

University Learning Objectives (ULO) Based Assessment in GE and the Major 2008-2011

ULO-Based Assessment in GE and the Majors

Begun in Fall 2008, the ULO-based assessment commonly known as the ULO Project was coordinated by the Director of General Education (GE) under the auspices of Academic Programs. The project marked a concerted effort to define measurable outcomes for the ULOs and to directly assess student attainment of these outcomes. Although the individual assessments are at various stages of completion, the project as a whole has as its major aims to measure "value added," i.e., progress from the freshman year to the senior year, and, where possible, to close the loop by recommending improvements to pedagogy and curriculum.

Background. The project began with the appointment of five faculty members as ULO Consultants, each representing a different ULO-based skill: writing, oral communication, diversity learning, lifelong learning, and ethics. Each consultant formed a broadly representative committee composed of faculty members representing GE and various majors across the university, as well as staff members from Student Affairs. After reviewing nationwide best practices, two committees (Writing and Oral Communication) reviewed class assignments, three (Diversity Learning, Lifelong Learning, and Ethics) developed survey/test instruments to collect essay/multiple-choice responses, and one (Diversity Learning) used focus groups to explore student attitudes; all developed rubrics to identify traits and articulate levels of development. The committees intended to use student work from lower- and upper-division GE as well as major courses to determine freshman/sophomore and junior/senior levels of attainment and thereby measure the value added during a Cal Poly education; only three were able to accomplish this goal (Writing, Diversity Learning, and Lifelong Learning).

While these assessments are best considered as pilots, the committees have made some modest recommendations for educational improvement based on the evidence collected. The university has already implemented some, most notably workshops sponsored by the Center for Teaching and Learning (CTL) on ULO-based assessment of writing and critical thinking in the senior project. In connection with the ULO Project, Academic Programs revised the program review process to include the mapping of major courses and co-curricular activities onto the ULOs. Each program identifies where the ULOs are introduced, developed, and mastered in the major curriculum. A map of the GE curriculum is provided, although programs are not expressly required to consider the GE and major maps together. The intention is to encourage the faculty to locate and address any significant gaps in the students' education.

As an experiment in the assessment of transferable skills across the GE/major divide, faculty members from GE and the Orfalea College of Business ran a pilot of Integrated Program Review in Spring 2009. They applied the University Expository Writing Rubric to the work of Business students and used the assessment results to discuss how to improve student attainment of the ULO on effective communication. Though the group identified a number of opportunities for strengthening student writing, the integrated model has not been repeated nor revisited.

The ULO Project has come under some scrutiny during recent years. The financial crisis affecting the state, system, and university has necessitated a review of all resource allocations. The provost, concerned about the project's use of faculty release time for the ULO consultants, suspended funding for AY 2011-12. Shared governance has also been an issue; the WASC visiting team in its CPR report encouraged the faculty "to invest

time in reviewing the role and critical nature of faculty governance in academic decision-making," while the provost and Academic Senate Chair have shared a particular concern for faculty governance as it applies to academic assessment. This concern applies to the ULO Project; while involving a significant number of faculty and staff members as consultants and committee members, the project was still an initiative of Academic Programs. In AY 2010-11, the Senate responded to this situation and the WASC recommendation by adopting the following:

- AS-716-10 Resolution on Academic Assessment at the Program and University Levels established Senate oversight for institutional assessment in addition to clarifying the meaning of assessment and the use of assessment results.
- AS-713-10 Resolution on the Establishment of an Academic Senate General Education Governance Board transferred responsibility for GE from the Provost's Office, i.e., Academic Programs, to the Senate. With its location resolved, the GE Committee could return to the issue of GE program assessment, which has been the foundation of the ULO Project.
- AS-735-11 Resolution on Coordinated Campus Effort approved a task force report that recommended revising the membership of the Academic Assessment Council, in its existing form a committee of managers, to include faculty members from each college. The report also affirmed the council's responsibility for planning and coordinating institutional assessment efforts like the ULO Project.

The university hopes these resolutions will address the governance issues surrounding assessment and, by extension, the ULO Project.

ULO Project 1: Writing

To measure value added, the ULO Project on Writing assessed skill attainment at three key educational levels: first-year, 100-level GE composition courses; 200- and 300-level GE writing-intensive courses; and discipline-specific senior courses that emphasize writing.; The chair of the ULO Writing Committee was the English Department's Director of Writing, whose specialty is composition assessment and pedagogy. To obtain a consistent framework, the committee developed the four-point University Writing Rubric **Figure 1.4a** based on five traits of effective writing: purpose, synthesis, support, style, and mechanics. The committee examined persuasive essays of four to six pages in length because curricula across all levels and majors emphasize this type of writing.

Method. The committee collected work from 56 class sections that either had a GE designation of "writing intensive" or were taught by faculty members who made writing a priority. In total, the committee collected 1,147 essays. From this pool, the committee randomly selected 272 essays for scoring: 88 from freshmen, 41 from sophomores, 54 from juniors, and 89 from seniors. 153 of the essays were from men (56%), and 119 were from women (44%), which approximates the university's gender mix. **Figure 1.1** shows the sample's college breakdown.

There were three norming and scoring sessions. Once inter-rater reliability was established, two readers scored each essay, from which all identifying information about student or class level had been removed. Because of time constraints, the two scores were averaged rather than using a third reader to resolve discrepancies. The average scores were used in the following analyses.

Results: Class Level Comparisons. A statistical analysis compared the variables of Class Level (freshman, sophomore, junior, senior), College, Gender, and Trait. Only Class Level and Trait were significant (*see Appendix 1.1 full statistical analysis*). **Figure 1.2** presents student scores across all traits. A follow-up analysis showed that freshmen scored significantly lower than sophomores, juniors, and seniors; no additional progress in the mean total was evident after students' sophomore year. In other words, seniors differed from

freshmen in skill attainment but did not differ from sophomores and juniors. No other significant differences were found for Class Level. The data also show that about 20- 25% of sophomores, juniors, and especially seniors did not earn a score of 2 (average attainment) in their writing overall.

Results: Trait Comparisons. Follow-up comparisons showed that students were significantly stronger on both Purpose and Mechanics, which did not differ from each other, than on Synthesis, Support, and Style, which also did not differ from each other. The trait results suggest that these three higher-level writing skills need further development regardless of class level.

The scores in **Figure 1.3** present student attainment as a function of the specific trait assessed. For each trait, the figure shows the percentages of students earning a score of 2 or better on the rubric, as well as the mean score for each trait, all as a function of Class Level. For Purpose, freshmen scored significantly lower than both sophomores and seniors. No other Class Level comparisons were significant. For Synthesis, freshmen scored lower than both juniors and seniors. For Style, only the difference between seniors and freshmen was significant, with freshmen scoring lower. Finally, for both Support and Mechanics, follow-up comparisons showed that freshmen scored significantly lower than sophomores, juniors, and seniors, with no significant differences among these latter groups. It should be noted that most students reached average attainment on at least one trait. Mechanics was especially strong, with 73% of freshmen reaching average attainment or above; this increased to 83% of seniors, 89% of juniors, and 93% of sophomores.

In sum, analyses of the mean scores for each trait yielded the following observations:

- Seniors had higher scores across all rubric traits than freshmen.
- Juniors scored higher than freshmen on Synthesis, Mechanics, and Support.
- Sophomores scored higher than freshmen on Purpose, Mechanics, and Support.
- Sophomores, juniors, and seniors exhibited statistically equivalent levels of attainment across all traits.

Other Writing Assessments

English 134. In AY 2008-2009, the Associate Dean in the College of Liberal Arts and the ULO Writing Consultant conducted an assessment that compared students' initial and final essays in the first-year composition course, English 134 Writing and Rhetoric. The original sample was 156 students from 7 classes. First and last essays from 56 students-8 from each section-were randomly selected for assessment. Essays were scored using an earlier, holistic draft of the expository writing rubric. Final essay scores were significantly higher than those on the initial essays. As a follow-up, scores for both initial and final essays were compared to a constant of 3, indicating average attainment on the holistic rubric. Initial essay scores were significantly lower than 3; in contrast, final essay scores did not differ significantly from the constant. A separate test showed that initial and final essay scores were both correlated with final grades. Initial essay scores were weakly correlated with final grades, whereas final essay scores were significantly correlated with final grades.

The overall pattern of results with regard to the initial and final essay scores yielded promising evidence that students significantly improved in their writing during the quarter, that this improvement moved students to an average and acceptable level of attainment, and that the final essay scores were indicative of final grades. Importantly, the data showed that students progressed from minimal to average attainment of writing skills during the quarter. This finding is consistent with the ULO-based assessment results reported above that show gains following the freshman writing experience and suggest that students retain these initial gains.

