, minimizing an attempt to give desirable responses and reducing any cultural misinterpretations?	
14.	Are the intended uses for the assessment clear? (Grading, program review, both)	
15.	Have other faculty provided feedback?	
16.	Has the assessment been pilot-tested?	
17.	Has the evaluation instrument been normed?	
18.	Will the information derived from the assessment help to improve teaching and learning? (AAHE Good Practice)	
19.	Will you provide the students with a copy of the rubric or assignment grading criteria?	
20.	Will you provide the students examples of model work?	

Rubric Examples

5: Distinguished
3: Proficient
1: Emerging

Six Traits for Analyzing Historical Writing
Scoring Guide
MONTANA HERITAGE PROJECT

Word Choice

5 Words convey the intended message in a precise, interesting, and natural way.

- G Words are specific and accurate. It is easy to understand what the writer means.
- G Striking words and phrases often catch the reader's eye and linger in the reader's mind.
- G Language and phrasing is natural, effective, and appropriate for the audience.
- G Lively verbs add energy while specific nouns and modifiers add clarity.
- G Precision is obvious. The writer has taken care to put just the right word or phrase in just the right spot.

3 The language is functional, even if it lacks much energy. It is easy to figure out the writer's meaning on a general level.

- G Words are adequate and correct in a general sense, and they support the meaning by not getting in the way.
- G Familiar words and phrases communicate but rarely capture the reader's imagination.
- G Attempts at colorful language show a willingness to stretch and grow but sometimes detract. (thesaurus overload!).
- G Passive verbs, everyday nouns, and mundane modifiers create little excitement.
- G The language seems to be the first thing that popped into the writer's mind.

1 The writer demonstrates a limited vocabulary or has not searched for words to convey specific meaning.

- G Words are too nonspecific to convey much meaning.
- G Incorrect language distracts from the meaning.
- G Limited vocabulary limits communication.
- G Words and phrases are unimaginative and lifeless.
- G Jargon or clichés distract or mislead. Redundancy may distract the reader.

Sentence Fluency

5 The writing has an easy flow, rhythm, and cadence. Sentences have strong and varied structure that makes them fun to read aloud.

- G Sentences are constructed to emphasize and enhance meaning.
- G Sentences vary in length as well as structure. Fragments, if used, add style. Dialogue, if present, sounds natural.
- G Purposeful and varied sentence beginnings add variety and energy.
- G Creative and precise transitions between sentences and thoughts shows how each relates to the one before it.
- G The writing has cadence; the writer has thought about the sound of the words as well as the meaning. It is easy to read aloud.

3 The text moves along in a way that's more mechanical than fluid or musical.

- G Sentences get the job done in a routine fashion.
- G Sentences are usually constructed correctly.
- G Sentence beginnings are not ALL alike; some variety is attempted.
- G The reader sometimes has to hunt for clues that show how sentences or ideas are related.
- G Parts of the text may be stiff, awkward, or choppy.

1 The reader has to practice to read this paper aloud. It's confusing.

- G Sentences are choppy, incomplete, rambling or awkward. Phrasing does not sound natural.
- G Sentences do not hang together.
- G Many sentences begin the same way—and follow the same patterns.
- G Thoughts are jumbled.
- G The text does not invite expressive oral reading.

Conventions

5 The writing is complex enough to show skill with a wide range of conventions. Spelling, punctuation, capitalization, grammar, usage, and paragraphing enhance readability.

- G Spelling is generally correct, even on difficult words.
- G Accurate punctuation guides readers through the text.
- G Capitalization is correct and consistent.
- G Grammar and usage are correct, and contribute to clarity and style.
- G Paragraphs have topic sentences, supporting details.
- G The piece is nearly ready to publish.

3 Conventions are sometimes handled well and enhance readability; at other times, errors distract the reader.

- G Spelling is usually correct or reasonably phonetic.
- G Punctuation (commas, apostrophes, semicolons, dashes, colons, parentheses) is sometimes wrong.
- G Control over sophisticated capitalization is spotty.
- G Problems with grammar or usage do not distort meaning but may not always be correct.
- G Paragraphing is attempted but may begin in the wrong places. Paragraphs contain material that doesn't belong.
- G Moderate editing would be needed before publication.

1 Errors in spelling, punctuation, capitalization, usage, and grammar and/or paragraphing distract the reader and make the text difficult to read.

