Why Critical Thinking Should Be Combined With Written Composition

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Abstract: This paper provides evidence and arguments that, given the choice of teaching critical thinking and written composition as separate, stand-alone courses or combining them, the two should be combined into an integrated sequence.

Résumé: Cet article fournit l'évidence et les arguments qui montrent que, étant donné qu'on a le choix d'enseigner la pensée critique et la composition écrite comme des cours séparés, autonomes ou bien en combinaison, on devrait les rassembler dans un ordre intégré.

Keywords: assessing critical thinking skills, combining critical thinking and composition, critical thinking, critical thinking assessment, critical thinking tests, critical thinking and composition, critical thinking and writing, written composition, written composition assessment

Introduction

It is not often that those who teach critical thinking assess the outcomes of their courses using relatively long-term comparison studies. This is unfortunate because, by critical thinking standards, claims are often made about its virtues that are not adequately supported with anything but anecdotal evidence or our intuitions as teachers. Fortunately, because of two federal grants which demanded outcomes assessment, and long-term funding for program development and assessment by the Hall Family Foundation, faculty at Baker University were able to design a critical thinking/composition sequence required of all freshmen and assess, at least as much as is possible given how hard it is to control variables in an educational setting, the program's effectiveness relative to alternative approaches. After seven years, the results, albeit tentative, suggest that courses that integrate instruction in critical thinking and written composition are more effective than the standard stand-alone course in either critical thinking or composition. In fact—and this is disturbing—the results suggest that stand-alone critical thinking or composition courses have little effect on student performance in either critical thinking or written composition, but that two-semester integrated courses have much more positive outcomes with respect to both critical thinking and composition skills.

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History

Since 1979, Baker University has had a capstone seminar, "Science, Technology, and Human Values," required of all graduating seniors. Seniors choose a public policy issue brought about by scientific or technological developments, research the issue, and then prepare a position paper that argues, in light of the alternatives, for a specific public policy. While the research and writing skills were adequate, many seniors were not good at supporting their positions with strong arguments or critiquing the reasonableness of alternative positions. Critical evaluation and sustained argumentation seemed to be areas lacking in their education.

To address this weakness, in 1988 we applied for and received grant funding from the U.S. Department of Education. Selected faculty from the humanities were given released time to create a required course in critical thinking, with an emphasis on reading primary texts and writing well-argued papers. In the process of planning the course, Harvey Siegel, a consultant chosen for his expertise in the theoretical foundations of critical thinking,[1] suggested that we combine the critical thinking course with our existing required course in written composition. In effect, rather than having two stand-alone, required courses—one in critical thinking and another in written composition—we opted for a two-semester sequence that integrated both reasoning and writing.

As one might expect, this decision was met with a good deal of skepticism. Faculty trained in philosophy were sure the course would be too light in logic and critical thinking instruction; those trained in composition were worried that the new course would lack adequate instruction in writing. Michael Scriven has also made similar suggestions in his article "Prostitution of the Critical Thinking Requirement,"[2] claiming the hybrid courses that satisfy California's critical thinking requirement accomplish little. Given such concerns over the merit of our "new hybrid course," assessment became especially important. For the course to be accepted by faculty at our institution and in broader circles of academe, the doubts of its critics had to be met.[3] We had to set up an assessment program to see if our integrated approach performed as well as the standard one-semester courses.

In 1990, after two years of planning (and an additional FIPSE Grant), we began the required two-semester freshmen sequence.[4] One assumption underlying the project was that students could be better readers and writers if they were first taught how to think critically about what they read and write. We also believed students could use their knowledge of formal logic to construct arguments for the theses of their papers. After seven years, our research indicates that, given the choice of required stand-alone composition and a required critical thinking courses or a two-course sequence integrating critical thinking and composition, the latter is clearly preferable. It is disturbing to find that our research indicates that stand-alone, one-semester courses in composition or critical thinking have little effect on students' writing or critical thinking abilities.