Graduation Writing Requirement. All CSU students must satisfy the Graduation Writing Requirement (GWR). Cal Poly students can meet this requirement in two ways:

- Earn a C or better and successfully complete a timed essay in a GWR-designated, 300-level, writing-intensive GE course. Students who are unsuccessful receive feedback and at least one more opportunity to complete the essay. The pass rate was 84% for AY 2010-11.
- Pass the Writing Proficiency Exam (WPE), a 350-500 word, timed, expository essay test scored by writing experts and other faculty members. The WPE pass rate was 70% for AY 2010-11.

The essay and exam results likely constitute non-comparable samples for several reasons: students select the method of administration; the tests are administered in different environments; the content differs from test to test; the scoring differs across test types; and students taking the GWR course receive feedback and have a second opportunity to write the essay. In addition, each test may attract a different population, a factor that may interact with variables such as college, ethnicity, interest in writing, etc. To date, this question has not been looked at in a systematic way because the data have not been readily available. Finally, the essays administered in a GWR course may not be suitable for drawing university-level conclusions because they are only assessed by the instructors of record. However, multiple readers score the WPE using the WPE scoring criteria, which differ from those of the expository writing rubric. WPE readers assign a single score ranging from 1, ineffectual paper, to 6, exemplary paper, based on four traits: comprehension, organization, development, and expression. Stronger connections could be made between the WPE and expository writing rubrics. The expository writing rubric could be revised to function holistically, allowing readers to assign one score to an essay. Conversely, the WPE rubric could be revised to function analytically and thus provide more formative results. The latter approach seems appropriate as the WPE rubric was developed some time ago outside the framework of university-wide assessment.

Employer Surveys. In various surveys, Career Services has asked employers to indicate both the importance they place on certain skills, including written communication, and the degree to which Cal Poly graduates demonstrate attainment of these skills. The data in **Figure 1.4** show a discrepancy between the importance employers place on written communication and their perception of the skill level graduates demonstrate. For example, employers of graduates from the College of Engineering gave written communication a mean importance score of 4.41 on a scale of 1 to 5 with 1 being lowest and 5 being highest. Yet in assessing the industry readiness of engineering students, employers gave students a mean score of only 3.86. This discrepancy is especially important because employers consistently rank communication among the skills they value most in employees. Considering the ULO data showing that senior-level Cal Poly students generally do not outperform sophomores and juniors in writing, it would seem that additional instruction or an increased emphasis on this skill may be warranted.

Recommended Action Items:

1. Ensure that Cal Poly juniors and seniors continue to improve their writing skills (P. 4,5).

- Coordinate efforts with the University Writing and Rhetoric Center to develop and raise awareness of outreach programs that target upper-division students.
- Identify upper-division students who struggle with writing before their senior year, especially ESL students, and offer additional upper-division writing courses for these students.
- Coordinate efforts with the CTL and the WINGED (Writing in Generally Every Discipline) program to offer workshops and develop learning communities for faculty members who teach upper-division, writing-intensive courses in GE and the major.
- Emphasize the value of writing in every discipline by identifying non-GE, upper-division, writing-

intensive courses in the majors and across colleges; if such courses are difficult to identify, work with departments to develop discipline-specific, advanced writing courses, possibly tied to the senior project.

- Actively support Cal Poly's acquisition of an e-portfolio and assessment management system so that students can document and assess their own progress as writers.

2. Align learning experiences so that GE, the GWR, and the senior project form a coordinated assessment of writing skills at the beginning, developing, and mastery levels.

- Develop a single expository writing rubric for use by GE or GWR-designated courses, the WPE, and the senior project.
- Require Cal Poly undergraduates to satisfy the GWR as juniors, i.e., as soon as possible after completing ninety units, so that they can receive additional writing instruction if necessary before attempting the senior project.
- Make the WPE a formative assessment. The exam should be repurposed so that it becomes a formative tool for improvement rather than a summative gatekeeper to graduation.

ULO Project 2: Oral Communication

The ULO Project on Oral Communication began in September 2009. The ULO Oral Communication Committee adopted an operational definition from AAC&U's Oral Communication Value Rubric "a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors." Based on this definition, the committee designed a five-point rubric with seven traits: verbal delivery, nonverbal delivery, presence of a central message, organization, language use, use of supporting material, and use of visual aids.

Method. In the first year, the committee sought to establish a benchmark of students' performance toward the beginning of their academic careers. The assessment entailed videotaping oral presentations delivered by a sample of 102 freshmen enrolled in COMS 101 and 102 during Spring 2010. The sample was 51% female and 49% male and represented all six colleges: Engineering (24%), Agriculture (23%), Science and Math (20%), Liberal Arts (15%), Business (13%) and Architecture (7%). Frequencies for both gender and college distributions did not differ significantly from what would be expected.

Three faculty members from Communication Studies observed and evaluated the speeches. Training sessions ensured norming of scores and provided evaluators the opportunity to discuss, modify, and clarify the rubric as needed. Following these sessions, each evaluator scored a selection of speeches on each rubric trait on a scale of 1 to 5 with 1 being insufficient and 5 being excellent.

Results. **Figure 1.5** shows the overall scores, with the rubric traits presented in order from highest to lowest means. In addition, the figure shows the percentages of students scoring at each level of the rubric. Because so few had scores of 1, percentages for scores of 1 and 2 (insufficient and below average) were added together (see Appendix 1.1 for full statistical analysis). **Figure 1.5a** shows the communication rubric used for the scoring developed by Lorraine Jackson, Professor of Communication Studies.

Because Use of Visual Aids was not a component of all speeches, two different statistical analyses were run on the differences in mean trait scores. One considered all 7 traits for the 75 students who had scores on all 7, while the second considered all 102 students but excluded Use of Visual Aids. A follow-up comparison showed the same basic pattern in both analyses: students' trait scores were significantly higher for Language Use and Use of Supporting Materials than for Verbal and Non-Verbal Delivery and for Presence of a Central Message than for Verbal Delivery. In the seven-trait analysis, scores were significantly higher for Presence of a Central

Message than for Non-Verbal Delivery. There were no other significant differences.

These data suggest that the vast majority of Cal Poly freshmen meet an average (3) or better level of competence in oral communication, even with only introductory instruction. This is good news, but the data also suggest that students' verbal and nonverbal delivery could be developed further; only a quarter of the sample achieved a score of good (4) or excellent (5). Improvement in these areas would likely occur over time as students received further instruction and additional speaking opportunities. However, given that Cal Poly requires most students to take only one course focusing on oral communication, instructors of that course should consider spending additional time on improvement of verbal and nonverbal delivery.

During the second year of the project, the committee presented these results to the University Assessment Council and the Communication Studies faculty. In addition, the committee delivered a ULO-based oral communication workshop through the CTL in which twelve participants applied the rubric after watching both a below average speech and a good speech. The first speech received an average score of 2.2 and the second received an average score of 4.4. This consistency indicates that the participants used the rubric to make reliable distinctions of quality between the two speeches. The committee originally planned a third year of activity to assess senior-level presentations perhaps in connection with senior projects, but budget cuts curtailed this aspect of the project.

Recommended Action Items

3. Identify areas of the curriculum outside the GE oral communication requirement in which the Communications Studies faculty can partner with other faculties to develop students' oral communication skills (p. 6).
4. Complete the ULO Project on Oral Communication by collecting data on upper-division student performance and making a value-added comparison to lower-division results (6).

ULO Project 3: Diversity Learning

The ULO Project on Diversity Learning began in AY 2008-09. Based on faculty and staff feedback, the ULO Diversity Learning Committee designed separate surveys for each of the first three of Cal Poly's Diversity Learning Objectives (DLOs are listed below)

Diversity Learning Objectives

All Students who complete an undergraduate or graduate program at Cal Poly should be able to make reasoned decisions based on a respect and appreciation for diversity.

Students should be able to:

1. Demonstrate an understanding of relationships between diversity, inequality, and social, economic, and political power both in the United States and globally
2. Demonstrate knowledge of contributions made by individuals from diverse and/or underrepresented groups to our local, national, and global communities
3. Consider perspectives of diverse groups when making decisions
4. Function as members of society and as professionals with people who have ideas, beliefs, attitudes, and behaviors that are different from their own

and used a focus-group protocol to assess the last objective. The committee also developed four-point rubrics to score the data collected for each DLO.