- G Spelling errors are frequent.
- G Punctuation is often missing or incorrect.
- G Capitalization is random.
- G Errors in grammar or usage frequently affect meaning.
- G Paragraphing is missing or has no relationship to the organizational structure of the text.
- G The text is hard to decode. Re-writing would be required before publication.

Six Traits for Analyzing Historical Writing

Organization

5 The paper is organized around a central thesis, which is stated in the first paragraph.

- G An inviting introduction draws the reader in; a satisfying conclusion creates a sense of closure.
- G Clear transitions create relationships between ideas
- G Paragraphs have topic sentences, and details that fit.
- G Pacing is well controlled, sometimes slowing down to elaborate and sometimes moving on quickly.
- G The title catches the reader's attention and captures the central theme of the piece.
- G The organization is easy to follow.

3 The paper has a main idea and the organizational structure is clear enough to move the reader through the text without much confusion.

- G The paper has a recognizable introduction but doesn't create anticipation. The conclusion may not tie up all the loose ends.
- G Connections between ideas are fuzzy.
- G Sequencing shows some logic.
- G The writer rushes ahead without enough detail, or spends too much time on unimportant details.
- G The title is uninspired or obvious.
- G The reader is unsure why some material is included.

1 The writing lacks a clear sense of direction. Ideas, details, or events seem strung together in a loose or random structure.

- G There is no real thesis to set up an introduction, no real conclusion to wrap things up.
- G Connections between ideas are confusing.
- G Sequencing is hard to follow and unsatisfying.
- G The writing slows to a crawl when the reader wants to get on with it and vice versa.
- G Title does not match the content.
- G Disorganization makes the paper hard to understand.

Ideas and Content

5 The paper is clear and focused. It holds the reader's attention. Accurate research from various sources illustrates and supports the thesis. Citations are complete and accurate.

- G The thesis is narrow enough to manage.
- G Relevant, telling, quality details from research go beyond the obvious.
- G The ideas are fresh and original.
- G The reader's questions are anticipated and answered.

3 The writer is beginning to define the topic, even though development is still basic or general.

- G The thesis is fairly broad.
- G Some research is cited but doesn't go far in supporting thesis.
- G Ideas are reasonably clear, though they may not be detailed, personalized, accurate, or supported by evidence.
- G The writer has difficulty going from general observations to specifics.
- G More information is needed to "fill in the blanks."
- G The writer generally stays on the topic but does not develop a clear theme.

1 The paper has no clear sense of purpose or central theme.

- G The writer has not yet decided what the main idea of the piece will be.
- G Information is limited or unclear or drawn from one or two sources.
- G The idea is a simple restatement of the topic or an answer to the question with little or no attention to detail.
- G It's hard to see what is important.
- G Disconnected, random or repetitious thoughts.

Voice

5 The writer crafts the writing with an awareness and respect for the audience and the purpose for writing.

- G The tone is clear and consistent and appropriate for the purpose and audience.
- G The words sound honest and authentic; not pompous or pretentious.
- G The writer shows why the reader should care about the topic.
- G There is a high meaning-to-syllable ratio—no padding.
- G The writing is elegant: everything necessary is present, and everything present is necessary.

3 The writer seems sincere but not fully engaged or involved. The result is pleasant or even personable, but not compelling.

- G The writer settles too easily for obvious generalities.
- G The writing communicates in an earnest, pleasing, yet safe manner.
- G Only one or two moments here or there intrigue, delight, or move the reader.
- G Some passages seem written to fill the page rather than to engage the reader.

1 The writer seems indifferent, uninvolved, or distanced from the topic and/or the audience.

- G The writer is not concerned with the audience. The writer's style doesn't match the intended audience. The paper is so short that little is accomplished beyond introducing the topic.
- G The writer speaks in monotone that flattens all thoughts or seems to be trying to impress the reader with lofty, unsupported diction or sentiments.
- G The writing is lifeless or mechanical; it may be jargonistic.
- G The development of the theme is so limited that no point of view is presented.

Studio Art Assignment Rubric

	Beginning (12-13)	Developing (14-15)	Apprentice (16-17)	Mastery (18-20)
Expression	Work appears to have limited unique characteristics.	Work has some unique forms or composition, although in large part references previous work.	Work appears unique in its compositional arrangement, with little reference to previous work.	Work appears unique in its concept with no apparent reference to previous work or known cultural icons.
Technique	Work contains many errors, improper use of materials, little understanding of technique.	Student demonstrates a developing ability with material and technique, with a number of errors.	Student demonstrates a high level of success with material and technique. Few errors in completion.	Student demonstrates a mastery of materials and techniques.
Design and Composition	Parts of the composition appear disconnected, and a unified whole is not achieved.	Some elements of the work appear unified, although some disconnected elements distract from the visual order.	Work appears unified with few distractions in the visual order with regard to the elements and principles of design.	A professional level of unity is achieved with regard to composition.
Assignment Parameters	Student failed to address most of the assignment requirements.	Student did not satisfy some of the assignment requirements.	Student satisfied the assignment requirements.	Student completed the assignment requirements and made interesting personal contributions.