Outline of the Courses:

What are these two-semester courses like? The courses begin, not unlike other critical thinking courses, by explaining the nature and importance of critical thinking. The text, which was developed by faculty involved in the project, gives a number of arguments, both practical and theoretical, for the value of critical thinking instruction.[5] For example, we show how many social problems, such as those resulting from prejudice against women and minorities, are the result of beliefs based on insufficient evidence and hasty generalizations. In addition, many personal problems, especially among the young, stem from a person's poor judgment or not honestly evaluating the available alternatives before making a decision.

We try to convince students that becoming critical thinkers is in their interest. After showing the importance of what we are asking students to learn, we follow with instruction in how to read difficult prose and how to identify arguments found there. Because students come to college with weak reading skills, learning to read carefully, with an eye to the evidence and arguments for any claim, is an essential skill. To address this, we spend a good deal of time teaching students how to paraphrase what they read and give them strategies for identifying arguments' conclusions and premises. An argument not identified or misunderstood can hardly be evaluated fairly.

Once arguments are identified, the next step is instruction in argument evaluation. We spend only three to four weeks—an unusually brief time compared with other critical thinking courses—studying deduction, induction, and a few of the more common informal fallacies. While there are other criteria for evaluating arguments, we decided to focus on these because of their simplicity, transferability among other disciplines, and use in constructing arguments. Most students have little trouble with this. Faculty not trained in philosophy, however, sometimes struggle with the material.

The final step in the process is to show how these logical tools are useful in writing argumentative papers. We teach students how to use some of the standard argument patterns (modus ponens, modus tollens, and disjunctive syllogism) to construct arguments in support of positions they might defend in a paper. For example, one way to argue for a position is to employ what we call a modus tollens strategy. Students begin by negating the position in question and then showing how denying the position leads to unacceptable consequences. For example, if we don't teach critical thinking, students will be easily duped by politicians. We do not want that in a democracy. Hence, we should teach critical thinking.

In the spirit of critical thinking defined as the honest evaluation of alternative positions, we ask students to construct the best arguments they can on both sides of an issue before deciding upon a thesis. Often, weak papers are the result of students picking a position, not because they have honestly evaluated the alternatives, but because it agrees with their deeply felt intuitions or gut feelings. Students

often fail to recognize the extent to which they have been socialized by their culture to think in certain ways about specific issues in spite of good reasons for alternative conclusions.[6]

After evaluating arguments for different sides of an issue, students create outlines for their position papers. Students and teachers then meet to discuss the outline. The focus of the conference is on the thesis and the strength of the arguments in its support. If the outline is acceptable, the student then begins writing. All papers follow the same four-part, pattern with an introduction, clarification, and thesis, supporting reasons and arguments, possible objections and replies, and then a conclusion.

The second semester of the course asks students to apply these same critical thinking skills and strategies to five sets of readings and write five additional critical papers, all following the same basic form. Where possible, we choose classic texts as our readings, making sure they take different positions with respect to an issue. For example, in considering the worth of a market economy, we often read selections from Adam Smith's The Wealth of Nations and Marx and Engel's Communist Manifesto. The students must then evaluate the alternatives and argue for the most reasonable position.

These courses differ from traditional critical thinking courses in so far as they focus on the use of critical thinking skills to support, as well as critique, positions. The time spent on writing, probably 70%, far exceeds the time spent on instruction in the logic necessary for critical thinking. They differ from traditional written composition courses in so far as they emphasize only one type of paper—the argumentative essay. In addition, all grammar is taught in the context of student writing. For example, upon returning a set of essays, a teacher might spend half a class period going over the points of grammar found wanting in the papers. Students must return their papers with all mechanical errors corrected prior to receiving a grade.

Assessment

How well does this integrated approach work compared to stand-alone courses in critical thinking and composition? Because assessing critical thinking and written composition (as well as all educational research) is difficult, our conclusions should be seen as tentative. We have strong evidence that our integrated approach gets good results, but there may be stand-alone, one-semester composition and critical thinking courses that get equally good outcomes. However, the ones that we used as comparison studies did not.

