

## **How Are We Doing? Assessing a Writing-Intensive Introductory Humanities and Social Sciences Course**

**Barbara M. Olds**  
**Colorado School of Mines**

Nature and Human Values (NHV) is a required, 4-credit, writing-intensive class, the first course in the humanities and social sciences core at the Colorado School of Mines (CSM). The course is, according to the common syllabus, “designed to introduce prospective engineers, applied scientists, and economists to the inextricable, complex, and dynamic interrelationships that exist between and among human systems and environmental systems. . . .Special attention is given to exploring the ethical responsibilities of engineers in meeting their chief duty—insuring public health, welfare, and safety.”

As part of the pilot offering of Nature and Human Values, the Division of Liberal Arts and International Studies conducted a thorough assessment of the course. NHV was offered for the first time in the fall of 1997 to two-thirds of the incoming freshman class, approximately 350 students. The class was offered using two models for comparison purposes. In the first model, two faculty members taught large lecture classes (on the order of 150 students) which met twice a week and were linked with 2-hour writing-intensive recitation sections. The recitations had no more than 20 students and were taught by writing specialists. Three other faculty offered small (20 person) combination lecture/recitation sections which met with the same instructor for 4 hours each week and covered both writing and content. Our assessment goal was to gather baseline data in the following three areas for both formative (mid-course correction) and summative (overall evaluation) purposes:

- Content knowledge—how well were students able to meet the content objectives outlined in our common syllabus?
- Writing ability—how well were students able to meet the writing objectives outlined in our common syllabus?
- Student perceptions and attitudes about the Nature and Human Values course.

In order to measure these goals we used the following assessment measures:

- Common questions on exams
- Frequent meetings of the NHV faculty to discuss course philosophy and content
- A holistic grading session of writing samples
- Collection of final argument papers as part of the CSM portfolio assessment program
- Focus groups with students at midterm and end of semester
- A survey distributed to all NHV students near the end of the semester

Several clear conclusions arose from these assessments:

- Students understood the goals and objectives of the course.
- When they expressed a preference, students generally favored the combination sections over the large lecture/recitations.
- Students' writing skills (especially technical writing) improved.
- The work load was too heavy and readings were perceived as repetitive.
- The lecture and recitation were generally not perceived by the students to be closely connected.
- The texts were generally effective.

Each of these conclusions will be discussed briefly below. While the majority of the feedback came too late to allow sweeping changes for spring 1998, the course was modified where possible to address concerns. Additional assessment during the spring and summer of 1998 will lead to broader revision over the summer for implementation in fall 1998.

### **Student Understanding of Course Objectives**

The faculty involved in developing and piloting NHV worked hard to achieve a common set of objectives for the course which were then clearly outlined to the students. These objectives (both for content and for writing) were articulated to the students in the common syllabus and in the course lectures. They are discussed in detail in the other papers from this session. When we conducted focus groups with students in 8 recitation sections and asked them what the course was about, students were consistently able to articulate the overall course objectives using statements such as “the purpose of the course is to make us aware of the environment and how we fit in with it” and “to teach engineers to be responsible for our actions and committed to the world around us.” A minority of students perceived the course as a “podium” for a particular set of beliefs; one of these students articulated the course purpose as “learning that we’re selfish, materialistic, and foolish.” On the survey, the statement “Contradictory viewpoints held by various authors are treated fairly by the instructor” received an average response of 2.4 on a 5-point scale where 4 = strongly agree, 3 = agree, 2 = neutral, 1 = disagree, and 0 = strongly disagree. On the same scale, the average response to the statement “The course objectives agree with what is actually taught” was 2.6.

The NHV faculty strongly believe that the course should present a variety of viewpoints and encourage students to make up their own minds about difficult nature/human interaction issues. The common syllabus is being scrutinized to assure that readings are balanced, and writing assignments continue to encourage students to explore a variety of points of view on controversial issues. We are aware, however, that the content of this course by its very nature—much like the world of human-environment interactions that we live in—can be disquieting. Freshman students often want clear and precise solutions to complex, dynamic problems about

which there is a great deal of scientific uncertainty and a wide array of conflicting perspectives. That humans with differing cultural, political, and economic perspectives can widely differ on the nature of the problem—indeed, even whether there is a problem—as well as the nature of potential alternative solutions, can also be unsettling. This course is designed to contribute to deepening student understanding and broadening student awareness of differing views. Ironically, part of the mixed student response to NHV may stem from this.