Quantitative Rubric

Quantitative Rubric	Algebraic	Graphic	Numeric	Verbal
4 Exemplary	<ul style="list-style-type: none"> - Accurately derives, uses, and/or manipulates algebraic representations of pertinent data and/or problem elements. - Interprets logical relationships between problem elements and aptly characterizes the underlying logic with mathematical symbols. 	<ul style="list-style-type: none"> - Graphic displays accurately and completely represent the data and/or algebraic relationships between problem elements, are accompanied by equations from analysis, and have clear labels. - Analysis draws appropriate inferences from graphic displays. 	<ul style="list-style-type: none"> - Accurately identifies quantitative information pertinent to the solution of a problem. - Uses quantitative information in a solution that supports appropriate translations between different modes of thinking (algebraic, graphic, and/or verbal) about the problem. 	<ul style="list-style-type: none"> - Succinct explanation presents a reasoned account of the answer, which may include pertinent examples or counter-examples. - Appropriate translations between different modes of thinking (algebraic, graphic, and/or numeric) about the problem are used to establish a sound scholarly explanation and explicate the underlying logic of the answer.
3 Competent	<ul style="list-style-type: none"> - Algebraic representations are accurate and demonstrate competent translation of the problem into mathematical symbols. - Logical interpretations of problem elements are correct, but are in some ways incomplete to support full integration of different modes of thinking (graphic, numeric, and/or verbal). 	<ul style="list-style-type: none"> - Graphic displays are accurate and completely represent the data and/or algebraic relationships between problem elements. - Graphic displays may not be accompanied with complete and appropriate analytic inference. 	<ul style="list-style-type: none"> - Correctly identifies quantitative information to solve the problem. - Numeric information asked for in the problem is given, but the solution does not go beyond the question posed. - Robust interpretation of the numeric information is not presented. 	<ul style="list-style-type: none"> - The answer is correct and demonstrates thoroughness and competence working with the task's mathematical concepts and processes. - The argument may not completely capture appropriate translations between different modes of thinking (algebraic, graphic, and/or numeric) about the problem.
2 Developing	<ul style="list-style-type: none"> - It may be unclear what algebraic relationships are used that best and/or correctly characterize pertinent data and/or problem elements. 	<ul style="list-style-type: none"> - Graphic displays are incomplete, poorly labeled, and/or hard to follow. - Graphic displays are not presented in ways that support further interpretation of the elements of the problem. 	<ul style="list-style-type: none"> - Quantitative information is partially correct but incomplete. - Quantitative information is presented in ways that do not lead to other modes of thinking (algebraic, graphic, and/or verbal) about the problem. 	<ul style="list-style-type: none"> - The answer may be partially correct, but the argument may be poorly focused or weak or poorly conceived. - Major ideas related to the content may be ignored or inadequately explored. - Appropriate translations between different modes of thinking (algebraic, graphic, and/or numeric) about the problem may be inadequately explored or incorrectly reported.
Quantitative Rubric	Algebraic	Graphic	Numeric	Verbal
1 Beginning	<ul style="list-style-type: none"> - Presentation fails to correctly identify mathematical variables and processes pertinent to the solution of the problem. 	<ul style="list-style-type: none"> - Graphic displays do not accurately represent data and/or algebraic relationships between problem elements. 	<ul style="list-style-type: none"> - Quantitative information given is incorrect. 	<ul style="list-style-type: none"> - Content is poorly focused and lacks organization. - Fails to demonstrate thoroughness and competence. - The reader is left with little information about or understanding of the solution and its interpretation.