Given the nature of our project, with its focus on the relation between critical thinking and writing, Steve Norris, our consultant for assessment, and co-author with Bob Ennis of Evaluating Critical Thinking,[7] recommended that we evaluate the critical thinking component with the Ennis-Weir Critical Thinking Essay Test

(E-W). This test asks students to read a series of arguments put in the form of a letter to the editor and to respond in a letter evaluating each argument, telling whether it is good or bad and why. After numerous trial runs to see if graders of the test could attain high enough intergrader reliability for our research purposes, we decided to take Norris' advice and use the Ennis-Weir as our assessment instrument.[8] Unfortunately, we discovered that there were no other studies similar to ours to which to compare scores. Hence, we had to find teachers in other schools who were willing to give pre and post tests in their one-semester logic/ critical thinking classes in order to have comparison groups. To insure that students took the post-test seriously, the post-test was always given as part of students' final exams.

In the fall of 1996, we switched to the California Critical Thinking Skills Test because in validating the test, pre and post test scores for sections of one-semester critical thinking courses were available. We also hope to find other programs that have given pre and post tests with whom to compare outcomes.

How did we evaluate student progress in writing? While the staff could attain high intergrader reliability on the Ennis-Weir exam, this was not the case in evaluating student essays with a focus on overall quality of writing or composition skills. As a result, we choose an objective test, the Test of Standard Written English (TSWE), as our tool for assessing changes in student writing ability. According to the test booklet, the TSWE was validated by comparing student scores on the TSWE with their grades on essays. The correlation was suitably high. Hence, performance on the test should indicate the quality of the student's writing ability. The range of possible scores on the TSWE is 20 to 60, with 44 being the average for college-bound, high school seniors.

For seven years, the tests have been given to Baker students three times: the first week of class their freshman year, again at the end of the year as part of their final exam, and again during their senior year as part of their midterm for the senior seminar, "Science, Technology, and Human Values." Taking the exams as part of their midterm helped assure us that the seniors would take the exams seriously. Currently, we have full data on 1359 freshmen and 394 seniors who have gone through the program. In over eight years of the study, the average gain on the TSWE for freshmen completing the two-semester sequence was 4.5, with a standard deviation of +/-9.06 for the pre-test and +/-7.78 on the post-test, and statistical significance of .001. The average gain for Baker freshmen on the Ennis-Weir Critical Thinking Essay Test was 5.3, with a standard deviation of +/-5.3 on the pre-test and +/-5.7 on the post, and a statistical significance of .001.

If we assume that the TSWE and E-W are valid instruments of measurement, the data indicates that teaching critical thinking and composition in an integrated two-semester sequence produces better outcomes than teaching each separately. Hence, if the choice is to combine the two courses or leave them distinct, combining is the best alternative. The whole is indeed greater than the sum of the parts.

Evidence for this conclusion is provided in the following tables where we compare the pre and post test scores of Baker students who have completed the sequence to comparison groups who took traditional stand-alone critical thinking and composition courses.

The tables provide average pre and post test scores for Baker freshmen and seniors on the Test of Standard Written English (TSWE), the Ennis-Weir Critical Thinking Essay Test (E-W) from the fall of 1990 to spring of 1996, and the California Critical Thinking Skills Test for the 1996-98 academic year. Freshmen scores on the TSWE and the Ennis-Weir are compared to comparison groups from other colleges taking stand-alone, one-semester, elective courses in logic and required courses in composition.

COMPARISON of BAKER UNIVERSITY TSWE
PRE and POST TEST SCORES from FALL 1990 to SPRING 1996

FRESHMEN SEQUENCE	**Pre TSWE**	**Std. Dev.**	**Post TSWE**	**Std. Dev.**	**Diff**
90/91 (n=169)	45.3		49.0		3.7
91/92 (n=119)	46.0		51.1		5.1
92/93 (n=178)	44.8		48.8		4.0
93/94 (n=178)	47.1		48.7		1.6
94/95 (n=164)	43.1		49.3		6.2
95/96 (n=169)	42.8		48.0		5.2
96/97 (n=152)	43.3		49.1		5.8
97/98 (n=230)	40.7		47.1		6.4
Mean (n=1359) .001	**44.6**	**+/-9.06**	**49.1**	**+/-7.78**	**4.5**

Baker Freshmen to Senior Comparison:

	Fr.	**Sr.**	**Diff.**	**Sig.**
Grads 1995 (n=119)	44.7	49.6	4.9	
Grads 1996 (n=88)	45.8	51.0	5.3	
Grads 1997 (n=86)	46.0	50.0	4.0	
Grads 1998 (n=58)*	45.4	52.3	6.9	
Grads 1999 (n=43)*	43.8	50.2	6.4	
Mean (n=207)	**45.1**	**50.6**	**5.5**	**.001**

*The numbers for 1998 and 1999 are incomplete.

