

An Assessment Report to the Faculty Senate by the General Education Committee April 17, 2008

The Faculty Senate has charged the General Education Committee with the responsibility of providing assessment of general education goal outcomes at the institutional level. The intent of the assessment is to provide course instructors with additional information to improve student learning across a common spectrum of knowledge and skills, thus providing students with a common basis for a lifetime of individual development as civic and contributing members of society.

The spectrum of knowledge and skills that we want students at Indiana University Southeast to develop is defined in the 11 general education goals listed below.

- (1) Quantitative Reasoning
- (2) Oral Communication
- (3) Written Communication
- (4) Diversity
- (5) Ethical Reasoning
- (6) Information Literacy
- (7) Critical Thinking
- (8) Central Issues, Ideas, and Methods of Inquiry (CIIMI) in Arts and Humanities
- (9) CIIMI in Natural and Physical Sciences
- (10) CIIMI in Social and Behavioral Sciences
- (11) Information Technology Fluency

In consideration for the difficulty of the assessment task, the General Education Committee has decided to divide the 11 general education goals into three groups. Each group of general education goal outcomes is assessed in a different year on a 3-year cycle.

Assessment Period	General Education Goals to be Assessed
2006-07	Quantitative Reasoning Oral Communication Written Communication
2007-08	Diversity Ethical Reasoning Information Literacy Critical Thinking
2008-09	CIIMI in Arts and Humanities CIIMI in Natural and Physical Sciences CIIMI in Social and Behavioral Sciences Information Technology Fluency

The General Education Committee started the assessment process last academic year (2006-07) and so we are in the middle of the assessment cycle. At the beginning of the 2007-08 Academic Year, the Committee formed four working groups to assess the general education goals of diversity, ethical reasoning, information literacy, and critical thinking. The members of the assessment groups are as follows:

The Diversity Assessment Group is comprised of Donna Bowles (Gen Ed Committee representative), Stephanie Bower, Greg Phipps, and Samantha Early.

Members of the Critical Assessment Group are Robin Morgan (Gen Ed representative), Linda Gugin, and Jon Bingham

Nancy Totten (Gen Ed representative), Diane Reid, Maria Accardi, and Melanie Hughes serve on the Information Literacy Assessment Group.

Membership of the Critical Thinking Group is comprised of Tom O'Neal, George Harvey, and Jim St. Clair

A Summary of Reports from the Assessment Working Groups

(1) Diversity Assessment Group

Following the guidelines from the General Education *Basic Assessment Structure*, the group's goal was to: a) use original student work, b) maintain anonymity of students/faculty assessed and c) use a manageable sampling technique. Due to the Diversity Goal criteria having only four student learning outcomes, the group decided to assess all of them, deeming each as having equal importance. Those criteria are:

- A) In both western and non-western contexts, cultural markers such as race, gender, ethnicity, religion, sexual orientation, age and disability help explain ones perspective on a variety of issues.
- B) Differences and commonalities among two or more cultures.
- C) Cultural context influences how one perceives those who are different from oneself.
- D) Impact of personal and systemic discrimination, prejudice and stereotypes.

A request was made to have multiple courses and sections participate in the assessment during the Fall 2007 semester in order to obtain a sample size of at least 500 students. All participating courses used a common assessment tool presenting diversity scenarios, which required the student to match the four diversity goals to the appropriate scenario. Each faculty member participating was asked to send their proposed scenarios to the committee in advance to assure compliancy.

Data collection method

All instructors participating chose to have the assessment either be a part of an actual exam or administered as a single activity for extra credit, believing students would put forth more effort than if it were a 'voluntary' exercise. Answers matching the scenarios were marked on a scantron. Every course keyed the correct responses identically which made running the scantrons for totals a simple process. The Diversity Group had pre-set a goal of 70% minimum correct responses, believing this correlated to a satisfactory result.