CIT Computer Programming Rubric

	Unsatisfactory	Satisfactory	Good	Excellent
Delivery	<ul style="list-style-type: none"> Completed less than 70% of the requirements. Not delivered on time or not in correct format (disk, email, etc.) 	<ul style="list-style-type: none"> Completed between 70-80% of the requirements. Delivered on time, and in correct format (disk, email, etc.) 	<ul style="list-style-type: none"> Completed between 80-90% of the requirements. Delivered on time, and in correct format (disk, email, etc.) 	<ul style="list-style-type: none"> Completed between 90-100% of the requirements. Delivered on time, and in correct format (disk, email, etc.)
Coding Standards	<ul style="list-style-type: none"> No name, date, or assignment title included Poor use of white space (indentation, blank lines). Disorganized and messy Poor use of variables (many global variables, ambiguous naming). 	<ul style="list-style-type: none"> Includes name, date, and assignment title. White space makes program fairly easy to read. Organized work. Good use of variables (few global variables, unambiguous naming). 	<ul style="list-style-type: none"> Includes name, date, and assignment title. Good use of white space. Organized work. Good use of variables (no global variables, unambiguous naming) 	<ul style="list-style-type: none"> Includes name, date, and assignment title. Excellent use of white space. Creatively organized work. Excellent use of variables (no global variables, unambiguous naming).
Documentation	<ul style="list-style-type: none"> No documentation included. 	<ul style="list-style-type: none"> Basic documentation has been completed including descriptions of all variables. Purpose is noted for each function. 	<ul style="list-style-type: none"> Clearly documented including descriptions of all variables. Specific purpose is noted for each function and control structure. 	<ul style="list-style-type: none"> Clearly and effectively documented including descriptions of all variables. Specific purpose is noted for each function, control structure, input requirements, and output results.
Runtime	<ul style="list-style-type: none"> Does not execute due to errors. User prompts are misleading or non-existent. No testing has been completed. 	<ul style="list-style-type: none"> Executes without errors. User prompts contain little information, poor design. Some testing has been completed. 	<ul style="list-style-type: none"> Executes without errors. User prompts are understandable, minimum use of symbols or spacing in output. Thorough testing has been completed 	<ul style="list-style-type: none"> Executes without errors excellent user prompts, good use of symbols, spacing in output. Thorough and organized testing has been completed and output from test cases is included.
Efficiency	<ul style="list-style-type: none"> A difficult and inefficient solution. 	<ul style="list-style-type: none"> A logical solution that is easy to follow but it is not the most efficient. 	<ul style="list-style-type: none"> Solution is efficient and easy to follow (i.e. no confusing tricks). 	<ul style="list-style-type: none"> Solution is efficient, easy to understand, and maintain.

Biology 102 Laboratory Report Assessment Rubric
Scientific Investigation and Experimentation

Level	1. Introduction <i>What is the central research question? What is the purpose of the study?</i>	2. Materials and Methods <i>What is the experimental approach used in this investigation?</i>	3. Results (data and analysis) <i>Does the report clearly describe what was found in the investigation?</i>	4. Discussion and Conclusion <i>Do the results address the central research question/hypothesis in the study?</i>	5. Quality of Writing <i>Is the report informative and easy to read? Is the writing clear and logical?</i>
5	Report provides a brief background (relevant theory and facts) of the study. The scientific question and hypothesis are clearly stated. Predicted results are based on relevant scientific knowledge. Alternative or null hypotheses are also considered.	Brief description of the main organism, chemicals, and/or instruments used in the experiment. Clear and succinct description of the procedure used. Explanation of how variables are controlled, clearly distinguishing dependent and independent variables.	Data and analysis (including diagrams, graphs, and calculations) are well organized. Provides correct interpretation of graphs and clear verbal description of results. Use appropriate graphs to identify trends. Charts and graphs are clearly labeled and include the proper units.	Logical interpretation of what was found in the results and how the results address the central research question. Convincing interpretation, citing evidence. Analysis includes an evaluation of the accuracy and reproducibility of the results. Significance of study in relation to existing scientific knowledge is explained.	Report is clearly written, logical and concise with correct usage of language. References in the text of the report are appropriately used and cited in proper format. Literature cited section is included only those references cited in the text and all references are in the proper format.
4	Statement of the scientific question and hypothesis is clear. The background and predicted results of the study does not refer to all of the relevant theories and facts.	Experimental materials, equipment and procedure are clearly described. No discussion on controlling variables.	Data and analysis are organized, but not enough data is included to address the research question. Uses appropriate graphs to identify trends. Charts and graphs are clearly labeled and include the proper units.	Discussion of results clearly addresses the research question and hypothesis. Uses evidence and logic in arriving at the conclusion. Has clear interpretation of data. Lacks a discussion of the accuracy and reproducibility of the results.	Report is clearly written employing correct usage of language.
3	Background incomplete. Scientific question and hypothesis not clearly stated. Stated hypothesis is not explicitly tested by experiments. Prediction of results is not based on relevant knowledge of subject.	Experimental procedure is summarized with a listing of materials. No discussion on controlling variables.	Data are presented in charts and graphs, but not enough data is included to address the research question. Some graphs are not labeled.	Discussion of results shows understanding of the study, but not its significance. Analysis of results is incomplete. Conclusions are not based on evidence and logic.	Report is occasionally disjointed. Language usage is generally correct.
2	The research question and hypothesis is poorly stated. Stated hypothesis is not testable. The importance of the investigation is not apparent.	Description of the research procedure is too sketchy. Essential materials missing, list of materials includes items that were not used in the investigation. Important elements are missing.	Data and analysis are not clearly presented. Graphs and tables are incomplete or inappropriate (e.g. using a bar graph instead of a line graph, confusing dependent and independent variables)	Discussion does not clearly address the research question and how the results lead to the conclusion. There is no analysis of results. Does not distinguish between evidence and inference.	Writing sometimes lacks clarity. Language usage does not always follow convention.
1	Statement of scientific question and hypothesis shows a lack of understanding of the investigation.	One cannot follow the procedure described.	Diagrams, tables, graphs are confusing or incomplete.	Shows lack of understanding of the investigation and the scientific concepts underlying it.	Report is difficult to follow with misspelled words and misuse of scientific terms.

