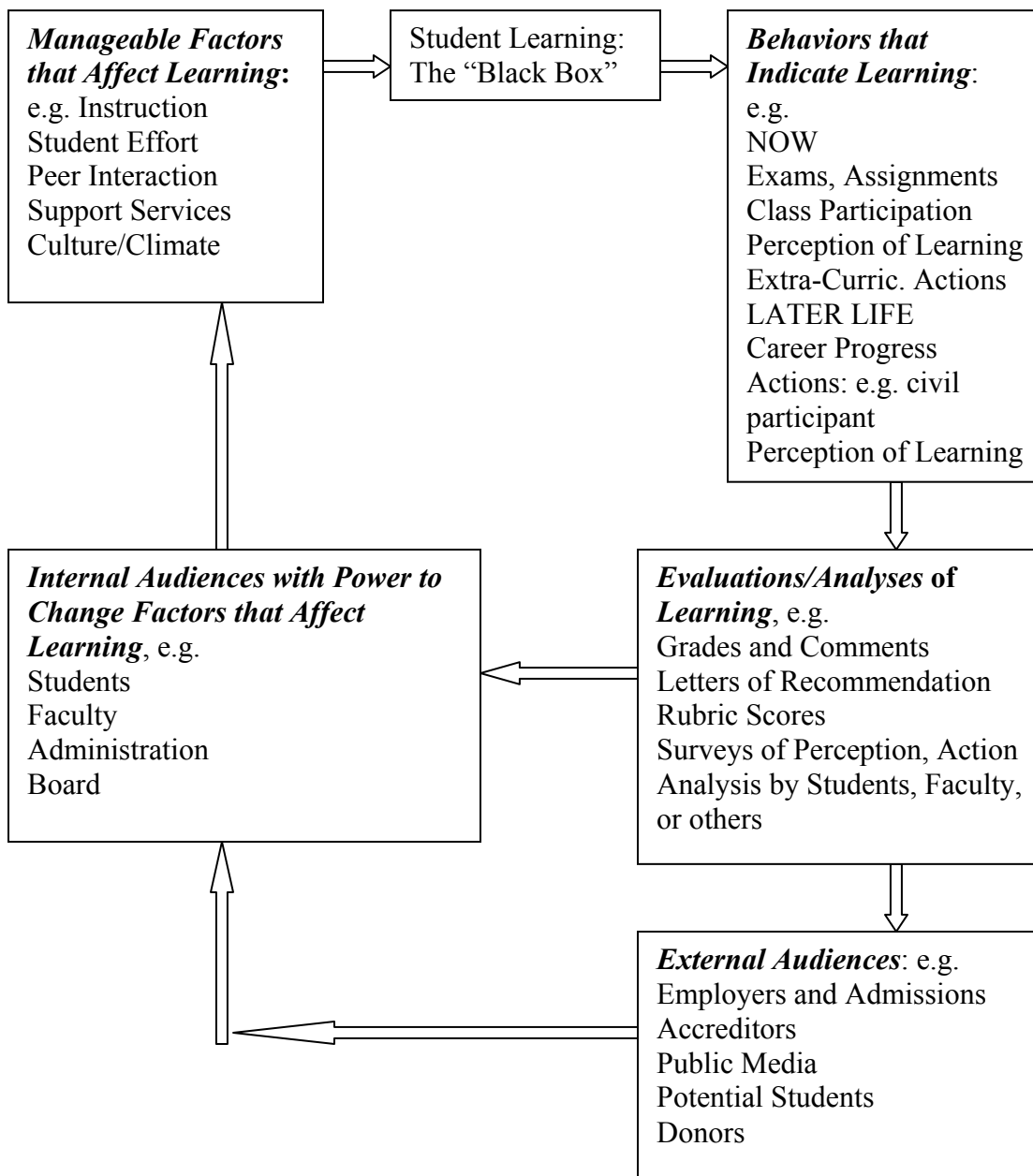

Practical and Feasible Ways to Improve Student Learning in the Department/Program

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The Ideal System for Information-Gathering and Improvement of Student Learning

In the Ideal System:

1. Exams, assignments, and classroom participation are valid indicators of the actual learning that the teacher desires
2. Evaluations/analyses accurately reflect learning and are appropriately diagnostic and explicit for their purposes
3. The system promotes healthy motivation and fair treatment at every level
4. Evaluations/analyses are communicated appropriately to their various audiences and serve their purposes
5. The system is efficient: no valuable information is lost; no useless information is communicated
6. The system is sustainable in terms of time and resources
7. Appropriate autonomy is preserved at each point