Comparison Groups:	**pre TSWE**	**post TSWE**	**Diff.**	**Sig.**
State University (three-semester requirement):				
EN 101 (F92 n=38)	44.9	46.2	+1.3	
EN 102 (S95 n=49)	42.4	42.5	+0.1	
En 210 (F95 n=105)		45.2	+0.3 (after three-semesters)	
Liberal Arts College (one-semester requirement):				
EN 101 (F91 n=19)	42.2	45.6	+3.4	
Mean	**43.2**	**44.8**	**+1.6**	**not significant**

With respect to scores on the Test of Standard Written English (TSWE), we should notice that for the eight years of the project, the average improvement on the TSWE for Baker freshmen was 4.5 points, with a range of +1.6 to +6.4. For comparison groups, the average improvement was +1.6, with a range of +0.1 to +3.4.[9] If we assume the validity of the TSWE, can any conclusions about the effect of Baker's two-semester critical thinking/composition sequence on students' writing ability be drawn? Over the eight years, Baker students' average gain of 4.5 was not only statistically significant, but far exceeded the gains of students satisfying a three-semester composition requirement, one that did not emphasize critical thinking. Ironically, some quite counter-intuitive hypotheses can be supported by these results.

First, one could postulate that it was the critical thinking component in our sequence that made the difference in student writing. That is, rather than distracting students' attention from the mechanical and stylistic details needed by accomplished writers, instruction in logic and critical thinking may well enhance an attentive, self-critical attitude so useful for being a good writer.

Second, one might also conclude that our pedagogical approach for teaching grammar was more effective than more traditional approaches. For example, rather than teaching grammar out of a workbook with stand-alone exercises, we simply make students correct all mechanical errors in the six papers they write prior to having the grades recorded. If they do not understand the error, instructors direct them to the proper section of a suitable grammar handbook. Ironically, during the 93/94 academic year, we gave students grammar exercises apart from their writing projects. At the end of that year, the TSWE gain was only 1.6, far below that of any other year. What seems to follow is the counter-intuitive claim

that instruction in grammar is, not only not an effective way to improve student writing, but is counter-productive. Such instruction may actually harm students.

Another possible conclusion of the study is that time in the classroom, three semesters as opposed to two, does not seem to enhance students' TSWE scores. It appears that two semesters of focused instruction in writing well-argued expository prose is better than three semesters where, one assumes, a variety of forms of papers were taught.

Finally, if we assume that students are doing more writing in a three-semester composition requirement than in a two-semester course where at least one-fourth of the time is spent learning logic and critical thinking, then the amount of writing does not seem to effect test scores. The old adage that students become better writers by writing is only partially true. More may depend on the kind of writing they are asked to do, and how well they understand and internalize the process. Variation may simply create confusion.

So, while on the face of it, a sequence that combined critical thinking with written composition might be seen as "not a real composition course," not providing adequate instruction in writing, our data supports the opposite conclusion. But what about logic and critical thinking? Surely all of the time spent on writing papers will detract from students' ability to improve their critical thinking skills.

Using the Ennis-Weir Critical Thinking Essay Test as our assessment tool, the following data chart provides a summary of pre- and post-test scores for students in the Baker program for the first six years of the program. These scores are compared with scores for students who took more traditional, one-semester logic or critical thinking courses. The range for possible scores for the Ennis-Weir Critical Thinking Essay Test is -9 to +29. The test booklet for the Ennis-Weir does not establish an average score for college freshmen.