Method for DLOs 1-3. In fall quarter, the committee collected responses to the DLO questionnaires from 320 freshmen enrolled in ENGL 134, ENGL 145, and ECON 303. In Fall 2009 and Winter 2010, the committee collected 380 responses from juniors and seniors enrolled in several GE DS (the upper division elective in Area *DIE* Society and the Individual) courses as well as ECON 303, IME 482, KINE 411, MATE 481 and ME 430. Students randomly assigned to respond to only one DLO survey completed either paper-and-pencil or online versions. **Figure 1.6** shows the resulting sample as a function of College and Class Level, as determined by students' self-reported expected graduation date. Across the samples, there were 343 men (51%) and 324 women (49%), which approximates the university's gender mix. 400 students (60%) self-identified as white, the largest racial/ethnic group, while 86 (13%) self-identified as multiracial, the next largest group.

In Spring 2010, after ensuring inter-rater reliability, the committee conducted three scoring sessions with faculty and staff members. Although data were collected from all class levels, evaluators did not score the sophomore essays due to resource and time constraints and the assessment emphasis on value added.

For DLO 1, students answered four short essay questions, each corresponding to one of four traits in the rubric: knowledge and understanding, ability to apply a critical perspective, awareness of how personal values and/or ethical/moral frameworks shape individual beliefs, and self-reflection and engagement. Two evaluators scored each set of essays for each trait on a scale of 0 to 4 with 0 being no response and 4 being complex. The two scores were then averaged to obtain one score for each trait, and the four trait scores were then averaged to yield one total mean score for each participant in the assessment. The same process was employed to create mean scores for DLOs 2 and 3.

Results for DLO 1: Diversity, Inequality, and Power. A statistical analysis was conducted on the total mean scores for DLO 1 as a function of Class Level (freshman, junior, senior), College, Survey Mode (in-class, online), and Gender. **Figure 1.7** shows the breakdown of scores by various student categories. The sample sizes were too small to support analyses of the interactions of more than two variables. The results were significant for Survey Mode, Gender, Class Level, and College. Significantly higher scores were evident for the online survey and for males. Follow-up analysis of Class Level yielded evidence of value added: both seniors and juniors scored higher than freshmen but did not differ from one another. With regard to College, the follow-up analysis showed that Agriculture students scored significantly lower than Business, Science and Math, and Engineering students. No other College differences were significant (See Appendix 1.1 for full analysis.)

There was also a significant interaction of Gender by Class Level. The value added was more apparent in men, such that male seniors had significantly higher scores than male freshmen. This was not so with women, whose scores did not differ as a function of Class Level. It should be noted that marginally significant interactions were also present for College by Class Level and College by Survey Mode, but these interactions were not broken down further because of concerns with sample sizes.

Results for DLO 2: Contributions by Diverse Groups. As with DLO 1, a statistical analysis was conducted on the total mean scores for DLO 2 as a function of Class Level, College, and Survey Mode. Gender was not included in the analysis. **Figure 1.8** shows the breakdown of scores by various student categories. The results were significant for Survey Mode, Class Level, and College. Again, the online survey mode resulted in significantly higher scores. The Class Level effect showed that while there were no differences between junior and senior scores, both seniors and juniors scored significantly higher than freshmen. The College effect showed that Science and Math students scored significantly higher than Agriculture and Engineering students, with no other differences among colleges reaching significance. There was, however, a significant interaction between Class Level and College. Among freshmen, Science and Math students scored significantly higher than Business students; among seniors, Science and Math students scored significantly higher than Engineering students. Small, unequal sample sizes mean that caution should be used in interpreting these results.

Results for DLO 3: Perspectives of Diverse Groups. **Figure 1.9** presents the mean scores for DLO 3. The results of the statistical analysis were significant for Class Level, College, and Gender. There were no significant interactions between variables. Men scored significantly higher than women; students in the College of Business scored significantly higher than students in all other colleges except Liberal Arts; Liberal Arts students scored significantly higher than Agriculture students. Finally, there was once more evidence of value added: both seniors and juniors scored higher than freshmen but did not differ from one another. The pilot nature of the project needs to be stressed, especially with regard to college results. The low and uneven numbers of participants make these patterns tentative at best.

Contribution of USCP Program. Starting with the 1994-97 catalog, Cal Poly students have had to satisfy the United States Cultural Pluralism (USCP) Requirement (*see below*)

United States Cultural Pluralism (USCP) courses must focus on all of the following:

- One or more diverse groups (defined as specifically inclusive of, but not limited to, an individual's race/ ethnicity, sex/gender, socioeconomic status, cultural heritage, disability, and sexual orientation), whose contributions to contemporary American society have been impeded by cultural conflict or restricted opportunities, as stated in the Diversity Learning Objectives
- Contemporary social issues resulting from cultural conflict or restricted opportunities, including , but not limited to, problems associated with discrimination based on age, ethnicity, gender, nationality, abilities, religion, sexual orientation, socioeconomic status, or race
- Critical thinking skills used by students to approach these contemporary social issues in a sensitive, responsible manner; examine their own attitudes; and consider the diverse perspectives of others
- The contributions of people from diverse groups to contemporary American society

by completing a course focusing on diverse groups and social issues. Because fulfillment of the requirement is the major curricular path for developing diversity-related competence, a separate analysis was conducted to compare mean DLO scores for juniors and seniors grouped together as a function of having taken a USCP course. Although the overall average score for juniors and seniors who had not completed a USCP course (2.02) was lower than the score for juniors and seniors who had completed a USCP course (2.18), this difference was not statistically significant. The percentage of student essays that scored in the 3 (moderate) or 4 (complex) levels was equal to 32% for juniors and seniors who had not completed a USCP course and 38% for juniors and seniors who had completed a USCP course. Although the average score and percentage of essays that met higher standards were both somewhat greater for students who had completed a USCP course, the results do not indicate that having taken a USCP course makes a large positive contribution to diversity learning as defined by the DLOs.

Contribution of Service Learning. Another avenue by which students may gain diversity-related competence is service learning. Although not a graduation requirement, a number of students take service learning courses in fulfillment of GE or major requirements.

The overall average score for juniors and seniors who had not completed a service learning course (2.08) was lower than the score for juniors and seniors who had completed a service learning course (2.19), but this difference was not statistically significant. The percentage of student essays with scores in the 3 or 4 levels was 32% for juniors and seniors who had not completed a service learning course and 40% for juniors and seniors who had completed a service learning course. Similar to USCP, these results do not indicate that service learning makes a large positive contribution to diversity learning as defined by the DLOs.

Method and Results for DLO 4: Professionals in a Diverse World. The committee conducted focus-group sessions with approximately 80 freshmen enrolled in Honors 100 during Fall 2009 and with approximately 90 seniors enrolled in ECON 303 during Winter 2010. These classes were selected because they were available and because students enrolled in these courses likely had the maturity level necessary to explore the issues seriously. Using transcripts of these sessions, the committee compiled a list of key themes discussed by

students. The list served as the context for the committee's conclusions about student knowledge, perceptions, and beliefs about working together with people from diverse backgrounds-an appropriate focus for Cal Poly, whose institutional identity is marked by the preponderance of professional degree programs.

The focus-group responses reveal a negative student bias against diversity learning, especially in the context of classroom instruction, which seems to exist before students enter Cal Poly. Senior students were better able than freshmen to reflect on their experiences of diversity learning in the classroom but still gave mixed responses; some were positive about these experiences while others viewed them as a form of indoctrination. Virtually all students who spoke were positive about WOW (the Week of Welcome orientation for freshmen) and other cultural events outside the classroom and wished that there were more such opportunities and more campus diversity in general.

Recommended Action Items

5. Coordinate diversity learning across the curriculum and co-curriculum to create a scaffold for the development of DLO-based skills

- Align the USCP requirement with the DLOs and review USCP courses to see whether they address the DLOs.
- Align service learning policies with the DLOs and review service learning courses to see whether they address the DLOs.
- Challenge every major to develop an upper-division experience that addresses the DLOs.

ULO Project 4: Lifelong Learning

The ULO Project on Lifelong Learning began in Spring 2010, when Kennedy Library conducted a survey of student information skills in consultation with the ULO Lifelong Learning Committee. Information skills are a foundational component of lifelong learning, and they contribute to other ULOs including written and oral communication.

Method. The survey was designed to identify student competencies by measuring performance on the Information Literacy Learning Objectives, which the library established in 2009. The survey presented students with a research scenario and asked them to respond to a series of 20 questions. Two versions were administered during a one-month period: one for lower-division and one for upper-division students. The versions differed by the order in which questions were asked and the wording of some questions.