Practical, Feasible Steps for Departments/Program/Gen Ed

1. Formulate Learning Goals for Each Track/Program

Format: When students leave our [major, major track, gen ed course/program], we want them to be able to _____

Arriving at the goals: several methods

- Each faculty member submits his/her course goals and a departmental/ gen ed committee integrates them into a single list which the unit then discusses and amends as needed.
- OR Goals are derived from professional disciplinary sources and/or college competencies
- OR Goals are formulated by a faculty committee, and each faculty member is asked to derive his/her course goals from the central goals

2. Check Where the Goals are being Taught and Assessed

One method for addressing the question is a grid that is passed around among department members or those teaching gen ed. It lists each learning goal and then asks the faculty to indicate, for each course they teach, whether they are teaching toward that goal and whether they are assessing it through classroom exams, projects, and the like.

Goal	101	102	201	202	etc. (including internship or extra- curricular activities
Goal # 1 [e.g.: describe and apply basic biological information and concepts]					
Goal #2: [stated]					
Goal #3 [stated]					
Goal #4 [stated]					

Each faculty member marks, for his/her own courses:

TH: I teach this at a high level of emphasis

TL: I teach this at a low level of emphasis

AH: I assess this at a high level of emphasis

AL: I assess this at a low level of emphasis

Or leaves the cell blank to indicate they are not working on that goal

A department member or committee synthesizes these reports and identifies goals that are not being addressed, or addressed in questionable sequence, throughout the student's curriculum. The examination of what is being taught, in what sequence, and at what level of complexity, may itself lead to curricular change.

The grid reveals where student learning is already being assessed, usually through graded work, in ways that may be useful to the department if the faculty members who are doing the assessment will share what they are discovering about student learning.

When selecting strategies and instruments for assessing student learning, my advice is to use student classroom work whenever possible. Such work is already being graded, so there is little added work. The assessment is made within the context of learning—one of the principles of good assessment included in recommendations by the American Assn. for Higher Education and other experts (for a copy of the AAHE recommendations, see Walvoord and Anderson,

Effective Grading: A Tool for Learning and Assessment, p. 189-191, or contact AAHE at www.aahe.org).

3. Determine How Well Students Are Meeting the Goals

Methods may be direct or indirect.

Direct Assessment Requires:

<ul style="list-style-type: none">• Performance by student• Criteria to evaluate the performance• Analysis of the data	Any of these may be generated at <ul style="list-style-type: none">• Classroom• Department• Institution• External
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Examples of Direct Assessment:

- Classroom assignments/exams/projects evaluated by specific criteria. Faculty members evaluate these student works and report students' strengths and weaknesses to the department for discussion and action. For example, faculty teaching a senior seminar may report to the department areas of strength and weakness of the students as they enter the seminar and as they leave it. The department may decide on changes to curriculum prior to the seminar, and/or the seminar teacher(s), with their colleagues' help and encouragement, may decide to try various pedagogical changes to help students within the seminar.
- A departmental exam administered to all students or a representative sample or students
- A national standardized exam
- Direct observation of students' performance on the job, either by university staff or by employers
- A departmental "show" of art work, drama, music, research projects, engineering projects, etc., evaluated by judges either external or internal to the department
- Faculty Reports on Student Learning: example:

Completed by each instructor for each course, before the course begins:

Learning Outcome # (refer to learning outcomes list)	Brief description of how learning outcome is addressed in the course materials and information provided to students (e.g. readings, lecture, multimedia, field trips, etc.)	Brief description of work performed by students that will demonstrate or assess the learning outcome (e.g. exams, homework, projects, laboratories, etc.)	List of material that will be collected to evidence the learning outcome: one example of outstanding work, one of typical passing work. Specify how collected work related to this outcome.

Completed by each instructor, for each course, after the semester is over:

Learning Outcome # (should correspond with pre-semester form you submitted)	Identify strengths and weaknesses in your teaching methods for course materials related to this goal?	Indicate strengths and weaknesses in student achievement of the learning outcome	What changes, if any, do you plan for next time you teach this course, to improve student learning?	What actions can the department take to improve student weaknesses you identified?

4. Use the Information for Improvement

Option #1

Annual meeting of department/program faculty, in which the teachers of capstone or other key courses present rubrics such as those above that show aggregated student performance on key learning goals for the department/program.

Department/program faculty fulfill these roles in the meeting:

1. Encourage the faculty member reporting
2. Take whatever action is required for improvement at the unit level
3. Request action at higher levels as needed
4. Report the assessment processes and outcomes to administration, accreditors, etc.