Results of the Assessment

Following are the average scores for the diversity criteria assessed (Outcome A measured twice with different scenarios)

Scenario Number w/ corresponding Diversity Outcome	Mean score N = 579
1 - D	76.22%
2 - B	84.96%
3 - A	63.46%
4 - C	66.95%
5 - A	58.91%

Discussion

As noted in the table, three of the five areas of assessment did not reach the pre-determined goal of 70%. The Diversity Group speculated on various reasons for this outcome: Students not understanding the meaning of the diversity criteria; perhaps some scenarios were presented at too high of a cognitive level for 100/200 level courses; the activity wasn't taken seriously in the courses where extra credit was granted for completion. In addition, after running the 579 scantrons, it appeared a group of approximately 30 might have been keyed differently from the others (in an effort to keep anonymity, no identifying information was able to substantiate this) which affected the mean scores.

(2) Ethical Reasoning Assessment Group

Part 1 -- Philosophy

This report is a reflection of the efforts on the part of the Philosophy Program to implement a meaningful assessment procedure that will determine how well students are meeting the learning objectives specified by the 'Reasoning about Ethical Questions' General Education requirement. The process described below represents an initial attempt on the part of the program to assess student learning, and should therefore be read with the understanding that they are intended to provide a benchmark by which we can compare future assessments. In addition, the data obtained in this process has served to identify areas of strength, weaknesses, and areas relative inconsistency across sections in meeting certain objectives. This information will provide a basis for changes in how the relevant courses are taught in subsequent semesters.

Method

Because the learning objectives for 'Reasoning about Ethical questions' are not content specific, we chose a method of assessment that would allow maximum flexibility in the selection of course content across sections. To this end, the assessment tool devised for this process consists of a checklist of the objectives re-formulated with a view to the specific learning goals that define the two course covered in this process: P100 – *Introduction to Philosophy*, and P140 – *Introduction to Ethics*. Since both courses are required to meet the same objectives, the same check sheet was used despite the differences in emphasis on ethics in each course. The re-formulated objectives are as follows:

1. Explain and evaluate several key moral principles and ethical theories.

- A. Students will describe the distinguishing features of a range of ethical principles and theories.
- B. Student will identify the strengths and weaknesses of different principles and theories.

2. With respect to a particular moral issue, evaluate alternative positions using appropriate principles or theories and articulate the ramifications and consequences both of alternative courses of action and of the acceptance of different moral principles and ethical theories.

- A. Students will describe a moral problem, identifying features of the problem that are of moral relevance.
- B. Students will show how different theories or principles would apply to the problem.
- C. Students will provide a sound justification for preferring one theory or principle over the alternatives.

3. Engage in moral discussions constructively and effectively.

- A. Students will demonstrate full understanding of the implications of a position they take on an ethical issue.
- B. Students will acknowledge the merits of positions opposed to their own.
- C. Students will demonstrate an understanding of the basics of sound philosophical argumentation.

In each of the sections taught, a sample of ten students was determined by selecting every third student on the section roster. For each outcome, student performance is rated ‘Excellent’, ‘Good’, ‘Satisfactory’ or ‘Poor’. Results from each section were submitted to the Coordinator who assimilated them into a body of data for program review. The conclusions that resulted from this review process are in the final section of this report.

Data

Below is a tables summarizing the averages ratings across all sections. Performance ratings were translated into a point scale in order to calculate averages within and across sections, and to identify areas of relative inconsistency by reference to the standard deviations. The point scale is as follows:

Excellent = 3 points; Good = 2; Satisfactory = 1; Poor = 0 points.

Thus, average scores at or above two points are instances where on the whole student performance is assessed as ‘Good’ in meeting the given objective.

	P100's:				P 140's:				
	13154	13156	13994	13153	13600	13411	13158	AVG.	SD
1A	1.90	2.50	1.60	2.00	1.90	2.00	1.80	1.96	0.276026224
1B	1.90	2.50	1.75	1.70	1.90	2.00	1.56	1.90	0.303077978
2A	1.40	1.70	2.10	1.50	1.40	2.30	2.10	1.79	0.376069902
2B	1.40	1.70	2.30	1.40	1.40	1.60	1.40	1.60	0.331662479
2C	1.40	1.70	1.40	1.10	1.40	1.30	1.20	1.36	0.190237946
3A	1.70	2.00	1.50	1.00	1.70	1.80	1.80	1.64	0.32071349
3B	1.70	2.00	1.50	0.80	1.70	2.00	1.56	1.61	0.406516583
3C	1.70	2.00	1.56	0.90	1.70	2.00	1.56	1.63	0.371390131

Conclusions from Analysis of Data:

On the whole, the data indicates that in the view of the instructors, students are meeting all of the learning objectives. Students did best in meeting the first set of objectives (1A and 1B), averaging at or above 1.9. This result is to be expected, since the primary focus in teaching ethics is to present students with a variety of theories and to provide them with a means of differentiating those theories in terms of their relative strengths and weaknesses.