COMPARISON of ENNIS-WEIR CRITICAL THINKING ESSAY TEST PRE and POST-TEST SCORES for BAKER UNIVERSITY

FALL 1990 to SPRING 1996

BAKER FRESHMEN	**Pre E-W**	**St.D**	**Post E-W**	**St.D.**	**Diff.**	**Sig.**
90/91 (n=169)	6.3		12.4		6.1	
91/92 (n=119)	9.4		12.2		2.8	
92/93 (n=178)	6.8		12.6		5.8	
93/94 (n=178)	8.1		14.1		6.0	
94/95 (n=164)	7.5		13.0		5.5	
95/96 (n=169)	6.9		12.9		6.0	
Mean (n=977)	**7.5**	**+/- 5.3**	**12.8**	**+/-5.3**	**5.3**	**.001**

Baker Freshmen to Senior Comparison:

	Fr.	Sr.	Diff.	Sig.
Grads 1995 (n=119)	9.4	14.6	5.2	
Grads 1996 (n=88)	7.1	14.1	7.0	
Grads 1997 (n=80	6.8	14.8	8.0	
Grads 1998 (n=58)*	8.8	19.1	10.3	
Grads 1999 (n=42)*	7.3	17.4	10.1	
Mean (n=387)	**7.9**	**16.0**	**8.1**	**.001**

*Data is incomplete on these classes.

Comparison Groups:				
Standard Logic (F94 n=44)	11.2	9.5	-1.7	
Standard Critical Thinking (S92 n=23)	12.1	13.7	+1.6	
Mean (n=67)	**11.7**	**11.6**	**-0.10**	**not significant**

Because of the time needed to grade the Ennis-Weir essay exam and not finding other schools using it as an assessment tool, in the fall of 1996 we switched to the California Critical Thinking Skills Test to assess critical thinking outcomes. The range of possible scores is 0 to 34. In validating the test, its author reports that 261 students enrolled in critical thinking courses took both pre and post tests. The pre-test mean was 15.3898 with a standard deviation of 4.501. The post-test mean was 17.389 with a standard deviation of 4.589. The difference was +2.00.[10] Our positive results on this test add validation to the Ennis-Weir results and again indicate that the integrated sequence is superior to some stand alone one-semester approaches.

PRE AND POST TEST SCORES USING THE CALIFORNIA CRITICAL THINKING SKILLS TEST, FALL '96 to SPRING' 97

Baker Freshmen	**Pre**	**St.D.**	**Post**	**St.D.**	**Diff.**	**T**	**Sig.**
F96/S97 (n=152)	14.9		18.3		+3.4		
F97/S98 (n=228)	14.3		17.2		+2.9		
Mean (n=380)	14.6	+/-4.0	17.6	+/-3.7	+3.0	8.0	<.001
Comparison Group							
Test Validation Study (n=261)	15.4	+/-4.6	17.4	+/-4.7	+2.0	2.4	<.0075

What can we conclude from the data using the Ennis-Weir and the California Critical Thinking Skills Test scores? Over the six years of using the Ennis-Weir, Baker freshmen who completed the critical thinking and composition sequence had an average increase of 5.3 points.[11] A statistical analysis of variance yields a standard deviation of +/-5.3 and =/-5.7, a statistical significance of .001. Intergrader reliability, always a concern for the Ennis-Weir exam, ranged from .85 to .95 over the six years. That means that scoring the Ennis-Weir essay objectively is indeed possible.

The Ennis-Weir scores of the comparison groups who took traditional one-semester logic or critical thinking courses decreased an average of .10. One comparison group was comprised of two sections of a standard, one-semester logic course using popular textbooks. Because the course was an elective, attracting those students with an interest in logic, the students scored well on the pre-test (11.2). Strangely, the average scores declined on the post-test (9.5). The critical thinking course was also an elective and used a standard critical thinking text, with no attempt to integrate critical thinking with composition skills. The gain of 1.6 points was modest, but well below the average gain of +5.3 for Baker students who go through the two-semester sequence.