Option #2

A committee reviews individual course reports and brings a summary and recommendations to the department/program

Option #3

An outside body samples classroom data and reports to the department/program

Examples of the Three Steps: Department/Program/Gen Ed Assessment Plans

Example #1: Majors, Department of Biology

(Note: similar matrices would be produced for general-education and graduate programs in the department)

Learning Goals for Majors

1. Describe and apply basic biological information and concepts
2. Conduct original biological research and report results orally and in writing to scientific audiences
3. Apply ethical principles of the discipline in regard to human and animal subjects, environmental protection, use of sources, and collaboration with colleagues

Are these on the web or otherwise readily available to students and faculty? _____

<i>Measures</i>	<i>Goal 1</i>	<i>Goal 2</i>	<i>Goal 3</i>	<i>Use of the information</i>
Standardized test given to all seniors AND Final exams of three basic biology courses required of all majors	X			Data are reported to the department annually by the standardized exam committee and the instructors of the three basic courses. The department supports and encourages the instructors, takes any appropriate department-level actions, and reports meeting outcomes to dean or other body which has resources to address problems, and to those composing reports for accreditation or other external audiences. All data are reviewed as part of program review every seven years.
In senior capstone course, students complete an original scientific experiment, write it up in scientific report format, and also make an oral report to the class. The instructor(s) use explicit criteria to	X	X	X	Annually, the senior capstone instructor(s) share students' scores with the department. The department takes action as above.

<i>Measures</i>	<i>Goal 1</i>	<i>Goal 2</i>	<i>Goal 3</i>	<i>Use of the information</i>
evaluate student work.				
Alumni survey asks how well alums thought they learned to conduct and communicate scientific research		X	X	Data reviewed annually by department for action, as above
Sample of regional employers gathered two years ago to reflect how well our majors are doing and give advice to dept.	X	X	X	Data reviewed by department for action, as above

Examples of Changes Based on Assessment

- Two years ago, our advisory council of regional employers recommended that our majors had a good level of biological knowledge but needed stronger skills in actually conducting biological research. Data from the alumni survey also mentioned this problem. We instituted the required capstone course, which requires students to conduct original scientific research, and we asked the instructor(s) annually to report to the department on student research and communication skills demonstrated by their capstone projects. In three years, when several cohorts of majors have passed through the capstone, we will again survey alumni and employers to see whether student skills have increased, and we will review data from all years of the capstone projects.
- The capstone instructor(s) last year reported low graphing skills in seniors; we arranged with the mathematics department for greater emphasis on graphing in the required math course and for assessment of graphing skills during that course, working closely with the capstone instructor(s). The capstone instructor(s) will report next year whether graphing skills are stronger. Prof. Brody is currently developing a rubric to assess graphing skills more systematically.

Recommendations for Improving Assessment Processes

- Standardized national test is costly and time-consuming to administer, has low student motivation in its current format, and results are difficult to map to our curriculum. Committee should review usefulness of the national test.

Example #2: General Education Course (Core Literature), Department of English

Learning Goals for Sophomore Core Literature Course (General Education)

1. During and after the course, students will read literature for pleasure
2. Students will write a literary-critical essay demonstrating ability to use the techniques of literary analysis they have been taught in the class and to acknowledge alternative interpretations
3. Students will reflect thoughtfully on their own ideas and values, in response to works of literature

Are these on the web or otherwise readily available to faculty and students? _____

Measures	Goal 1	Goal 2	Goal 3	Use of information
In all Core Lit courses, instructors assign an essay requiring students to apply literary critical methods to literature and to acknowledge alternative interpretations. They evaluate students' essays by explicit written criteria.	X			In annual meeting, Core Lit instructors report student scores to their colleagues, who: <ul style="list-style-type: none"> - Collegially support the instructor's plans for improvement - Take appropriate action if needed at the department level - Report results of the meeting to dean or other body with budgetary resources if needed, and to Gen Ed committee. Aggregated scores are part of program review every five years.
Each Core Lit course requires at least three 2-4-page journal entries in which students reflect the impact of the literature they read on their own thinking and values. Instructors evaluate the journals using a rubric. Instructors report the percent of student journals that make thoughtful		X		In an annual meeting, instructors share their evaluations of the journals and strategies for encouraging more reflective and thoughtful journals. Aggregated data are part of program review every five

Measures	Goal 1	Goal 2	Goal 3	Use of information
links.				years.
<p>Survey administered to students at the end of each Core Lit class, asking whether, during that semester, they have read literature not required for class.</p> <p>Student survey administered by Institutional Research to all seniors asking whether they have read books not required in class.</p>			X	Results reported annually to the department for discussion and action. Aggregated data are part of program review every five years.