Students also did a relatively good job in areas where they were expected to either apply a theory to a specific problem (2A and 2B), and in all areas relating to the goal of engaging in effective and constructive moral discussions (3A, 3B, and 3C). One area that may require greater attention is in relation to 2C. There seems to be some inconsistency between the relatively high ratings students

received on 3C and the lower ratings they received on 2C. This variance can be explained by the fact that in many cases, instructors used different assignments to assess students in relation to these objectives. It is not surprising, however, that students in introductory level courses have greater difficulty in presenting sound arguments in support of their positions, as very few of them have had the benefit of taking a course like P150. What this result shows is that more attention should be given to the goal of producing sound arguments in these courses. The need for greater focus on these objectives is also evidenced by the relatively high standard deviations for these objectives, indicating that student performance was least consistent from one section to the next. In response, we will consider ways to integrate more instruction in the area of critical thinking into P100 and P140, and use a future assessment cycle to determine the success of our efforts.

In addition, the flexibility afforded to each instructor in choosing the means for measuring student learning has given us some direction in terms of determining what sorts of assignments are best suited to this purpose. In one case, the instructor assumed that the objectives dealing with engaging in constructive and effective moral discussions (3A, 3B, and 3C) would be best measured in the in-class debates he has as one of the major assignments in his sections. Upon review of the way students performed, he felt that his assessment of student performance through that assignment did not accurately reflect the level of student learning evidenced in written assignments. Upon sharing these findings with the other instructors, we were able to make the determination that measurement of these outcomes (and possibly all outcomes) in future assessment cycles will be done through written assignments rather than oral presentations.

Part 2 – Journalism (Senior Seminar in Journalism J485; Seminar in Journalism Ethics J280)

Although listed as separate courses, the two are cross-listed and taught as a single class. The J485 course number is used for journalism majors and J280 for students in the advertising track. The course is normally offered once a year, usually in the spring semester. Two of the major components of the class are a reflective essay that comes toward the end of the semester and is a reflective essay, in which students provide their assessments of the current state of journalism ethics, and a research paper that explores an ethical issue in-depth.

Reflective Essay

This assignment asks students to draw upon readings in the textbook and other material, and class discussions to express their views of the current state of journalism ethics. Students are asked to imagine themselves as editors of medium-sized daily newspapers and the essays as speeches they deliver to new reporters. Using this as a framework, students write about the most valuable lessons they have learned in their detailed study of journalism ethics and then specifically what they would expect new reporters to know about ethics, what these reporters can do to be ethical in their positions, what tricky situations are likely to arise and how they can be handled. Students are also encouraged to cite the philosophies of the great thinkers like Aristotle, Kant and Mill and discuss techniques like the Potter Box to support their points. A class discussion session is also scheduled for students to present the views covered in the reflective essays.

Evaluation of Essays

The essays are graded on a 50-point scale and a holistic approach is used in assigning grades. The essays are evaluated based on how well students understand the various ethical dilemmas that confront journalists, how thorough their understanding of approaches to working through these dilemmas and their use of specific cases that illustrate ethical problems in journalism.

In the journalism program's Annual Assessment and Planning Report for 2006-07, 95.83 percent of students were rated satisfactory or above in exhibiting knowledge of ethical issues as determined by their scores on the reflective essays. One-third of these students achieved a score of excellent.

Conclusion

The holistic approach to assessing ethical reasoning underscores a need for a more formal assessment process. Accordingly, next year we plan to develop a rubric for the self-reflective essay that would better measure student performance on outcome C, which is "engage in moral discussions constructively and effectively." What follows is a preliminary plan for developing a rubric that would assess essays on three basic components.