Example of a Rubric and its use for improvement

<p align="center">Example Rubric for Scientific Experiment in Biology Capstone Course by Virginia Johnson Anderson, Towson University (From Walvoord and Anderson, <i>Effective Grading: A Tool for Learning and Assessment</i>, 1998, pp. 197-201)</p>					
<p>Task Assignment: Semester-long assignment to design an original experiment, carry it out, and write it up in scientific report format. Students are to determine which of two brands of a commercial product (e.g. two brands of popcorn) are "best." They must base their judgment on at least four experimental factors (e.g. "% of kernels popped" is an experimental factor. Price is not, because it is written on the package).</p>					
	5	4	3	2	1
Title	Is appropriate in tone and structure to science journal; contains necessary descriptors, brand names, and allows reader to anticipate design.	Is appropriate in tone and structure to science journal; most descriptors present; identifies function of experimentation, suggests design, but lacks brand names.	Identifies function, brand name, but does not allow reader to anticipate design.	Identifies function or brand name, but not both; lacks design information or is misleading	Is patterned after another discipline or missing.
Introduction	Clearly identifies the purpose of the research; identifies interested audiences(s); adopts an appropriate tone.	Clearly identifies the purpose of the research; identifies interested audience(s).	Clearly identifies the purpose of the research.	Purpose present in Introduction, but must be identified by reader.	Fails to identify the purpose of the research.
Scientific Format Demands	All material placed in the correct sections; organized logically within each section; runs parallel among different sections.	All material placed in correct sections; organized logically within sections, but may lack parallelism among sections.	Material placed in right sections but not well organized within the sections; disregards parallelism.	Some materials are placed in the wrong sections or are not adequately organized wherever they are placed.	Material placed in wrong sections or not sectioned; poorly organized wherever placed.
Materials and Methods Section	Contains effective, quantifiable, concisely-organized information that allows the experiment to be replicated; is written so that all information inherent to the document can be related back to this section; identifies sources of all data to be collected; identifies sequential information in an appropriate chronology; does not contain unnecessary, wordy descriptions of procedures.	As 5, but contains unnecessary information, and/or wordy descriptions within the section.	Presents an experiment that is definitely replicable; all information in document may be related to this section; however, fails to identify some sources of data and/or presents sequential information in a disorganized, difficult pattern.	Presents an experiment that is marginally replicable; parts of the basic design must be inferred by the reader; procedures not quantitatively described; some information in Results or Conclusions cannot be anticipated by reading the Methods and Materials section.	Describes the experiment so poorly or in such a nonscientific way that it cannot be replicated.
Non-experimental Information	Student researches and includes price and other non-experimental information that would be expected to be significant to the audience in determining the better product, or specifically states non-experimental factors excluded by design; interjects these at appropriate positions in text and/or develops a weighted rating scale; integrates non-experimental information in the Conclusions.	Student acts as above, but is somewhat less effective in developing the significance of the non-experimental information.	Student introduces price and other non-experimental information, but does not integrate them into Conclusions.	Student researches and includes price effectively; does not include or specifically exclude other non-experimental information.	Student considers price and/or other non-experimental variables as research variables; fails to identify the significance of these factors to the research.
Designing an Experiment	Student selects experimental factors that are appropriate to the research purpose and audience; measures adequate aspects of these selected factors; establishes discrete subgroups for which data significance may vary; student demonstrates an ability to eliminate bias from the design and bias-ridden statements from the research; student selects appropriate sample size, equivalent groups, and statistics; student designs a superior experiment.	As 5, but student designs an adequate experiment.	Student selects experimental factors that are appropriate to the research purpose and audience; measures adequate aspects of these selected factors; establishes discrete subgroups for which data significance may vary; research is weakened by bias OR by sample size of less than 10.	As 3, but research is weakened by bias AND inappropriate sample size	Student designs a poor experiment.