Examples of Changes Based on Assessment

1. Minutes from the meetings on journals show that instructors express their intentions to adopt strategies they have heard in the meetings, and report having done so. Percent of journals that make thoughtful links has risen in the past three years from 47% to 68%.

Recommendations for Improving Assessment Processes

2. Our goal is that students will form a lifelong habit of reading literature for pleasure. Yet we have data only on the Core Lit course and senior students. High rates of student employment and family responsibility at our institution mean that students' discretionary reading time is exceptionally limited during the college years. Could Institutional Research add a question to the next alumni survey asking whether alums have, in the past year, read a novel, poem, or short story, or attended a live drama performance, not required for academic credit?

Example #3: Ph.D. Program, Department of Sociology

Learning Goals for Ph.D. Students

1. Produce publishable research in the field
2. Follow ethical principles of the discipline for using sources, human subjects, and working with colleagues
3. For those bound for college teaching: teach effectively

Measures	Goal 1	Goal 2	Goal 3	Use of Information
Annually, Graduate Faculty meet to assess each graduate student's progress to degree and the quality of his/her course work, qualifying exam, and dissertation. At the end of the meeting, faculty discuss issues that affect graduate students as a group. Minutes are kept.	X	X	X	Graduate Studies Committee uses the minutes to take action or to shape recommendations to the Graduate Faculty or the department as a whole. Aggregated data are part of program review every 8 yrs
Graduate student publications and conference presentations (collected by Grad School and by departmental advisors)	X	X		Reviewed annually by Director of Graduate Studies and presented to Graduate Faculty for action as needed. Aggregated data are part of program review every 8 yrs
Job Placement	X	X	X	"
501, Research Methods: exam questions test students' knowledge of ethical principles and their application to sample cases		X		501 instructor(s) report results to Director of Graduate Studies, who presents to Graduate Faculty for action as needed. Aggregated data are part of program review every 8 yrs.
630, Teaching Sociology: students prepare syllabi, give lectures, lead discussions. Instructor evaluates these with a rubric.			X	"
Student exit interviews conducted by Graduate School	X	X	X	Grad School reports results for soc students to Director of Graduate Studies, who presents to Graduate Faculty for action as needed. Aggregated data

Measures	Goal 1	Goal 2	Goal 3	Use of Information
				are part of program review every 8 yrs
A faculty member visits the classroom of every teaching assistant at least twice a semester and prepares a written analysis of the quality of teaching, using a departmental rubric.			X	Faculty visitors report annually to the department for action as needed. Aggregated data are part of program review every 8 yrs

Examples of Changes Based on Assessment

- Based on departmental dissatisfaction with the publication rate of graduate students, a new graduate course, “Publishing in Sociology,” was added three years ago, which has resulted in a 3-fold increase in the number of graduate student publications in refereed journals
- In response to graduate student exit interviews requesting teaching experience with different kinds of students, two teaching internships per year were developed for students to teach sociology in a nearby community college and a small liberal arts college.

Recommendations for Improving Assessment Processes

- Faculty visitation to T.A. classes is not occurring as regularly as it should. Faculty complain that the rubric is not adequate. Committee should review this entire assessment procedure and recommend changes by next Fall.

Example #4: Majors in Economics Department, Including Assessment Data

Note: This report includes actual data from the assessment measures during the year the report was prepared. The Assessment Committee thus undertook BOTH of the possible tasks: analyzing assessment processes for recommendations about improving those processes AND analyzing assessment data for recommendations about student learning. Because the department presents actual data, it uses a slightly different format, showing the goals first, then the assessment method and the results for each goal. This report is adapted from an assessment report prepared by Professor Philip Way for the Department of Economics at the University of Cincinnati.

Measures of Student Learning for B.A. in Economics, B.A. in Business Economics

- Survey of alumni, conducted with help of the Office of Institutional Research
- Focus groups of current students, who met for an hour with the assistant chair
- Analysis of the senior capstone research projects evaluated according to the faculty members' criteria
- Audit of transcripts of majors to determine which courses they took and in which sequences