Invitations to participate were emailed to 1,332 lower-division and 2,905 upper-division students. In addition, an open invitation was posted on the library website, and instructors who had previously brought students for library instruction were encouraged to announce the survey to current students. Approximately 98% of the responses came from the email invitations. Without adjusting for the remaining 2%, the lower-division response rate was 28% (367 respondents) and the upper-division response rate was 20% (578 respondents). The high response rate likely resulted from the promise of cash prizes; however, not all respondents answered all questions.

Results. **Figure 10** presents the mean scores in terms of percent correct for five questions for which there was a single response. A statistical analysis was conducted to determine whether the correct response to each item was related to Class Level and Instruction; the latter factor distinguished between students who had and had not received library instruction in research methods. In all cases, upper-division students did

better than lower-division students. For three of the five items-thesis statement/promising research question, correct identification of citation example, and correct selection of the search term that would yield the fewest results-Class Level had a significant effect, demonstrating value added. There was a marginal effect of Class Level on the correct selection of the search term that would yield the most results. Significant effects of Instruction were found for the thesis statement and correct identification of the citation example. The question on the ethical use of ideas showed no significant effects of either Class Level or Instruction. Across all analyses, no significant interactions between variables were present (see Appendix 1.1 for full statistical analysis).

The results demonstrate value added across several items on the survey, indicating higher levels of information literacy at the upper-division level. In addition, promising results for the educational effectiveness of library-related instruction were also found, with some indication that lower-division students attending such instruction consistently scored almost as well as upper-division students who had not attended such sessions. It should be noted that the outcomes measured in this scenario-based questionnaire necessarily focused on the means of finding and identifying information rather than on the more complex evaluative and synthetic skills associated with the critical-thinking aspects of information literacy.

Future Plans. The library plans to re-administer the information literacy survey in Spring 2012 to provide more and better data about student learning as a function of Library Instruction and Class Level. When revising the survey, more attention will be paid to the planned analysis, making sure that the upper- and lower-division questions are directly comparable.

ULO Project 5: Ethics

The ULO Project on Ethics was developed for a portion of the ULO that reads, "Make reasoned decisions based on an understanding of ethics, a respect for diversity, and an awareness of issues related to sustainability." The ULO Ethics Committee found AAC&U Value Rubric to be the most appropriate to the project. While adapting the rubric, the committee identified five primary traits relevant to ethics and ethical reasoning: self-awareness, understanding different ethical theories/concepts, ethical issue recognition, application of ethical theories/concepts, and evaluation of different ethical perspectives/concepts.

Method. In the first year of the project, the committee created and piloted a 40-item online test to begin measuring student proficiency in ethical reasoning. Because the instrument was in development, the committee collected limited demographic information: class level, college, and location of administration, i.e., whether or not the test was administered in an ethics course. In addition, several open-ended questions asked respondents to comment on the structure and content of the test in order to collect input for further development.

The instrument included 37 multiple-choice questions. Six questions tested students' level of self-awareness about the origins of their ethical beliefs. These items were scored on a scale of 1 to 5 with 1 being strongly disagree and 5 being strongly agree. Because these items could not be scored as correct or incorrect, they were not used to compute the score. Eleven questions tested students' understanding of different ethical theories and concepts; seven tested their ability to recognize ethical issues; six tested their ability to apply ethical theories and concepts; and seven tested their ability to evaluate different ethical perspectives and concepts. These items allowed respondents to choose among four to five answers; responses were coded as correct/incorrect and summed together for a total test score. In

addition, the mean score for each of these traits was also computed.

Participants were recruited in two ways. University Assessment Council members, college deans, ethics committee members, and others were asked to identify appropriate courses; the plan was to recruit participants who had been formally exposed to the study of ethics at the university level. Because the resulting group was too small, committee members and others were asked to administer the test in their own classes, even if these were not related to ethics. Courses finally included BMED 420, BUS 424, ES 244, ES 322, PHIL 230, PHIL 231, PHYS 405, and PHYS 424. The pilot resulted in completed responses from 264 undergraduate students-more than expected-representing every college and class year (first year, second year, third year, fourth year) as well as varying levels of ethics coursework.

Results: Class Year and College Comparisons. Figure 1.11 shows the numerical breakdown by College and Class Year. Out of 31 points possible, the average exam score was 12.45; i.e., students answered 40% of the questions correctly (*see Appendix 1.1 for full analysis*). Because of small and uneven sample sizes and concerns regarding the distributions of the data, separate statistical analyses were run to compare the total scores as a function of Class Year (see **Figure 1.12**) and College (see **Figure 1.13**). The result for Class Year was not significant; there was no evidence of value added on the ethics scores, though this may have been a function of small sample sizes. The visual pattern of the data when comparing first-year students to fourth- and fifth-year students is in the predicted direction, i.e., first-year students have lower scores than fourth- and fifth-year students. In contrast, the result for College was significant. Separate follow-up analyses showed that students in the College of Science and Math scored significantly higher than students in all other colleges. No other differences among colleges were significant.

Results: Trait Comparison. **Figure 1.14** shows the mean trait results as a function of Course Enrollment, i.e., whether or not students had taken or were currently enrolled in a university-level ethics course. Because the different traits were tested with different numbers of items, the means shown for each trait are the mean percentages of correct answers. It should be noted that all responses are at a higher level of ethical reasoning than would be expected by chance.

A mixed-model analysis compared the four different traits as a function of Course Enrollment. There were no effects involving having taken an ethics course. Among the traits, students scored significantly higher on Application of Ethical Theories/Concepts as compared with both Understanding Different Ethical Theories/Concepts and Ethical Issue Recognition. Students also scored significantly higher on Evaluation of Different Ethical Perspectives/Concepts as compared with Understanding Different Ethical Theories/Concepts. Finally, students scored slightly higher on Ethical Issue Recognition as compared with Understanding Different Ethical Theories/Concepts. No other comparisons were significant.

The sample sizes were too small to allow an analysis by both College and Class Year. Being able to do so would have helped reveal whether the finding that students in Science and Math scored higher than students in other colleges can be better understood as a function of Class Level (freshman, sophomore, junior, senior). Recruiting Science and Math students from upper-division physics classes may have created selection problems that impact the generalizability of the results. Still, a positive result is that students are better at applying and evaluating different ethical perspectives and concepts, even if they are not as good at recognizing and understanding these concepts. It may be possible to use students' application and evaluation capabilities to help them better identify and understand ethical issues, especially when these issues are presented in more abstract terms as items on a test.

Due to budget cuts, the ethics project was only active for one of the three years originally proposed. Plans for

the second year had included refining the test and assessing the achievement of a larger, more varied set of students. If the project is revived, it may be important to re-examine how ethics is defined for assessment purposes or to better align the instrument with the learning outcomes of ethics courses because having taken such courses did not improve students' performance on the assessment.

Recommended Action Items

- 6. Complete the ULO Project on Ethics, taking into account the need to align the instrument with the learning outcomes of ethics courses (p. 10).**

Final Comments on the ULO Project

The ULO Project represents Cal Poly's first foray into institutional assessment, and the individual projects need to be viewed as pilots that should inspire further thinking about processes, measures, and resources. The ULO Project has required and institutional investment of time, effort, and support, but it has also involved a large number of participants from across the university, many of whom volunteered their time and expertise. The effort yielded important cross-unit conversations and collaborations on assessment that have not been part of Cal Poly's culture. This in itself is worth an investment.

***Appendix 1.1 and Figures 1.1 – 1.15
For (ULO) Based Assessment in GE and the Major***

Appendix 1.1 ULO Project Statistical Analysis

- Figure 1.1** Numbers of ULO Project on Writing Participants as a Function of College and Class Year
- Figure 1.2** Overall Mean Scores Across Class Levels for ULO Project on Writing Participants
- Figure 1.3** Percentages and Means (M) of ULO Project on Writing Participants Scoring at least a 2 (Average Attainment) as a Function of Rubric Trait Scores and Class Levels
- Figure 1.4** Written Communication Rankings on Recent Employer Surveys
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- Figure 1.7.** Mean Scores and Distribution of Scores by Various Student Categories on DLO 1
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- Figure 1.10** Mean Response Results for Selected Information Literacy Items as a Function of Class Level and Library Instruction on Research Methods
- Figure 1.11** Numbers of ULO Project on Ethics Participants as a Function of College and Class Year
- Figure 1.12** Ethical Learning Outcome Scores as a Function of Class Year
- Figure 1.13** Ethical Learning Outcome Scores as a Function of College
- Figure 1.14** Ethical Learning Outcome Scores as a Function of Trait and Ethics Course Enrollment
- Figure 1.15** Employer Survey Results for Overall Graduate Quality and Industry Readiness

Appendix 1.1: ULO Project Statistical Analysis

Writing Project

Variables of Class Level, College, Gender, and Trait. A single omnibus mixed model ANOVA was done to compare the effects of the between-subjects variables of Class Level, College, and Gender and the within subjects variable of Trait. Only the main effects of Class Level, $F(3, 226) = 4.21$, $MSE = .354$, $p < .01$, and Trait, $F(4, 904) = 17.08$, $MSE = .189$, $p < .01$, were significant (all other F s ≤ 1.14). Follow-up tests using Tukey's HSD showed that freshmen scored significantly lower than sophomores, juniors, and seniors (p s $\leq .05$). No other significant differences were found for class level.