Additional encouraging data is the comparison of the average E-W post-test scores for current graduating seniors (16.0) to the scores of a group of seniors (n=53) who took the test prior to 1990 when we began the new critical thinking/composition sequence (11.4). The difference seems to indicate the effect of the new critical thinking/composition sequence on student critical thinking skills, although there could be other variables. For example, the seniors who took the test prior to 1990 did not take it as part of a mid-term or final, as current seniors do. In order to assure high inter-grader reliability with respect to the pre-1992 and present Ennis-Weir tests, we had the graders who grade the current essays go back and grade the old tests of the seniors who took the test between 1988 and 1992 who had not had the critical thinking/composition sequence.[12]

Conclusion

Assuming the validity of the Ennis-Weir Critical Thinking Essay Test and the California Critical Thinking Skills Test, what could explain the success of the integrated, two-semester sequence over the more traditional approaches of teaching logic and critical thinking? One possible answer is the simplicity, focus, and repeated application of critical thinking skills in the two-semester sequence. Almost everything covered in the sequence focuses on developing skills to evaluate positions found in what students read and write. Such focus and repetition may make it easier to internalize the critical thinking skills. Beyond that, it is possible that traditional logic courses confuse students by trying to cover too much material. In the two-semester sequence, we devote only the first six weeks to the study of the critical tools necessary for argument evaluation and construction. Instruction

in formal and informal logic is kept to a minimum. (We don't even do truth-tables.) Whatever students are taught is applied over and over to what they read and in writing their papers. Critical thinking is seen as something that has obvious use. It is not just a set of skills and dispositions needed to pass a test and then be forgotten.

What else may account for the success of our students, relative to the comparison groups? Educational research is notoriously uncertain. Compelling answers would take more controlled experiments where we carefully isolate as many variables as possible, e.g., teaching methods, textbooks, and teacher preparation. Nonetheless, there are some obvious differences with respect to our freshmen sequence which appear to be causally related to the difference in performance between our students and the comparison groups.

First, by decree of the non-philosophers who worked to design the freshmen sequence, the critical thinking instruction had to be relatively simple—nothing fancy or too complex. While most students can pick up a little formal logic pretty easily, some faculty, having never had a course in logic, find the notion of valid inferences in formal logic confusing. So, in order to attract as many qualified faculty as possible to teach the course, we minimized instruction in logic. In the finished text, we focused on a few fundamental concepts and strategies essential for thinking critically and showed how they could be applied to everything students were asked to read and write. The simplicity of our approach may have been a happy accident. If someone desires a Ph.D in philosophy, "a little learning may be a dangerous thing," but it may be just what the doctor ordered when it comes to critical thinking instruction at the undergraduate level. Or as the saying goes, "Keep it simple stupid."

Second, time is also an obvious difference between our approach and the comparison groups. A two-semester sequence, where relatively simple ideas are repeated often, appears to yield far better outcomes than the traditional one-semester non-integrated courses in critical thinking or composition. Applying the same concepts and strategies, albeit to different subjects, for 30 weeks results in better educational outcomes than one-semester courses. This evidence, more than anything else, argues for the value of adopting a critical thinking across the curriculum approach, where all instructors ask students to evaluate positions by the standards of evidence and argument proper to their discipline. Our study also supports the importance of all faculty demanding that students write well, regardless of the discipline. If the same song is sung often enough, then students tend to learn it. When different teachers play the game by different rules, then students have a hard time deciding what is important and what is peripheral, let alone how to evaluate the rationality of a position. Third, our students may have taken critical thinking more seriously than those in the comparison groups because we spend a good deal of time showing them how it applies (or can apply) to everything they read and write. Most logic courses do not do this. Logic is perceived as one

course among many—and indeed given our test results—it many well be just that.

One negative conclusion of our study is that students do not get much better at either the TSWE or the Ennis-Weir exam after their freshmen year. Of the 394 seniors for whom we currently have complete data, their 5.5 point gain on the TSWE over the four years of undergraduate study is only one point better than the average student gain at the end of the freshmen sequence (4.5). The average freshmen to senior gain on the Ennis-Weir was 8.1 points, again only 2.8 points better than the 5.3 average gain over the freshmen year. The cause of such meager freshmen to senior gains is probably because too many students are able to navigate the waters of undergraduate education steering clear of courses that require much thinking and expository writing.[13] As long as this situation continues, senior gains will surely remain small.