Goals, Assessment Methods, and Findings

1. Critical thinking (analytical) and communication skills, to enable undergraduate students to think and communicate like economists (in other words, to become skilled in the logic and rhetoric of economics)
 - A. The use of mathematical methods to represent economic concepts and to analyze economic issues
 - Surveys: Average rating of 4.33 (helped somewhat) on a five-point scale (1-5). Achievement of this objective is rated 4th out of 12 objectives.
 - Focus Groups: Amount of math varies among classes—maybe calculus should be required.
 - Capstone: papers and presentations: none included math.
 - B. To represent economic relationships in terms of theoretical models
 - Surveys: Average rating of 4.33 (helped somewhat). Ranked 4 out of 12.
 - Focus Groups: Achievement is aided by having TA sessions. Good foundation if taken before other courses.
 - Capstone: models used in papers and presentation with reasonable success.
 - C. To gather economic data pertinent to economic theories in order to analyze economic questions
 - Surveys: Average rating of 4.17 (helped somewhat). Ranked 7 out of 12.
 - Focus Groups: Library research used in a few classes only.
 - Capstone: students showed an ability to collect data but over-relied on the web.
 - D. To use statistical methods to analyze economic questions
 - Surveys: Average rating of 3.83 (helped somewhat). Ranked 10 of 12.
 - Focus Groups: Limited exposure. Complaint about book used.
 - Capstone: Little evidence of statistical methods.

- E. To use statistical computer software to analyze economic issues
 - Surveys: Average rating of 3.33 (no effect one way or the other). Ranked 12 of 12.
 - Focus Groups: Concern that software used in career will be different.
 - Capstone: Little evidence of use.
- F. To express economic ideas succinctly and professionally in writing
 - Surveys: Average rating of 4.17 (helped somewhat). Ranked 7 of 12.
 - Focus Groups: Writing required more than speaking. In particular, research papers required in 558 and 575.
 - Capstone: Writing skills of students generally acceptable, but not “very good” or “excellent.”
- G. To express economic ideas succinctly and professionally orally.
 - Surveys: Average rating of 4.5 (helped somewhat/significantly). Ranked 2 of 12.
 - Focus Groups: Most courses do not involve oral communication, although it would be useful after graduation in the workforce. One idea was a sequence of courses in communication as part of the Arts and Sciences college requirements. More discussion and presentations were advised.
 - Capstone: Presentations revealed a lack of training in how to present, as well as nervousness.

2. Content: To master key economic concepts and fields and to understand how the field works in practice, and what economists do.

- A. To master key economics concepts
 - Surveys: Average rating of 4.5 (helped significantly). Ranked 2 of 12.
 - Focus Groups: no complaints.
- B. To understand economics in general, and at least two fields of economics in depth (one field for Business Economics)
 - Surveys: Average rating of 4.33 (helped somewhat). Ranked 4 of 12.
 - Focus Groups: Students like being able to choose what interests them. Exposure to a variety was said to be helpful. Business Economics students appear to have more diverse training.
 - Audits: [report presents the courses actually taken by majors, and their sequence]
- C. To understand international economics and economic development
 - Surveys: Average rating of 4.0 (helped somewhat). Ranked 9 of 12.
 - Focus Groups: Students like this recommendation – useful.
 - Audits: The average student completes 2.3 courses in international/development.
- D. To understand how the economy works in practice and what economists do
 - Surveys: Average ratings of 4.67 (helped significantly) in Economics and 3.67 (helped somewhat) in Business Economics. Ranked 1 of 12 and 11 of 12.
 - Focus Groups: Students like having guest speakers in class. At present, few think they know what economists do. Some advocated a broader co-op program.

Capstone: Students exposed to several speakers who are economists. Learned what they do.

Recommendations for Student Learning

Main weaknesses are in:

- Achievement of learning goals related to statistical methods and software
- Knowledge about what economists do

Survey indicated that the program did not facilitate exposure to international and development economics, but data from focus groups and course audits showed otherwise. No changes were therefore made.

Steps taken:

- Last year introduced pre-major course (Computer and Data Resources in Economics) for better preparation in statistical methods and software.
- Capstone course changed to provide more information about what economists do.

Recommendations for Assessment Processes

- Surveys of recent graduates: A low response rate (20%) continues to be a concern. While we prefer to delay sending out the surveys because we wish to learn of students' new positions, it may be better to mandate that students complete them before graduation.
- Focus Groups: These have proven to be a source of rich, detailed data. The time cost is small. We will continue them.
- Course audits: These are easy to do because we have graduation checklists in place that we use for verifying eligibility for graduation. We will continue to do these audits. Limitation: they tell us what students were exposed to, not necessarily what they learned or remember.
- Capstone: The capstone is intended to achieve many of the program goals. It is easy to rate student work products in terms of the objectives. Limitation: the students are not graded on whether they achieve all the program goals—for example, they do not have to use statistical software, but they might choose to.