The essays should reflect a thorough ability to engage in a discussion of ethical issues relevant to journalism. First, this means the student is able to identify and accurately describe ethical issues in journalism. For example, it could be a discussion of how to handle conflicts of interest or choosing between competing loyalties. This is an issue especially relevant for journalists working in small markets where the people who are sources of news can also be those with whom reporters develop social relationships. The dilemma surfaces when it comes time to do the tough stories on people who have also become friends. Conflicts of interest take many other forms as well and reporters need a mechanism for sorting out these conflicts. This introduces a second component of how an essay will be judged and that concerns the writer's ability to reason through a specific situation by being able to apply one or more of the ethical decision-making models covered in the course, through text and class discussions, such as the Potter Box. Because ethics in journalism is a moving target, that is new ones surface frequently or existing ones get recast in unanticipated ways, it is also important that essays reflect a student's knowledge of contemporary examples of ethical issues. For example, technology, continues to introduce new ways of gathering information while at the same time posing new ethical concerns. Reporters can now get information out to the public on Web sites faster than ever, but this also introduces the possibility of error because the time for fact-checking is less and sometimes even absent altogether.

(3) Information Literacy Assessment Group

The primary method of assessing information literacy in the FYS library instruction class is through a pre-test and post-test instrument. The questions are designed to measure these information literacy skills:

- 1) Formulate an appropriate search query in response to an information need.
- 2) Distinguish between the library catalog and an article database, the two main tools used to locate information
- 3) Distinguish between scholarly and popular periodicals
- 4) Interpret a bibliographic record in an article database (Academic Search Premier) and the library catalog (IUCAT)
- 5) Understand the function of the Boolean operator AND in search query formulation

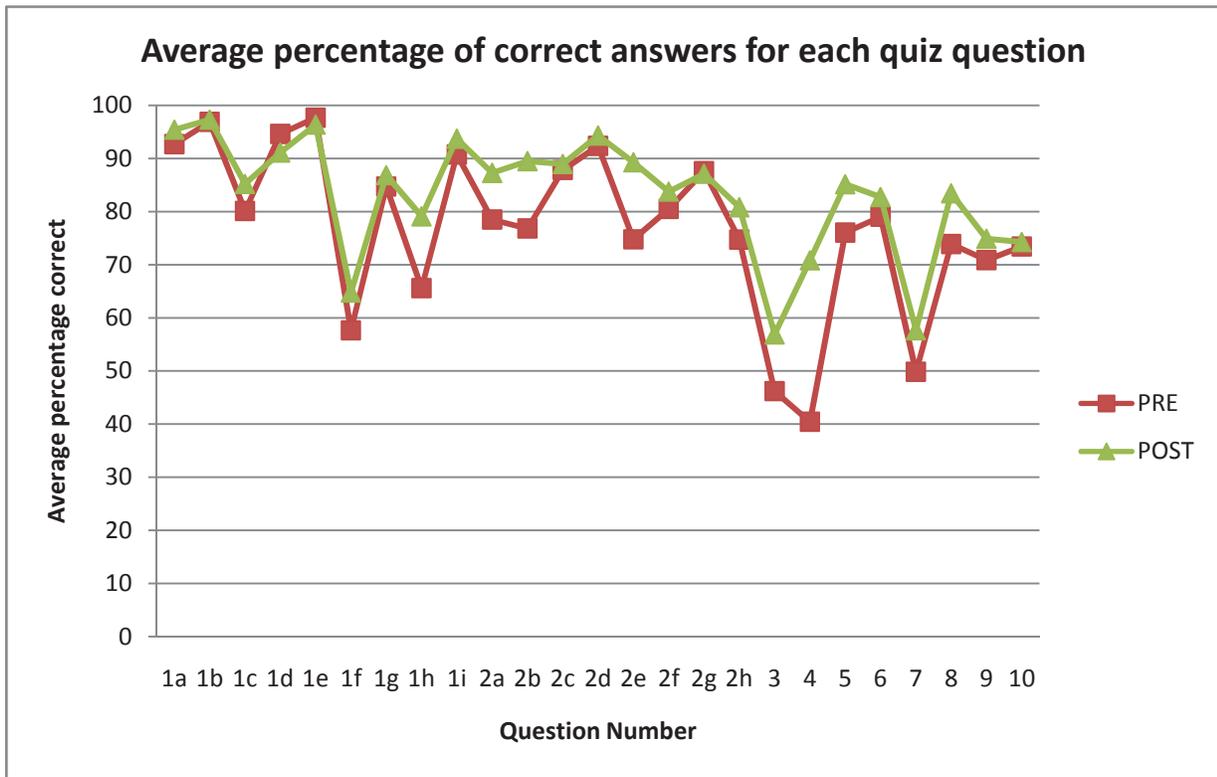
The pre-test was administered at the beginning of the class period, and the post-test was completed at the end of the class. The questions on the pre-test and post-test are identical, and responses to the pre- and post-test quizzes were analyzed in aggregate.