Separate ANOVAs for the planned comparisons for each trait as a function of class level showed a significant effect of class level for every trait. For Purpose, $F(3, 266) = 4.32$, $MSE = .626$, $p = .01$, the follow-up comparisons using Tukey's HSD (used for all reported follow-up comparisons reported here) showed that freshmen scored significantly lower than both sophomores and seniors. No other class level comparisons were significant. For Synthesis, $F(3, 266) = 4.41$, $MSE = .501$, $p < .01$, freshmen scored lower than both juniors and seniors. For Style, $F(3, 266) = 2.87$, $MSE = .456$, $p < .04$, only the difference between seniors and freshmen was significant, with freshmen scoring lower. Finally, for both Support, $F(3, 266) = 10.34$, $MSE = .499$, $p < .01$, and Mechanics, ($F(3, 266) = 6.60$, $MSE = .447$, $p < .01$), follow-up comparisons showed that freshmen scored significantly lower than sophomores, juniors, and seniors, with no significant differences among these groups.

English 134. In order to test the hypothesis that post-test scores would be significantly higher than pre-test scores, a paired sample t -test was used. The result was significant, $t(55) = 7.20$. Post-test scores ($M = 3.01$) were significantly higher than pre-test scores ($M = 2.20$). As a follow-up, both the pre-test and post-test scores were compared to a constant of 3 (indicating average attainment on the holistic rubric) in separate one-sample t -tests. Pre-test scores were significantly lower than the criterion score of 3, $t(55) = -9.77$, $p < .05$. In contrast, post-test scores did not differ significantly from the criterion score ($p = .86$).

Pre-test and post-test scores were both correlated with final grades. Pre-test scores were weakly correlated with final grades, $r(54) = .24$, $p = .08$, whereas post-test scores were significantly correlated with final grades, $r(54) = .33$.

Oral Communication

Separate chi-square analyses confirmed that the observed frequencies for both the gender distribution and the college distribution did not differ significantly from the expected frequencies.

Differences in the mean scores for traits were analyzed in two separate repeated measures ANOVAs—one looking at all seven traits for the 75 students who had scores on all of the traits, and the second for the 102 students who had complete data on the six traits *excluding* the Use of Visual Aids. Both analyses were significant, $F(6, 444) = 5.70$, $MSE = .430$, $p < .01$ for the seven-trait comparison; $F(5, 505) = 6.62$, $MSE = .383$, $p < .01$ for the six-trait comparison. Follow-up pairwise comparisons using a Bonferroni adjustment showed the same basic pattern in both sets of analyses. Students' trait scores were significantly higher for Language Use and Use of Supporting Materials than for Verbal and Non-Verbal Delivery scores. In addition, the presence of a Central Message was significantly higher than the Verbal Delivery score in both analyses; in the seven-trait analysis the presence of a Central Message was also significantly higher than the Non-Verbal Delivery score (all p 's $\leq .05$). There were no other significant differences.

Diversity Learning

DLO1. An omnibus factorial ANOVA was done to analyze the total mean scores for DLO 1 as a function of Class Level, College, Survey Mode (in-class, online), and Sex. Table D2 shows the breakdown of scores by various student categories. It should be noted that the cell sizes were too small or had no observations to support looking at possible three-way and four-way interactions.

The ANOVA results for DLO 1 showed significant main effects for Class Level, $F(2, 157) = 10.02$, $MSE = .451$, $p < .01$; College, $F(5, 157) = 5.88$, $MSE = .451$, $p < .01$; Survey Mode, $F(1, 157) = 18.40$, $MSE = .451$, $p < .01$; and Gender, $F(1, 157) = 6.84$, $MSE = .451$, $p < .01$. Significantly higher scores were evident for the online survey and for males. Follow-up Tukey HSD tests on the main effect of Class Level yielded evidence for value added: both seniors and juniors scored higher than freshmen but did not differ from one another. With regard to the main effect of College, the follow-up Tukey HSD tests showed that CAFES students scored significantly lower than OCOB, COSAM, and CENG students. No other College differences were significant.

There was also a significant interaction of Sex by Class Level, $F(2, 157) = 4.89$, $MSE = .451$, $p < .01$. The value added was more apparent in men, such that male seniors had significantly higher scores than male freshmen: $M(\text{freshman}) = 1.66$, $M(\text{juniors}) = 2.00$, $M(\text{seniors}) = 2.48$. This was not so with women: $M(\text{freshman}) = 1.48$, $M(\text{juniors}) = 1.83$, $M(\text{seniors}) = 1.71$, whose scores did not differ as a function of Class Level. It should be noted that marginally significant interactions were also present for College by Level ($F = 1.91$, $p = .05$) and College by Survey Mode ($F = 2.36$, $p = .06$) but are not broken down further here because of concerns with sample sizes.

DLO 2. As with DLO 1, an omnibus factorial ANOVA was done to analyze the total mean score for DLO 2 as a function of Class Level (freshman, junior, senior), College (CAED, CAFES, CENG, CLAM, CSM, OCOB), and Survey Mode (in-class, online). Sex was not included in the analysis. Table D3 shows the breakdown of the scores by various student categories.

There were significant main effects of Class Level, $F(2, 206) = 8.53$, $MSE = .529$, $p < .01$; College, $F(5, 206) = 4.64$, $MSE = .529$, $p < .01$; and Survey Mode, $F(1, 206) = 4.11$, $MSE = .529$, $p < .05$. Again, the online survey mode resulted in significantly higher scores.

The Class Level effect showed that while there were no differences between junior and senior scores, both seniors and juniors scored significantly higher than freshmen, with no differences between their scores. The College Level effect showed that COSAM students scored significantly higher than CAFES and CENG students, with no other College Level differences reaching significance. There was, however, a significant interaction between Class Level and College, $F(10, 206) = 1.92$, $MSE = .529$, $p < .05$, such that among freshmen, COSAM students ($M = 1.75$) scored significantly higher than OCOB students ($M = .90$) and that among seniors, COSAM students ($M = 2.49$) scored significantly higher than CENG students ($M = 1.45$). Especially with regard to the college-level results, including these interactions, small, unequal sample sizes mean that one should not over interpret these results.

DLO 3. Table D4 presents the mean scores for DLO 3. The omnibus ANOVA using Class Level, College, Survey Mode, and Gender yielded three significant main effects and no interactions. Class Level, $F(2, 179) = 23.18$, $MSE = .564$, $p < .01$; College, $F(5, 179) = 4.40$, $MSE = .564$, $p < .01$; and Gender, $F(1, 179) = 12.01$, $MSE = .564$, $p < .01$, were all reliable.

USCP. Because fulfillment of the USCP requirement is the major curricular path for developing diversity-related competence, a separate t-test was done to compare mean scores for juniors and seniors

only collapsed across both Class Level and DLO. Although the overall average score for juniors and seniors who had not completed a USCP course ($n = 63$, $M = 2.02$) is lower than the score for juniors and seniors who had completed a USCP course ($n = 205$, $M = 2.18$), this difference was not statistically significant.

Service Learning. The overall average score for juniors and seniors who had not completed a service-learning course ($n = 155$, $M = 2.08$) was lower than the score for juniors and seniors who had completed a service-learning course ($n = 137$, $M = 2.19$), but again a t-test showed that this difference was not statistically significant. The percentage of student essays with scores in the “3 = moderate” or “4 = complex” levels, was 32% for juniors and seniors who had not completed a service-learning course and 40% for juniors and seniors who had completed a service-learning course. Similar to USCP, these assessment results do not indicate that service learning makes a large positive contribution to diversity learning as defined by the DLOs.