### Small vs. Large Sections

When asked to “rate this course overall,” students responded as follows:

**Figure 1. Rate Course Overall**

Class	Percent	Percent	Percent	Percent	Percent	Average Score
	4-Excellent	3-Above Average	2-Average	1-Below Average	0-Poor	
Large Lecture #1	4	13	32	28	23	1.5
Large Lecture #2	1	16	32	33	18	1.5
Combo Section #1	0	29	43	21	7	1.9
Combo Section #2	0	50	36	14	0	2.4
Combo Section #3	20	27	33	20	0	2.5

There is clear evidence that students prefer smaller classes for this type of course. While only 17 percent of the students in the large lectures rated the course at least “above average,” 42 percent of the students in the combination sections did. Approximately the same percentages (32 for large lectures, 37 for combination sections) rated the course “average,” but 51 percent rated the large lectures “below average” while 21 percent of those in the small sections did. One clear advantage of the small sections is the students’ opportunity to discuss course content regularly. We continue to experiment with various configurations; in the spring of 1998 two 40-person lectures were used in addition to a large lecture. Recitation sizes continued at 20. The relative effectiveness of the 40 person sections will be assessed as the decision is made about how to best configure the course for the future.

### Improvement of Writing Skills

Although the writing samples collected from NHV as part of CSM’s overall portfolio assessment program will not be evaluated until summer 1998, considerable evidence exists that students’ writing improved as a result of the writing-intensive elements of the course. Writing objectives are discussed in some detail in Jon Leydens’ paper from this session. All students learned about

and practiced writing memos, abstracts, arguments and engineering reports. In the focus groups, most students were positive about the writing portion of the class. They agreed that they were learning technical writing conventions that they will need and that the recitation instructors were knowledgeable, helpful, and available. Several commented that they were already putting their technical writing skills to use in EPICS, our introductory engineering problem-solving course. NHV faculty, especially writing program administrator Jon Leydens, have been working closely with EPICS to assure that writing instruction is consistent. The CSM Writing Center and its computer classroom were used extensively by NHV students and faculty during the fall semester. The number of students requesting assistance in the Writing Center of their own volition doubled over the previous semester. The Writing Center's computer classroom was used extensively to help NHV students learn to use e-mail, user groups, and internet search engines.

To help assure consistency of standards in grading written assignments, we held a holistic norming session at approximately midterm. All writing instructors were invited to the 4-hour session; nearly all attended. They scored a series of papers using a 9-point rubric and achieved remarkable consistency on their marks. In fact, on a sample of six papers each scored by 9 raters, in only four cases was any individual's rating more than one point different from other raters'. Faculty also generally agreed on the amount of writing required for the semester—approximately 16 pages (not including multiple revision opportunities).

On the survey, students provided the following responses to a series of questions about writing (5-point scale from 4 = strongly agree to 0 = strongly disagree):

- The writing assignments helped me to think more analytically (2.5)
- I have learned to write more effectively because of this course (2.5)
- I am more confident as a writer now than I was before taking this course (2.4)
- I have learned to see my own writing problems and work towards solving them (2.6)
- This course has enabled me to write for a variety of audiences and purposes (2.5)
- I have improved my own writing processes (2.6)

We plan to use these responses as well as feedback from a summer 1998 evaluation by the CSM assessment committee to improve the writing component of NHV. We will also conduct interviews with faculty who teach our sophomore EPICS course to compare the writing of students who have taken NHV to the writing of previous classes. Writing instructors will continue to revise assignments to better meet course objectives.

### **Heavy Work Load**

When focus groups were conducted at mid-semester, many students complained that the reading and writing load in NHV was too heavy. In addition, they argued that the readings were often repetitive. While the faculty believe that multiple articles covering a particular topic were often

subtly different, they concede that many first year students may not be developmentally mature enough to appreciate such subtlety.

The following survey questions relate to the work load in NHV (5-point scale from 4 = strongly agree to 0 = strongly disagree):

- In terms of this course, I have put in above-average effort (2.7)
- Appropriateness of the course level for the stated objectives (2.3)
- I have completed all the reading assignments on time (1.6)
- The writing required for this course is 4-excessive, 3-slightly excessive, 2-neither excessive nor too light, 1-slightly too light, 0-too light (2.9)
- The reading for this class is 4-excessive, 3-slightly excessive, 2-neither excessive nor too light, 1-slightly too light, 0-too light (3.4)

NHV faculty have re-examined the common syllabus and have agreed to eliminate some readings which could be perceived as repetitive. In addition, most faculty teaching the course in fall semester 1997 adjusted the work load following the midterm feedback, a response that was greeted with gratitude by the students in the end-of-semester focus groups. Both content and writing portions of the course were adjusted for spring semester based on this feedback. We need to continue to monitor the work in NHV and make sure it is consistent with other 4-credit courses at CSM.