In response to this problem, Baker faculty have required four writing courses in which students must write papers of at least eight typed pages in length. This writing is to be graded with a careful eye to grammar, mechanics, clarity, style, and reasoning. With continued testing, we will be able to see if there are any differences.

In conclusion, if our research is indicative of student outcomes, it appears that one-semester courses in either critical thinking or written composition make very little difference in students' abilities to think critically or understand the fundamentals of good English prose. On the other hand, a two-semester sequence that integrates critical thinking instruction with written composition can have significant effects on student performance. Hopefully, other educators interested in enhancing student writing and thinking skills can learn from our example and share their assessment data with the educational community.

Endnotes

[1]We began planning our course by reading Siegel's fine book *Educating Reason: Rationality, Critical Thinking, and Education* (New York: Routledge, 1988). Because most of the faculty involved in the program were not familiar with the literature surrounding the critical thinking movement, I thought that Siegel's book would set the parameters for what would count as critical thinking and what would not, and so save us a good deal of time.

[2]Michael Scriven, "Prostitution of the Critical Thinking Requirement," *CT News*, Vol. 10, #2, 1992, pp.1-5.

[3]There will of course always be those who remain skeptical because of the difficulty of doing educational research. It is extremely hard to account for and control all of the variables. Hence, one's conclusions must be taken tentatively. Nonetheless, if claims about the merits of teaching critical thinking are to be taken seriously, those willing to do the research must forge (stumble?) ahead. The alternative, I fear, is, in this age where educators focus more and more on educational outcomes, critical thinking will not be taken seriously. It will soon no longer be the "educational ideal" for which Siegel argues so eloquently.

[4]Since 1991, partial funding for the courses and the continued research has been provided by two grants from the Hall Family Foundation.The people of the foundation were quite interested in

our attempt to revamp the way writing is taught by integrating instruction in critical thinking with composition.

[5]Donald L. Hatcher and L. Anne Spencer, *Reasoning and Writing* (Lanham, MD: Rowman and Littlefield, 1993).

[6]We always begin the course by reading Plato's "Allegory of the Cave" in an attempt to get students to recognize how many of their ideas are a function of values projected on the wall of their specific "caves" when they were young. But it is hard in a couple of classes to free students from the effects of living many in a specific culture with its values and ideas.

[7]Stephen P. Norris and Robert H. Ennis, *Evaluating Critical Thinking* (Pacific Grove, CA: Midwest Publications, 1989).

[8]While we are so far pleased with the results, anyone considering using the Ennis-Weir should understand that grading the test is much more time consuming than grading a multiple choice exam. On the other hand, according to Norris and Ennis, the test's format is as close to "a typical real-life situation in which critical thinking is needed" as anything on the market. Out intergrader reliability has always been over .86, and often over .93, so accuracy of the scores is not as much of a problem as some might think.

[9]This average would have been somewhat higher if it had not been for the small gains of 1.6 points in the 93/94 academic year. During this year we decided to try giving "stand alone lessons" in English grammar throughout the two semesters. The effect seems to be that grammar taught apart from an actual writing assignment merely confuses students.

[10]Peter A. Facione, "The California Critical Thinking Skills Test—College Level: Technical Report #1. Experimental Validation and Content Validation." (1990) *ERIC* Doc. No: TM 015818, pp. 15-16.

[11]This score would have been somewhat higher if it had not been for the 91/92 scores. This was a bad year for the program because we were still in the process of refining our text, *Reasoning and Writing*, and some of the staff were still having problems with the logic involved in teaching critical thinking.

[12]Fortunately, the longer people teach in the program, the better we all get at explaining, exemplifying, and applying the critical thinking procedures in the text. The initial graders arrived at an average of 11.3 for the 53 exams. This indicates that even different grading teams can attain similar scores for the Ennis-Weir Critical Thinking Essay exam.

[13]For example, there are humanities courses that count for general education requirements where the instructor does not require papers and gives true/false tests.

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