Of the 25 questions, 22 of them showed an increase in correct answers in the post-test quizzes. The most dramatic increase is a 30-point change in Question 4. Question 4 provides the student with a

research scenario--a description of a topic and a list of keywords--and asks the student to choose the best search query to retrieve results on that topic. The primary objective of this question is to determine a student's ability to translate an information need into an effective search query. Students are accustomed to conducting Google searches using a natural language phrase without any Boolean operators, but periodical article databases require a specific search query syntax, and one of the goals of library instruction is to teach students how to formulate these queries. In fact, this question had the lowest number of correct answers in aggregate--40.43%--of all pre-test questions. Thus, a 30-point increase in correct answers on the post-test suggests that search query formulation is perhaps the skill that presents the most significant opportunity for intervention in the information literacy instruction classroom. It also suggests that the way that this concept is being presented is effective, and given that this topic is essential to a student's growth as an information literate researcher, perhaps even more time and practice can be devoted to this topic. This is especially noteworthy, given that informal observations of reference desk transactions also point to the lack of understanding of this skill.

It is difficult to determine why certain questions showed a drop in percentage points in the post-test quiz. Two questions showed a one point or less decrease, but Question 1d showed a 3-point decrease, and thus may warrant more scrutiny than the other two. Question 1d is part of a distinguishing features matrix, and the characteristic presented is: "Articles contain footnotes, bibliographies, or some form of source documentation." Students were asked to choose which type of periodical--scholarly or popular--this characteristic best describes. The difference between scholarly and popular periodicals is a standard concept covered in all FYS library instruction sessions, so the 3-point drop in correct answers in the post-test is puzzling; one would assume that the correct answers should increase. It is possible that this drop could be attributed to students not reading the questions carefully or answering questions at random in order to complete the quiz. It is also possible that there was confusion about how the question was worded or presented. We may try revising the way this concept is presented both in class and in the quiz to see if that helps achieve more consistency in the quiz results.

Based on the assessment results for this semester so far, there are broader implications for library instruction program beyond the individual information literacy skill level. This semester, in order to ensure consistency from class to class and librarian to librarian and assess student learning more meaningfully, a number of changes to the format, structure, and content covered in the FYS library instruction session were adopted. These quiz results are the first measure we have after these changes were adopted and implemented. It is useful and helpful to see an increase in correct answers almost universally in post-test quizzes. While there are a number of variables that can influence student quiz results, it is not unreasonable interpret these results as suggestive of successful student learning and effective information literacy instruction.



Question	PRE	POST
1a	92.7	95.423
1b	96.892	97.331
1c	80.133	85.215
1d	94.617	91.123
1e	97.683	96.385
1f	57.642	64.762
1g	84.725	86.862
1h	65.608	79.108
1i	90.767	93.731
2a	78.5	87.3
2b	76.825	89.508
2c	87.833	88.962
2d	92.383	94.338
2e	74.783	89.292
2f	80.508	83.769
2g	87.608	87.123
2h	74.733	80.815
3	46.2	56.885
4	40.433	70.831
5	76.058	85.154
6	79.042	82.746
7	49.842	57.662
8	73.9	83.454
9	70.875	74.9
10	73.433	74.277

(4) Critical Thinking Assessment Group

The General Education goal of critical thinking has the following student learning outcomes:

- A. Evaluate the quality of arguments and evidence and the accuracy of claims.
- B. Evaluate the quality of statistical evidence.
- C. Identify logical errors and fallacies.
- D. Distinguish among facts, inferences, opinions, and value assertions.
- E. Recognize alternative approaches and conflicting viewpoints.