### **Lack of Connection Between Lecture and Recitation**

In the focus groups nearly all of the students in the large lecture/small recitation format agreed that they saw very little connection between the lecture and recitation. A typical comment was “it’s really two two-credit courses.” Students commented that they were given little or no opportunity to discuss the readings and lectures except in one lecture section. Those in the small combination classes felt that connections were made much more consistently. Many students argued in favor of such combination classes or smaller lectures. Others suggested adding a 5<sup>th</sup> credit for a “real” recitation. Of major concern, students reported attendance in the large lectures at around 60 percent on average.

Some students expressed concern that the multiple choice/true-false exams which accounted for 40 percent of their combined course grade measured only recall. On the survey question “Examinations cover important rather than trivial course material” the average response was 2.1 on a 5-point scale, and on the statement “Tests require the students use learned material in new or innovative ways, rather than reproduce types of problems used in class or homework,” the average response was 1.8.

We need to continue to explore ways in which to maximize both resources and effective delivery. We are also exploring the possibility of including essay questions on the exams and developing writing assignments that tie directly to the lectures. These options may become more viable as lecture faculty are required to spend less time developing course materials.

### **Effectiveness of Texts**

The major texts for the course<sup>1,2,3</sup> were generally positively reviewed by students, despite the complaints about redundancy noted above. The technical writing text<sup>4</sup> was very well thought of. Some faculty had reservations about the novel selected for the course, Achebe's *Things Fall Apart*<sup>5</sup>. Although all agreed that it is an excellent work of fiction, there was some disagreement about how well it met course objectives. There was also concern by faculty about the lack of appropriate texts for the historical portion of the course (Unit II). When asked to rate the effectiveness of texts for the course (4 = too easy, 3 = easy, 2 = OK, 1 = advanced, 0 = too advanced), the average student response was 1.8. The texts for spring 1998 remained the same, though we continued to search for a replacement novel and suitable history text.

### **Changes Implemented for the Spring 1998 Version of NHV**

Both the lecture and writing portions of the course were modified for spring 1998. The overall workload in the writing-intensive recitations was made more coherent by focusing on fewer projects while still introducing students to a variety of genres. The majority of the lecture instructors cut back on the number of readings. Recitation and lecture faculty are working together to make the connections between the two parts of the course more solid.

### **Conclusions**

Based on our experiences with developing, implementing, and assessing a pilot writing-intensive, introductory humanities and social sciences course for engineers, we have reached the following conclusions and recommendations:

1. We need to settle on the optimum class size and structure. The large recitations, while efficient in terms of faculty use, may not be the best approach pedagogically. The 40 student lecture/20 student recitation format seems to have promise.
2. We need to explore the possible use of engineering case studies and participation of engineers, both from the CSM faculty and from industry. This approach would perhaps promote more "buy in" to the course from both students and faculty from the engineering disciplines. Practicing engineers may be the best people to convince first year students that issues such as ethics and stewardship of the earth are indeed important in their careers as well as their personal lives.
3. We need to explore the best way to deal with students who have serious remedial needs in writing. While there are not many such students, we have no special provisions for them, nor

for ESL students. The Writing Center is a source for remedial help, but we also need to explore offering special sections of NHV for such students.

4. We need to assure that connections are made whenever possible and reasonable between the lecture and recitation portions of the course. Too many students felt that they were taking two separate courses in the pilot version. We are exploring ways in which to incorporate writing into the lectures (freewriting, journals, minute papers, etc.) as well as ways to include more discussion and writing about lecture topics in the recitations.

We have learned the hard way that developing and piloting a new, non-traditional course (in both content and delivery mode) is an extremely intensive, time-consuming enterprise for the faculty involved. However, we believe that we are in the process of implementing a course that will provide a solid foundation for CSM students in both communication skills and knowledge of the role that humanities and social sciences play in their personal and professional lives.

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BARBARA M. OLDS is professor of liberal arts and international studies and principal tutor of the McBride Honors Program at the Colorado School of Mines. She chairs CSM's assessment committee and was a member of the faculty team which developed the Nature and Human Values course.