Lifelong Learning

Table LL1 presents the mean scores in terms of percent correct for five questions for which there was a single response, i.e., check one, that could then be coded as correct or incorrect. Five 2x2 ANOVAs were done to examine whether the correct response on each item was related to Class Level and Instruction. It was hypothesized that both factors would be related to success on the questionnaire, with upper-division students doing better than lower-division students and students who had received library instruction doing better than students who had not received instruction. Across all analyses, no significant interactions were present (all F 's ≤ 1.04).

Significant main effects of Class Level (value added) were found for three of the five items; in all cases, upper-division students did better than lower-division students. Significant effects of Instruction were found for the correct identification of the thesis statement and the citation example. For thesis statement/promising research question, upper-division students, $M = .783$, did significantly better than lower-division students, $M = .676$, $F(1, 794) = 12.02$, $MSE = .187$, and students with library instruction, $M = .774$, did significantly better than students who had received no instruction, $M = .771$, $F(1, 794) = 4.29$, $MSE = .187$. In the correct identification of the citation example, again upper-division students, $M = .513$, did significantly better than lower-division students, $M = .384$, $F(1, 757) = 14.53$, $MSE = .137$, as did students with library instruction, $M = .501$, compared to students without library instruction, $M = .429$, $F(1, 757) = 6.81$, $MSE = .137$. Upper-division students, $M = .784$, did significantly better than lower-division students, $M = .680$, on the correct selection of the search term that would yield the fewest results, $F(1, 782) = 10.57$, $MSE = .187$. Finally, there was a marginal effect of class level on the correct selection of the search term that would yield the most results, $F(1, 782) = 3.08$, $MSE = .240$, $p = .08$; upper-division students ($M = .623$) were slightly more apt to identify the item correctly as compared to lower-division students ($M = .556$). The question on the ethical use of ideas showed no significant effects of either Class Level or Instruction (F 's < 1.00).

Ethics

Out of 31 points possible, the average exam score was 12.45, i.e., students answered 40% of the questions correctly. Because of small and uneven sample sizes and concerns regarding the distributions of the data, separate Kruskal-Wallis tests were run to compare the total scores as a function of Class Year (see **Table E2**) and College (see **Table E3**); the result for Class Year was not significant ($F < 1.50$). There was no evidence of value added on the ethics scores, though this may have been a function of small sample sizes. The visual pattern of the data when comparing first-year students to fourth- and fifth-year students is in the predicted direction.

The result for College was significant, $\chi^2(5, N = 264) = 14.95, p = .011$. Separate Mann-Whitney U tests as follow-ups showed that students in the College of Science and Math scored significantly higher than students in all the other colleges. No other differences among colleges were significant.

A mixed model analysis of variance with one between subjects factor (Course) and one within subjects factor (Trait) compared the four different traits as function of course enrollment. There were no effects involving having taken an ethics course (all $F_s \leq 1.75$). The repeated measures factor of Trait showed a significant difference among the scores, $F(3, 786) = 13.465, MSE = .032, p < .01$. Follow-up pairwise comparisons using a Bonferroni adjustment for multiple comparisons showed that students scored significantly higher on “Application of Ethical Theories/Concepts” as compared to both “Understanding Different Ethical Theories/Concepts.” and “Ethical Issue Recognition.” Students also did significantly better on the “Evaluation of Different Ethical Perspectives/Concepts” as compared to their “Understanding Different Ethical Theories/Concepts” (all p ’s $< .01$). Finally, there was a marginal effect such that “Ethical Issue Recognition” was slightly better than “Understanding Different Ethical Theories/Concepts” ($p = .06$). No other comparisons were significant.

Figure 1.1. Numbers of ULO Project on Writing Participants as a Function of College and Class Year

Class Year	CAED	CAFES	CENG	CLA	OCOB	COSAM	TOTAL
Freshman	12	14	33	6	14	8	87
Sophomore	0	7	16	11	4	3	41
Junior	2	13	13	12	8	5	53
Senior	18	7	11	27	3	23	89
TOTAL	32	41	73	56	29	39	270

Figure 1.2: Overall Mean Scores Across Class Levels for ULO Project on Writing Participants

		Poor/No Attainment (Score 0/1 < 2)		Average Attainment (Score 2 < 3)		Good Attainment (Score 3 ≤ 4)		
Class	N	n	%	n	%	N	%	Mean
Freshman	87	44	50.1%	38	44.7%	5	5.8%	1.97
Sophomore	41	11	26.8%	27	65.9%	3	7.3%	2.32
Junior	53	12	22.6%	36	67.9%	5	9.4%	2.28
Senior	89	23	25.8%	54	60.7%	12	13.5%	2.36
TOTAL	270	90	33.3%	155	57.4%	25	9.2%	2.21

Figure 1.3: Percentages and Means (M) of ULO Project on Writing Participants Scoring at least a 2 (Average Attainment) as a Function of Rubric Trait Scores and Class Levels

Class Year	N	Purpose	Synthesis	Support	Style	Mechanics
Freshman	87	68.2% (M = 2.09)	59.1% (M = 1.87)	48.9% (M = 1.78)	65.9% (M = 2.00)	72.7% (M = 2.10)
Sophomore	41	87.8% (M = 2.51)	78.0% (M = 2.13)	75.6% (M = 2.20)	82.9% (M = 2.26)	92.6% (M = 2.51)
Junior	53	76.0% (M = 2.41)	75.9% (M = 2.19)	75.9% (M = 2.12)	72.3% (M = 2.14)	88.9% (M = 2.51)
Senior	89	76.3% (M = 2.45)	73.0% (M = 2.23)	83.1% (M = 2.37)	76.4% (M = 2.28)	83.1% (M = 2.47)
TOTAL	270	75.4% (M = 2.33)	69.9% (M = 2.09)	69.5% (M = 2.11)	73.2% (M = 2.16)	82.4% (M = 2.36)

Figure 1.4: Written Communication Rankings on Recent Employer Surveys

College	Program/College	Survey Year	Mean Employer Importance	Demonstrated Skill Attainment	Rank*
CENG	College-Wide	2008-09	4.41	3.86	First
OCOB	College-Wide	2008-09	4.06	3.80	First
CAFES	NRM: Forestry and Natural Resources	2009-10	4.59	3.88	Second
CAFES	NRM: Environmental Management and	2009-10	4.62	3.75	First
CLA	Graphic Communications	2009-10	4.63	3.95	First

* of Communication Skills among Personal Qualities Valued by Employers

PURPOSE

- Does the writer address the assignment and write with a purpose that is clear to the reader?
- Is there an identifiable thesis?
- Does the writer understand and meet the audience's expectations?

SYNTHESIS

- Is the paper organized both locally (within paragraphs) and globally (as a whole)?
- Does the organizational strategy best express the purpose?
- Does the writer make connections between (un)related ideas, texts, perspectives, and experiences to construct a cohesive depiction of the topic?

SUPPORT

- Is the thesis fully supported with relevant evidence or does the essay rely on broad and general assertions?
- Is repetition mistaken for development?
- Are there errors in logic?

STYLE

- Does the writer make effective stylistic choices in terms of paragraphing, sentence structure, word choice, tone, introductions, conclusions, etc?

MECHANICS

- Is the essay free of errors - spelling, punctuation, grammar - that consistently impede or even distort meaning?

UNIVERSITY EXPOSITORY WRITING RUBRIC – ULO COMMITTEE
Updated February 3, 2011

(Figure 1.4a)