Example: General-Education Assessment Matrix

General-Education Learning Goals

1. To demonstrate the habit of reflective self-assessment aimed at developing self-knowledge, taking responsibility for one’s own learning, monitoring one’s intellectual and personal growth, and acting thoughtfully on one’s beliefs
2. To participate competently in academic and civic discourse by writing and speaking effectively, by thinking critically and imaginatively, by conducting purposeful inquiry, and by using appropriate technological tools for research and analysis
3. To understand key concepts, perspectives, and methods in philosophy, religious studies, and mathematics and in representative disciplines in the natural sciences, the social sciences, and the humanities
4. To integrate and consolidate knowledge and learning from various Core courses, co-curricular experiences, and courses in the major into a world view that is open to new ideas and persons, understands diversity and multicultural perspectives, and tolerates ambiguity
5. To articulate one’s vision of social and environmental justice, to assess one’s own personal commitment to justice, and to demonstrate actions taken to ameliorate in justice and to promote a better world
6. To demonstrate the ability to work with and for others; to translate beliefs, thoughts, values and commitments into action, thereby becoming responsibly empowered in the world

Matrix Showing Classroom-Based and Institution-Wide Assessment of Gen Ed Goals

Assessment Measure (office where data originate)	Goal 1	2	3	4	5	6	How data are used for improvement
Senior student questionnaire (Institutional Research)	X	X		X		X	Results reported to officers, strategic planning committee, Core Assessment Committee, and Faculty Senate
Alumni questionnaire (Institutional Research)	X	X	X	X	X	X	As above
Core Goals questionnaire annually to all students in selected Core courses	X	X	X	X	X	X	Reviewed annually by Core Assessment Committee and Senior Synthesis faculty. Reported to officers, strategic planning committee, Core Assessment Committee, and Faculty Senate
Analysis of 1	X	X	X	X	X	X	Annual meetings by discipline of all

Assessment Measure (office where data originate)	Goal 1	2	3	4	5	6	How data are used for improvement
student assignment in each Core curriculum class, using an instructor-generated rubric based on Core goals							faculty teaching Core curriculum, to share instructor analysis of students' strengths and weaknesses. Followed by discussion of pedagogical strategies. Written report and recommendations sent to Core Assessment Committee.

Recommendations for Improvement in Assessment Processes

1. Work with Institutional Research to determine whether student and alumni survey data, could be more specific to individual departments and courses and if so, how to manage and fund the dis-aggregation and distribution of those data
2. More guidance for the discipline-based faculty meetings.
3. Fund an annual workshop for Gen Ed faculty, especially new faculty, to re-affirm Gen Ed goals and discuss appropriate course design and pedagogy. Every four years, fund a week-long summer workshop, with stipends to the faculty, for an expanded version of the workshop, with the same purpose.

Rubrics for Evaluating Student Classroom Work

Example #1: Rubric for Scientific Experiment in Biology Capstone Course

by Virginia Johnson Anderson, Towson University, Towson, MD

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).

Title

- 5 - Is appropriate in tone and structure to science journal; contains necessary descriptors, brand names, and allows reader to anticipate design.
- 4 - Is appropriate in tone and structure to science journal; most descriptors present; identifies function of experimentation, suggests design, but lacks brand names.
- 3 - Identifies function, brand name, but does not allow reader to anticipate design.
- 2 - Identifies function or brand name, but not both; lacks design information or is misleading
- 1 - Is patterned after another discipline or missing.

Introduction

- 5 - Clearly identifies the purpose of the research; identifies interested audiences(s); adopts an appropriate tone.
- 4 - Clearly identifies the purpose of the research; identifies interested audience(s).
- 3 - Clearly identifies the purpose of the research.
- 2 - Purpose present in Introduction, but must be identified by reader.
- 1 - Fails to identify the purpose of the research.

Scientific Format Demands

- 5 - All material placed in the correct sections; organized logically within each section; runs parallel among different sections.
- 4 - All material placed in correct sections; organized logically within sections, but may lack parallelism among sections.
- 3 - Material placed in right sections but not well organized within the sections; disregards parallelism.
- 2 - Some materials are placed in the wrong sections or are not adequately organized wherever they are placed.
- 1 - Material placed in wrong sections or not sectioned; poorly organized wherever placed.

Materials and Methods Section

- 5 - 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.
- 4 - As above, but contains unnecessary information, and/or wordy descriptions within the section.

- 3 - 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.
- 2- 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.
- 1 - Describes the experiment so poorly or in such a nonscientific way that is cannot be replicated.

Non-experimental Information

- 5 - Student researches and includes price and other nonexperimental 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 nonexperimental information in the Conclusions.
- 4 - Student acts as above, but is somewhat less effective in developing the significance of the non-experimental information.
- 3 - Student introduces price and other non-experimental information, but does not integrate them into Conclusions.
- 2 - Student researches and includes price effectively; does not include or specifically exclude other non-experimental information.
- 1 - 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

- 5 - 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.
- 4 - As above, but student designs an adequate experiment.
- 3 - 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.
- 2 - As above, but research is weakened by bias AND inappropriate sample size
- 1 - Student designs a poor experiment.