Two sources of assessment data were collected. First, individual faculty teaching General Education-approved courses in critical thinking were contacted and asked to provide assessment data they had collected. Second, a standardized test of critical thinking, The Watson-Glaser Critical Thinking Appraisal Test, was administered to a sample of students in selected General Education-approved courses in critical thinking.

I. Assessment Data from Individual Disciplines

Faculty teaching General Education-approved courses in critical thinking in the following disciplines were contacted: Astronomy, Biology, Chemistry, Computer Sciences, English, Geology, History, Honors Seminar, Nursing, Physics, Plant Sciences, Political Sciences, Psychology, and Speech. The following data were submitted:

(A) Speech S228- Argumentation and Debate

Students in this course must complete in-class exercises, tests, papers, and debates designed to develop and assess critical thinking skills. Faculty provided ratings ranging from Excellent to Poor in each area assessed.

Tests

Question	Excellent	Good	Average	Fair	Poor
Identify models of reasoning	28%	17%	33%	22%	0%
Identify logical fallacies	55%	33%	12%	0%	0%
Analyze evidence	35%	47%	18%	0%	0%
Create an argument using Toulmin's model	38%	50%	12%	0%	0%

Papers

Assignment	Excellent	Good	Average	Fair	Poor
Ethics assignment	30%	35%	27%	5%	3%
Logic assignment	8%	41%	30%	14%	7%

Debates

Assignment	Excellent	Good	Average	Fair	Poor
Affirmative case	18%	82%	0%	0%	0%
Debate: overall scores	14%	76%	10%	0%	0%

(B) Biology L102 – Introduction to Biological Sciences II

Faculty within this discipline rated students on a scale of 1 to 3 based on whether the professor believed the student had fully (equivalent to a grade of 91-100%) achieved the goal (1), had partially (equivalent to a grade of 51-90%) achieved the goal (2), or had minimally (equivalent to a grade of 0-50%) achieved the goal (3).

Criteria	Individual Classes:			Overall N=53	
	L102 Fall, 05 N=20	L102 Summer, 06 N= 13	L102 Fall, 06 N=20		
Evaluate the quality of arguments and evidence, and the accuracy of claims.	Full	85%	77%	75%	79.3%
	Partial	15%	15%	15%	15.0%
	Minimal	0%	8%	10%	5.7%
Evaluate the quality of statistical evidence.	Full	-----	85%	90%	88.0%
	Partial	-----	15%	10%	12.0%
	Minimal	-----	0%	0%	0.0%
Identify logical errors and fallacies.	Full	65%	85%	67%	70.7%
	Partial	30%	15%	33%	27.5%
	Minimal	5%	0%	0%	1.9%
Distinguish among facts, inferences, opinions, and value assertions.	Full	90%	77%	70%	79.3%
	Partial	10%	15%	20%	15.0%
	Minimal	0%	8%	10%	5.7%
Recognize alternative approaches and conflicting viewpoints.	Full	100%	77%	67%	81.9%
	Partial	0%	15%	27%	13.9%
	Minimal	0%	8%	7%	4.6%

(C) Political Science Y103 – Introduction to American Politics

Faculty within this discipline created Critical Thinking exercises and grading rubrics for Y103, Introduction to American Politics. Students read articles about current political issues and address questions that required them to identify the main argument, cite supporting evidence, identify biases and faulty reasoning, evaluate the conclusion, and to suggest an alternative way to the author’s point of view. A faculty-developed rubric was used to evaluate the answers. Results reported below are based on a 10% sample of students from the first (pre-test) and last (post-test) assignments for each semester.