Trait:	Poor/No Attainment Score =0	Minimal Attainment Score =1	Average Attainment Score =2	Good Attainment Score = 3	Superior Attainment Score =4
Purpose: Addresses the assignment. Clearly articulates the focus/thesis and writes with an awareness of the audience's expectations.	Disregards assignment. No discernible focus/thesis. Unaware of audience's expectations.	Seems aware of the assignment's goals, but does not consistently meet them. Focus is mentioned, but shifts frequently, making the purpose unclear. Possible inappropriate shifts in audience.	Consistent effort to address assignment. Thesis/focus is generally clear, may be lost at times. Writes with an eye to audience, but some inconsistencies are evident.	The assignment is addressed. Thesis/focus is identifiable throughout the essay, but occasionally strays off topic. Seems aware of the audience's expectations and attempts to cater the prose accordingly.	Assignment's goals are shared by the writer, though the writer does not seem confined by them. Fully controls thesis throughout the essay and consistently meets the audience's expectations.
Synthesis: Organizes texts/ideas/ information into a cohesive, organized discussion (both globally and locally).	No attempt to synthesize texts/ideas; organization feels random making cohesion impossible.	Preliminary attempts to synthesize texts/ideas; discussion feels unorganized at times. Yet, some paragraphs/sections hold together.	Some attempts to synthesize complex texts/ideas, but cannot sustain the effort. Global organization is clear, but local organization may stray.	Synthesizes texts/ideas with some expertise and begins to formulate a cohesive look at the topic, but lacks some sophistication. Some missteps with organization.	Synthesizes texts/ideas with expertise and formulates a sophisticated, complex discussion of the topic. Organization feels deliberate and complements the topic.
Support: Assertions and/or conclusions are fully developed and are based on appropriate evidence.	Assertions and/or conclusions are difficult to locate and are unsupported. Needless repetition takes the place of development.	Assertions and/or conclusions are identifiable, but are not supported by evidence. Some repetition persists and makes reading difficult at times.	Assertions and/or conclusions are occasionally supported by evidence. Some generalities persist.	Clear assertions/conclusions are made; evidence is usually used effectively, but some errors in logic are detectable. Development aided by the inclusion of some key details.	Makes fully developed assertions and/or draws logical conclusions that are supported by the evidence. Consistently includes details that point to the complex nature of the topic.
Style: Writing is stylistically complex (i.e. sentence structure, word choice, transitions, tone, and paragraphing).	Simple sentences and word choice; paragraphs break randomly and may lack topic sentences.	Attempts at complex sentences/ language and deliberate paragraph breaks, but awkward moments persist.	Demonstrates some adeptness when making stylistic choices, but style lacks consistency and refinement.	Generally writes with complex sentence structure and language; evidence of stylistic complexity.	Evidence of consistent, deliberate, and refined stylistic presence on the page.
Mechanics: Writing is free of spelling and punctuation errors. Content is clearly expressed.	Pervasive errors distort meaning and make reading difficult.	Some errors are significant and detract from the meaning. Piece requires closer editing.	Some errors impede reading but the content is generally clear.	Minor errors are present, but not too distracting. Content is clear.	The writing is near perfect with almost no errors.

Figure 1.5: Percentages and Mean Scores for ULO Project on Oral Communication Traits

Trait	N	Insufficient/Below Average	Average	Good	Excellent	Mean	Standard Deviation
Use of Supporting Material	102	13.7%	35.3%	45.1%	5.9%	3.42	.83
Language Use	102	7.8%	56.9%	29.4%	5.9%	3.33	.71
Central Message	102	11.8%	47.1%	37.3%	3.9%	3.31	.78
Organization	102	10.8%	57.8%	27.5%	3.9%	3.24	.70
Nonverbal Delivery	102	23.5%	49.0%	25.5%	2.0%	3.06	.75
Verbal Delivery	102	22.5%	50.0%	25.5%	2.0%	3.03	.83
Use of Visual Aids*	75	16.7%	26.5%	22.5%	7.8%	3.27	.99

* Not all students used visual aids.

ULO Oral Communication Rubric (Figure 1.5a)

Speaker _____ Class: _____ Time: _____

1. Verbal Delivery

1	2	3	4	5
<p>Delivery detracts from the presentation. (e.g., rate too fast/slow, monotone, inaudible, disfluent, many vocalized pauses). Speaker is visibly uncomfortable or unprepared.</p>		<p>Delivery makes the presentation understandable but there are some delivery difficulties (e.g., lacking expressiveness, some disfluency). Speaker is somewhat tentative.</p>		<p>Delivery makes the presentation compelling (e.g., appropriate rate, dynamic, good volume, fluent). Speaker is polished & confident.</p>

2. Nonverbal Delivery

1	2	3	4	5
<p>Eye contact visible 0-30% of the time. Gestures and/or posture distract the audience. Inappropriate attire detracts</p>		<p>Eye contact visible/generalized 40-60% of the time. Gestures, posture, and/or nonverbal appearance are satisfactory.</p>		<p>Eye contact sustained & generalized 70% or more of the time. Gestures, posture and/or nonverbal appearance enhances speech.</p>

3. Central Message

1	2	3	4	5
<p>Presents vague, lackluster, and forgettable message. Message is uninteresting.</p>		<p>Presents understandable but not particularly compelling, or memorable message. Message is ordinary.</p>		<p>Presents clear, compelling, and memorable message. Message is interesting.</p>

4. Organization

1	2	3	4	5
<p>Presents info without a logical sequence. Audience has difficulty following the presentation. Intro, body, transitions & conclusion are not observable. Speaker jumps around.</p>		<p>Presents info in an intermittently logical sequence making the content somewhat cohesive. Intro, body, transitions & conclusion are somewhat observable.</p>		<p>Presents info in a logical & thoughtful sequence making the content cohesive. Intro, body, transitions & conclusion are clearly observable. Audience can easily follow the presentation.</p>

5. Language Use

(Figure 1.5a)

1	2	3	4	5
Language is misused, vague, unimaginative, unclear, not compelling . Language is inappropriate for the audience. Errors in grammar and/or pronunciation are observed throughout.		Language is commonplace & mundane but understandable and somewhat appropriate to the audience. Grammar and pronunciation are acceptable.		Language is imaginative, clear, memorable, descriptive & thoughtfully tailored to the audience . Correct grammar & pronunciation are observed throughout.

6. Use of Supporting Material

1	2	3	4	5
Presents insufficient supporting material (e.g., explanations, examples, illustrations, statistics, analogies, quotations) that minimally supports the presentation.		Presents some supporting material (e.g., explanations, examples, illustrations, statistics, analogies, quotations) that partially supports the presentation.		Presents a variety of supporting material (e.g., explanations, examples, illustrations, statistics, analogies, quotations) that significantly supports the presentation.

7. Visual Aid Use Yes→(if yes, please circle 1-5) No____(if no, skip this item)

1	2	3	4	5
Visuals or props are hard to see, unprofessional, unclear or irrelevant .		Visuals or props are satisfactory but mediocre and not compelling.		Visuals or props are clear, professional, vivid, memorable and enhance the presentation.

Suggestions for Improvement:

- 1) _____
- 2) _____
- 3) _____

Things you did well and should strive to continue:

- 1) _____
- 2) _____
- 3) _____

Figure 1.6. Numbers of ULO Project on Diversity Participants across All Traits as a Function of College and Class Level

Class Year	CAED	CAFES	CENG	CLA	OCOB	COSAM	TOTAL
Freshman	8	15	29	29	3	18	102
Junior	1	11	3	14	15	12	56
Senior	1	4	9	6	8	16	44
<i>TOTAL DLO 1</i>	<i>10</i>	<i>30</i>	<i>41</i>	<i>49</i>	<i>26</i>	<i>46</i>	<i>202</i>
Freshman	13	17	19	19	6	49	123
Junior	3	11	6	13	22	3	58
Senior	4	7	8	13	7	17	56
<i>TOTAL DLO 2</i>	<i>20</i>	<i>35</i>	<i>33</i>	<i>45</i>	<i>35</i>	<i>69</i>	<i>237</i>
Freshman	8	16	17	16	4	35	96
Junior	1	11	6	14	25	8	65
Senior	4	8	11	18	10	16	67
<i>TOTAL DLO 3</i>	<i>13</i>	<i>35</i>	<i>34</i>	<i>48</i>	<i>39</i>	<i>59</i>	<i>228</i>

Figure 1.7. Mean Scores and Distribution of Scores by Various Student Categories on DLO 1

Student Category		No Response	Incomplete	Basic	Moderate	Complex	
Class Level	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
Freshmen	102	16.7%	53.9%	27.5%	2.0%	0.0%	1.56
Juniors	56	10.7%	42.9%	33.9%	12.5%	0.0%	1.93
Seniors	44	15.9%	27.3%	36.4%	18.2%	2.3%	2.04
College	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
CAFES	30	30.0%	50.0%	16.7%	3.3%	0.0%	1.29
CAED	10	30.0%	40.0%	30.0%	0.0%	0.0%	1.38
CENG	41	19.5%	34.1%	39.0%	7.3%	0.0%	1.81
CLA	49	12.2%	55.1%	28.6%	4.1%	0.0%	1.71
OCOB	26	3.8%	30.8%	38.5%	23.1%	3.8%	2.34
COSAM	46	6.5%	50.0%	32.6%	10.9%	0.0%	1.88
Gender	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
Female	103	22.3%	43.7%	28.2%	5.8%	0.0%	1.62
Male	99	7.1%	46.5%	34.3%	11.1%	1.0%	1.93
Ethnicity/Race	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
Asian	20	25.0%	90.9%	9.1%	0.0%	0.0%	1.81
Hispanic/Latino	11	0.0%	26.6%	50.5%	14.7%	0.9%	1.73
Multi-Racial	28	2.6%	25.6%	46.2%	23.1%	2.6%	1.95
White	129	14.0%	40.3%	36.4%	8.5%	0.8%	1.82
Other*	14	28.6%	50.0%	14.3%	7.1%	0.0%	1.41
Survey Type	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
In-Class	106	21.7%	53.8%	23.6%	0.9%	0.0%	1.46
	96	7.3%	35.4%	39.6%	16.7%	1.0%	2.11