Defining Operationally

- 5 - Student constructs a stated comprehensive operational definition and well-developed specific operational definitions.
- 4 - Student constructs an implied comprehensive operational definition and well-developed specific operational definitions.
- 3 - Student constructs an implied comprehensive operational definition (possible less clear) and some specific operational definitions.

- 2 - Student constructs specific operational definitions, but fails to construct a comprehensive definition.
- 1 - Student lacks understanding of operation definition.

Controlling Variables

- 5 - 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.
- 4 - As above, but student demonstrates an adequate control of variables.
- 3 - 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.
- 2 - Student demonstrates the ability to control some, but not all, of the important variables experimentally.
- 1 - Student demonstrates a lack of understanding about controlling variables.

Collecting Data and Communicating Results

- 5 - 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.
- 4 - As 5 above, but the student did not prepare self-contained headings for tables or graphs.
- 4 - As 4 above, but data reported in graphs or tables contain materials that are irrelevant and/or not statistically appropriate.
- 2 - 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.
- 1 - Student does not select, collect, and/or communicate quantifiable results.

Interpreting Data: Drawing Conclusions/Implications

- 5 - 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 overgeneralizing; student organizes non-experimental information to support conclusion; student accepts or rejects the hypothesis.
- 4 - As 5 above, but student does not accept or reject the hypothesis.
- 3 - As 4 above, but the student overgeneralizes and/or fails to organize non-experimental information to support conclusions.
- 2 - Student summarizes the purpose and findings of the research; student explains expected results, but ignores unexpected results.
- 1 - Student may or may not summarize the results, but fails to interpret their significance to interested audiences.

Student Scores on PTA for Science Reports, Before and After Anderson Made Pedagogical Changes

Trait	Before	After
<u>Title</u>	<u>2.95</u>	<u>3.22</u>
<u>Introduction</u>	<u>3.18</u>	<u>3.64</u>
<u>Scientific Format</u>	<u>3.09</u>	<u>3.32</u>
<u>Methods and Materials</u>	<u>3.00</u>	<u>3.55</u>
<u>Non-Experimental Info</u>	<u>3.18</u>	<u>3.50</u>
<u>Designing the Experiment</u>	<u>2.68</u>	<u>3.32</u>
<u>Defining Operationally</u>	<u>2.68</u>	<u>3.50</u>
<u>Controlling Variables</u>	<u>2.73</u>	<u>3.18</u>
<u>Collecting Data</u>	<u>2.86</u>	<u>3.36</u>
<u>Interpreting Data</u>	<u>2.90</u>	<u>3.59</u>
<u>Overall</u>	<u>2.93</u>	<u>3.42</u>

(From Walvoord and Anderson, *Effective Grading: A Tool for Learning and Assessment*, 1998, pp. 197-201, 147).

Example: Rubric for Journals in English Literature

Connecting literature to students' own lives and values

1. Journal entry merely summarizes the literature OR merely reflects on the student's own life and values
2. Journal entry summarizes the literature AND reflects on the student's life and values, but makes little or no explicit connection between the two
3. Entry uses the literature in a very simple way to draw "lessons" to apply to the student's own life
4. Entry makes thoughtful links between the literature and the student's own life and values. It uses the literature as a vehicle for pushing and exploring the student's own life and values. It recognizes the complexity both of the literary work and of life and values.

Resources

The Short List

- Walvoord, B. E. *Assessment Clear and Simple: A Practical Guide for Institutions, Departments, and General Education*. Jossey-Bass, 2004. In 79 pages plus appendices, I try to give institutions, departments, and gen ed programs all they will need.
- Palomba, C. A., and Banta, T.W., eds. *Assessing Student Competence in Accredited Disciplines: Pioneering Approaches to Assessment in Higher Education*. Sterling, VA: Stylus Publishing, LLC, 2001. At 350 pages, it gives more extensive details on many of the subjects covered in this volume, and it is organized as a manual of advice to practitioners. The single most useful reference as an accompaniment to Walvoord's short guide.
- Banta, T. W., Lund, J. P., Black, K. E., and Oblander, F. W. *Assessment in Practice: Putting Principles to Work on College Campuses*. San Francisco: Jossey-Bass, 1996. Contains 82 case studies of best practice, each in 2-3 pages. Though now nine years old, still a wealth of practical ideas. 350 pages.
- Walvoord and Anderson, 1998. Walvoord, B. E., and Anderson, V. J. *Effective Grading: A Tool for Learning and Assessment*. San Francisco: Jossey-Bass, 1998. Shows how the classroom grading process can be enhanced and how it can be used for assessment. Helps classroom teachers make the grading process fair, time-efficient, and conducive to learning. Contains a case study of how a community college used the grading process for general-education assessment.
- Maki, P. *Assessing for Learning: Building a Sustainable Commitment Across the Institution*.
- Suskie, L. *Assessing Student Learning: A Common Sense Guide*. Anker, 2004.
- Web pages and publications of your regional accreditor