Semester	N	Pre-test Average Score*	N	Post-test Average Score*
Spring, 2006	26	12.29	29	14.32
Fall, 2006	30	10.15	27	10.4
Spring, 2007	29	12.6	25	13.7

* Highest possible score was 20

Summary of Assessment Data from Individual Disciplines

Few data were submitted by disciplines. Of the data submitted, several problems prevented any in-depth analysis. Only one discipline, Political Science, provided pre-tests and post-tests. Such data is important to determine if students' critical thinking skills have increased. Second, the variety of methods used to assess critical thinking skills across disciplines make any combination of results problematic.

II. Assessment Data from Standardized Test

In the fall of 2007, a Critical Thinking Assessment Group was created by the General Education Committee. It was composed of one member from the General Education Committee and two faculty members with experience in the assessment of critical thinking. After reviewing the above data submitted by the individual instructors teaching General Education-approved critical thinking courses, it was determined that a more general, standardized test of critical thinking was needed. Following a review of the literature, two possible tests of critical thinking were identified: the Watson-Glaser Critical Thinking Appraisal Test (WGCTA) and the California Critical Thinking Skills Test (CCTST).

Both tests offered the opportunity to provide a standardized measure of critical thinking. Since the committee already had access to the Watson-Glaser, this test was used. Four classes, from the list of General Education-approved critical thinking courses were selected: two section of Political Science Y103 – Introduction to American Politics and two sections of Psychology P101- Introduction to Psychology I. These courses were selected as the majority of entering students take these courses. It was decided to administer the WGCTA at the end of the fall, 2007 semester. Due to time limitations, it was not possible to administer the WGCTA at the beginning of the semester as well in order to have a pre-test and a post-test. The WGCTA is composed of five subtests of 16 questions for a total of 80 questions. We administered three subtests: inferences, recognition of assumptions, and evaluation of arguments. These three subtests meshed with the five General Education Critical Thinking outcomes specified for our campus. Results are provided below:

Course	Inferences Mean (possible score=16)	Assumptions Mean (possible score=16)	Arguments Mean (possible score=16)	Overall Mean (possible score=48)
Y103 N=26	8.62	10.08	11.58	29.88
Y103 N=22	8.18	10.86	12.09	31.14
P101 N=19	6.89	9.21	11.19	28.00
P101 N=29	8.10	10.79	12.48	31.38
Total N=96	8.02	10.30	12.03	30.25

Summary of Assessment Data from Standardized Test

The present results on the Watson-Glaser Critical Thinking Appraisal Test are useful in several respects. First, accomplishing the administration of the test was fairly easy. Using such an approach in the future would be possible without unduly disrupting the regular classroom activities. Second, although we were not able to administer a pre-test and a post-test, the present results clearly suggest that students were more successful in developing skills in the evaluation of arguments,

followed by recognition of arguments, and had significant difficulty with inferences. These results would be of value to faculty teaching these courses and the results will be shared with faculty teaching the General Education-approved critical thinking courses over the next several months.

The administration of a standardized test to a sample of students is advantageous to the assessment of critical thinking at the course level. Such an approach might reduce the number of assessment based tests students must complete, may reduce faculty workload, and may lead to more interpretable results. Several recommendations seem warranted based on this initial assessment:

1. Assessment of General Education Critical Thinking outcomes is clearly of pedagogical value to all instructors teaching one of these courses and should be encouraged at the discipline level. However, assessing General Education Critical Thinking outcomes would be best at the campus level for purposes of General Education overall goals.
2. The use of a standardized critical thinking test would be advantageous. It is the recommendation of this committee that consideration be given to adopting Form 2000 of the California Test of Critical Thinking Skills. This test has been updated for use with college students and has been successfully used on other campuses.
3. The development of critical thinking skills requires time. Expecting to see significant change across a single course may be somewhat unrealistic. In order to best document the development of critical thinking skills, this committee recommends selecting a sample of 100 entering students to complete Form 2000 of the California Test of Critical Thinking Skills as a pre-test. For comparison, a sample of senior students enrolled in their capstone course could be asked to complete Form 2000 of the California Test of Critical Thinking Skills as a post-test. This would allow for the best demonstration of whether students are developing these important skills. In year 1, this could be completed as a cross-sectional study and, over time, developed into a longitudinal study.