*Aggregates across responses of African-American, Native American, Other/Unknown, and Non-Resident Alien

Figure 1.8. Mean Scores and Distribution of Scores by Various Student Categories on DLO 2

Student Category		No Response	Incomplete	Basic	Moderate	Complex	
Class Level	N	0	1	2	3	4	Mean
Freshmen	123	17.9%	54.5%	26.8%	0.8%	0.0%	1.55
Juniors	58	15.5%	37.9%	34.5%	12.1%	0.0%	1.90
Seniors	56	10.7%	41.1%	32.1%	14.3%	1.8%	1.98
College	N	0	1	2	3	4	Mean
CAFES	35	28.6%	45.7%	17.1%	8.6%	0.0%	1.48
CAED	20	5.0%	65.0%	25.0%	5.0%	0.0%	1.74
CENG	33	12.1%	69.7%	15.2%	3.0%	0.0%	1.51
CLA	45	22.2%	42.2%	31.1%	4.4%	0.0%	1.60
OCOB	35	17.1%	37.1%	31.4%	14.3%	0.0%	1.94
COSAM	69	8.7%	40.6%	43.5%	5.8%	1.4%	1.97
Gender	N	0	1	2	3	4	Mean
Female	117	13.7%	53.0%	26.5%	6.0%	0.9%	1.68
Male	120	17.5%	41.7%	33.3%	7.5%	0.0%	1.80
Ethnicity/Race	N	0	1	2	3	4	Mean
Asian	25	16.0%	52.0%	28.0%	0.0%	4.0%	1.73
Hispanic/Latino	19	5.3%	57.9%	26.3%	10.5%	0.0%	1.88
Multi-Racial	27	7.4%	59.3%	33.3%	0.0%	0.0%	1.68
White	143	16.8%	42.0%	32.2%	9.1%	0.0%	1.78
Other*	23	26.1%	52.2%	17.4%	4.3%	0.0%	1.46
Survey Type	N	0	1	2	3	4	Mean
In-Class	92	21.7%	58.7%	18.5%	1.1%	0.0%	1.45
Online	145	11.7%	40.0%	37.2%	10.3%	0.7%	1.92

*Aggregates across responses of African-American, Native American, Other/Unknown, and Non-Resident Alien

Figure 1.9. Mean Scores and Distribution of Scores by Various Student Categories on DLO 3

Student Category		No Response	Incomplete	Basic	Moderate	Complex	
Class Level	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
Freshmen	96	29.2%	45.8%	19.8%	5.2%	0.0%	1.44
Juniors	65	12.3%	32.3%	44.6%	10.8%	0.0%	2.06
Seniors	67	6.0%	29.9%	44.8%	19.4%	0.0%	2.19
College	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
CAFES	35	22.9%	51.4%	25.7%	0.0%	0.0%	1.46
CAED	13	30.8%	53.8%	15.4%	0.0%	0.0%	1.38
CENG	34	32.4%	35.3%	23.5%	8.8%	0.0%	1.60
CLA	48	14.6%	27.1%	45.8%	12.5%	0.0%	2.00
OCOB	39	5.1%	25.6%	46.2%	23.1%	0.0%	2.33
COSAM	59	13.6%	42.4%	32.2%	11.9%	0.0%	1.84
Gender	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
Female	104	20.2%	43.3%	31.7%	4.8%	0.0%	1.66
Male	124	15.3%	32.3%	36.3%	16.1%	0.0%	1.99
Ethnicity/Race	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
Asian	26	11.5%	38.5%	22.6%	9.7%	0.0%	2.02
Hispanic/Latino	31	29.0%	38.7%	22.6%	9.7%	0.0%	1.66
Multi-Racial	31	12.9%	41.9%	29.0%	16.1%	0.0%	1.99
White	128	17.2%	32.8%	39.1%	10.9%	0.0%	1.85
Other*	12	16.7%	66.67%	16.67%	0.0%	0.0%	1.36
Survey Type	<i>N</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Mean</i>
In-Class	109	28.4%	46.8%	20.2%	4.6%	0.0%	1.46
Online	119	7.6%	28.6%	47.1%	16.8%	0.0%	2.18

*Aggregates across responses of African-American, Native American, Other/Unknown, and Non-Resident Alien

Figure 1.10. Mean Response Results for Selected Information Literacy Items as a Function of Class Level and Library Instruction on Research Methods

1. Which of the following is the most promising research question/most appropriate thesis statement for your paper?						
Class Level**	<i>n</i>	Instruction**	SD	<i>n</i>	No Instruction	SD
Lower Division	175	.691	.463	112	.652	.478
Upper Division	249	.831	.375	262	.737	.441
2. Of the searches listed below, which will get you the MOST results?						
Class Level*	<i>n</i>	Instruction	SD	<i>n</i>	No Instruction	SD
Lower Division	172	.546	.499	107	.570	.497
Upper Division	247	.636	.482	260	.612	.488
3. The same searches are listed again here. Which will get you the FEWEST total results?						
Class Level**	<i>n</i>	Instruction	SD	<i>n</i>	No Instruction	SD
Lower Division	171	.690	.464	107	.664	.474
Upper Division	247	.793	.406	261	.774	.419
4. Examine this citation [citation given]. Is this citation for ...?						
Class Level**	<i>n</i>	Instruction**	SD	<i>n</i>	No Instruction	SD
Lower Division	169	.432	.497	99	.303	.461
Upper Division	242	.550	.499	251	.478	.500
5. When is it ethical to use the ideas of another person in a research paper?						
Class Level	<i>n</i>	Instruction	SD	<i>n</i>	No Instruction	SD
Lower Division	168	.911	.286	101	.891	.313
Upper Division	240	.892	.310	249	.901	.297

* $p = .08$, ** $p < .05$ for main effects of Class Level (lower division vs. upper division) and/or Instruction (instruction vs. no instruction)

Figure 1.11. Numbers of ULO Project on Ethics Participants as a Function of College and Class Year

Class Year	CAED	CAFES	CENG	CLA	OCOB	COSAM	TOTAL
First Year	3	4	7	11	5	3	33
Second Year	3	6	17	8	8	6	48
Third Year	5	4	43	5	9	22	88
Fourth Year	6	3	26	5	20	9	69
Fifth Year	4	1	11	1	2	7	26
TOTAL	21	18	104	30	44	57	264

Figure 1.12. Ethical Learning Outcome Scores as a Function of Class Year

Class Year	N	Mean Total Score
First Year	33	11.36
Second Year	48	12.82
Third Year	88	11.97
Fourth Year	69	12.83
Fifth Year	26	13.77

Figure 1.13. Ethical Learning Outcome Scores as a Function of College

College	N	Mean Total Score	Mean Rank
CAED	21	11.86	123.86
CAFES	18	10.78	103.03
CENG	104	11.99	126.01
CLA	30	11.97	122.63
OCOB	44	12.36	131.88
COSAM	47	14.74	168.88

Figure 1.14. Ethical Learning Outcome Scores as a Function of Trait and Ethics Course Enrollment

Trait	Had not taken a university-level ethics course		Had taken a university-level ethics course	
	Mean Score (<i>n</i> = 112)	Standard Deviation	Mean Score (<i>n</i> = 152)	Standard Deviation
Understanding Different Ethical Theories/Concepts	.339	.164	.376	.171
Ethical Issue Recognition	.397	.214	.395	.203
Application of Ethical Theories/Concepts	.464	.225	.437	.229
Evaluation of Different Ethical Perspectives/Concepts	.435	.262	.429	.252

Figure 1.15. Employer Survey Results for Overall Graduate Quality and Industry Readiness

College	Academic Year	Graduate Quality	Industry Readiness
OCOB - college-wide	2007	4.53	NA
CENG - college-wide	2007	4.46	4.20
CAED - college-wide	2007	4.24	4.25
OCOB - college-wide	2009	4.20	3.92
CENG - college-wide	2009	4.49	4.24
CAFES - Graduate Programs	2010	4.57	4.62
CAFES – NRM	2010	4.25	4.24
CLA – GRC	2010	4.26	4.26