Additional Resources

- Astin, A. W. *Assessment for Excellence: The Philosophy and Practice of Assessment and Evaluation in Higher Education*. American Council on Education Series on Higher Education. Phoenix: Oryx Press, 1993. A thoughtful treatment of the values and theoretical frameworks behind various assessment practices, as well as very practical advice about gathering and interpreting data, from one of the most respected higher education researchers.
- Banta, T. W. & Associates. *Building a Scholarship of Assessment*. San Francisco: Jossey-Bass, 2002. Essays by leaders in the field, addressing practical issues, but focusing on developing a "scholarship of assessment." Bibliography provides recent references to more specialized works on designing and selecting assessment instruments and other topics. 300 pages.

- Huba, M. E., and Freed, J. E. *Learner-Centered Assessment on College Campuses: Shifting the Focus from Teaching to Learning*. Needham Heights, MA.: Allyn & Bacon, 2000.
- Lucas, A.F., and Associates. *Leading Academic Change: Essential Roles for Department Chairs*. San Francisco: Jossey-Bass, 2000. Collection of essays on leading change in departments. Essays by Gardiner and Angelo are especially valuable for guiding assessment.
- Messick, S. J., ed. *Assessment in Higher Education: Issues of Access, Quality, Student Development, and Public Policy*. Mahwah, NJ: Lawrence Erlbaum Associates, 1999. Places assessment in broader social and political contexts.
- Nichols, J. L. *Assessment Case Studies: Common Issues in Implementation with Various Campus Approaches to Resolution*. New York: Agathon Press, 1995. Nichols, J.O. *The Departmental Guide and Record Book for Student Outcomes Assessment and Institutional Effectiveness*, 2nd ed. New York: Agathon Press, 1995. Nichols, J.O. *A Practitioner's Handbook for Institutional Effectiveness and Student Outcomes Assessment Implementation*, 3rd ed. New York: Agathon Press, 1995. These are practical guides to an extensive assessment process, with illustrative case studies.
- Peterson, M. S. Augustine, C. H., Einarson, M.K., and Vaughan, D. S. *Designing Student Assessment to Strengthen Institutional Performance in Associate of Arts Institutions*. Stanford, CA: Stanford University, National Center for Postsecondary Improvement, 1999. Similar volumes, also 1999, on Baccalaureate, Comprehensive, and Doctoral/Research universities.
- Upcraft, M. L. and Schuh, J. H. *Assessment in Student Affairs: A Guide for Practitioners*. San Francisco: Jossey-Bass, 1996.
- Walvoord, B. E. "Assessment in Accelerated Learning Programs." In R. J. Wlodkowski and C. E. Kasworm (eds.), *Accelerated Learning for Adults: The Promise and Practice of Intensive Educational Formats*. New Directions for Adult and Continuing Education, no. 97. San Francisco: Jossey-Bass, 2003. An 11-page summary of an early version of Walvoord's *Assessment Clear and Simple*, applicable not only to accelerated learning but also to traditional higher education.
- <http://ericae.net> provides links to what the sponsors consider some of the best full-text books, reports, journal articles, newsletter articles, and papers on the Internet that address educational measurement, evaluation and learning theory
- <http://ts.mivu.org>. The on-line journal, *The Technology Source*, sponsored by Michigan Virtual University, contains an online index: look under "assessment—past articles." Practical ideas for classroom and institutional assessment of online courses as well as other computer-based applications such as on-line testing.
- Subscribe to *Assessment Update* for the most recent examples and developments in assessment. Published monthly, it contains brief case studies of successful practice, updates on new developments, and reflections on issues of theory and practice. Order from the web page (www.josseybass.com) or by phone, 888-481-2665. Back issues are available.
- American Association for Higher Education is the premier national higher-education organization helping higher education institutions with assessment. Their conferences,

web resources, and publications are an ongoing source of good information (www.aahe.org).

- Conferences:
 - AAHE annual conference on assessment (www.aahe.org)
 - National Assessment Institute, held in Indianapolis at the conference center of the Indiana University-Purdue University Indianapolis, organized by Trudy Banta, one of the leading experts in assessment (www.planning.iupui.edu. Click on conferences).

Annual conferences of your regional or disciplinary accreditor