Example Rubric for Scientific Experiment in Biology Capstone Course

by Virginia Johnson Anderson, Towson University

(From Walvoord and Anderson, *Effective Grading: A Tool for Learning and Assessment*, 1998, pp. 197-201)

Task Assignment: Semester-long assignment to design an original experiment, carry it out, and write it up in scientific report format. Students are to determine which of two brands of a commercial product (e.g. two brands of popcorn) are "best." They must base their judgment on at least four experimental factors (e.g. "% of kernels popped" is an experimental factor. Price is not, because it is written on the package).

	5	4	3	2	1
Defining Operationally	Student constructs a stated comprehensive operational definition and well-developed specific operational definitions.	Student constructs an implied comprehensive operational definition and well-developed specific operational definitions.	Student constructs an implied comprehensive operational definition (possible less clear) and some specific operational definitions.	Student constructs specific operational definitions, but fails to construct a comprehensive definition.	Student lacks understanding of operation definition.
Controlling Variables	Student demonstrates, by written statement, the ability to control variables by experimental control and by randomization; student makes reference to, or implies, factors to be disregarded by reference to pilot or experience; superior overall control of variables.	As 5, but student demonstrates an adequate control of variables.	Student demonstrates the ability to control important variables experimentally; Methods and Materials section does not indicate knowledge of randomization and/or selected disregard of variables.	Student demonstrates the ability to control some, but not all, of the important variables experimentally.	Student demonstrates a lack of understanding about controlling variables.
Collecting Data and Communicating Results	Student selects quantifiable experimental factors and/or defines and establishes quantitative units of comparison; measures the quantifiable factors and/or units in appropriate quantities or intervals; student selects appropriate statistical information to be utilized in the results; when effective, student displays results in graphs with correctly labeled axes; data are presented to the reader in text as well as graphic forms; tables or graphs have self-contained headings.	As 5, but the student did not prepare self-contained headings for tables or graphs.	As 4, but data reported in graphs or tables contain materials that are irrelevant, and/or not statistically appropriate.	Student selects quantifiable experimental factors and/or defines and establishes quantitative units of comparison; fails to select appropriate quantities or intervals and/or fails to display information graphically when appropriate.	Student does not select, collect, and/or communicate quantifiable results.
Interpreting Data: Drawing Conclusions/Implications	Student summarizes the purpose and findings of the research; student draws inferences that are consistent with the data and scientific reasoning and relates these to interested audiences; student explains expected results and offers explanations and/or suggestions for further research for unexpected results; student presents data honestly, distinguishes between fact and implication, and avoids over-generalizing; student organizes non-experimental information to support conclusion; student accepts or rejects the hypothesis.	As 5, but student does not accept or reject the hypothesis.	As 4, but the student over-generalizes and/or fails to organize non-experimental information to support conclusions.	Student summarizes the purpose and findings of the research; student explains expected results, but ignores unexpected results.	Student may or may not summarize the results, but fails to interpret their significance to interested audiences.

Applying this rubric to student capstone course work resulted in scores showed a need for improvement in the *Design of Experiments* and in *Defining Operationally*.

Student Scores for Science Reports Before and After Anderson Made Pedagogical Changes (From Walvoord and Anderson, <i>Effective Grading: A Tool for Learning and Assessment</i> , 1998, p. 147)		
Trait	Before	After
Title	2.95	3.22
Introduction	3.18	3.64
Scientific Format	3.09	3.32
Methods and Materials	3.00	3.55
Non-Experimental Info	3.18	3.50
Designing the Experiment	2.68	3.32
Defining Operationally	2.68	3.50
Controlling Variables	2.73	3.18
Collecting Data	2.86	3.36
Interpreting Data	2.90	3.59
<i>Overall</i>	<i>2.93</i>	<i>3.42</i>

After improving the course material an improvement was seen in the following year application of the rubric.