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ABSTRACT

This paper presents the preliminary results of a longitudinal study to assess the development of critical thinking as preservice teachers progress through their educational program. Students will be assessed during their final year in the program to help give an overview of the growth of their critical thinking skills. The Cornell Critical Thinking Test (Level Z) was administered to students in elementary (n=44), secondary (n=20), political science (n=24), psychology (n=19), and a combined group of early childhood, bilingual, and special education students (n=11). Those enrolled in the student teacher program will be assessed again to evaluate their growth in thinking skills. The means and standard deviations for the groups are presented in tables, with means similar across the groups. Study results indicated that few teachers, programs, and institutions actively integrate, assess, teach, and evaluate critical thinking across the curriculum. Further, while teachers are expected to teach critical thinking skills, teachers are rarely taught specifically how to teach these skills. (ND)

Paper presented at the National Social Science Association Meeting, Las Vegas, NV, April 1997

# Critical Thinking Skills: Levels of Preservice Elementary, Secondary, and Special Education Students

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## Abstract

The preparation of teachers is of critical concern as we approach the year 2000. This paper addresses the need to examine critical thinking as an aspect of reflective thinking. The results of a critical thinking assessment are reported and the implications reviewed.

Critical Thinking Skills: Levels of Preservice

Elementary, Secondary, and Special Education Students

Critical thinking, while often discussed, is rarely defined and more infrequently, specifically taught. Part of this is due to lack of definition, and part is due to time constraints. In the preparation of pre-service teachers, classroom management, mainstreaming, assessment, and pedagogy are extensively reviewed. However, while reflective thinking is emphasized, critical thinking is less often enunciated.

While critical thinking is viewed as important, few reports discuss the results of attempts to infuse critical thinking into the curriculum. Ocansey (1992) has discussed the promotion of critical thinking in student teaching. Ring (1993) has examined changes in critical thinking skills during the student teaching experience. Sesow (1991) worked to improve the critical thinking ability of pre-service social studies teachers. Arnold (1992) has described the strengthening of critical thinking skills through collaborative research.

Philosophically, student teacher program should have a mission statement that may or may not include the teaching of critical thinking. Many teacher education programs focus on reflective thinking.

This includes self-evaluation, review of teaching methodology, and progress review. Some programs employ a journal or portfolio procedure to enhance or accomplish this goal.

Collaborative writing is often used in some programs to promote critical thinking. This serves three purposes: 1.) To enhance higher order evaluative thinking; 2.) To improve writing skills; and 3.) To enhance awareness of contemporary educational issues.

Direct assessment of critical thinking skills has not, as yet, been examined as an important part of the student teaching experience. For evaluation purposes, it may be helpful to assess critical thinking sills early in the student teaching experience to enhance awareness of this domain.

Teacher education programs should, during evaluation periods, examine the need for, and importance of, critical thinking of their program and courses. Generalization to the student teacher's major area of study, e.g., math, history, science, is of importance and should be addressed. Modeling on the part of university supervisors and collaborating teachers is crucial, but perhaps of more importance is a clear definition of critical thinking and a method of evaluation. Lesson planning should incorporate Bloom's Taxonomy of educational objectives, at least at a minimal level. Bloom's taxonomy is at least one effort to emphasize higher order critical

thinking skills. Elementary, middle school, and secondary educators may need to develop their own model of critical thinking for differential subject areas.

Part of the problem facing Political Science professors interested in fostering and facilitating critical thinking skills is located in the definition of critical thinking itself. Some see critical thinking to be more along the lines of logical reasoning; while others stress logic with empirical requirements. The latter seek to collect data, organize them, and then analyze the data to build a picture and contribute to the accumulation of knowledge. All too often, this approach is being downplayed in late twentieth century American education. The post-modern tidal wave has moved us away from collecting data towards a stress on how one feels about something. While this approach has some merit, it should not be the reigning paradigm of political science education. We will, no doubt, continue to differ over the type of critical thinking that is best for students' academic development.

This paper presents the preliminary results of a longitudinal study to assess the development of critical thinking as pre-service teachers progress though their educational program. Students will be assessed

during their final year in the program to help give an overview of the growth of their critical thinking skills.

In the Fall of 1996, the Cornell Critical Thinking Test (Level Z) was administered to students in elementary, secondary, and other disciplines (Political Science and Psychology) for comparative purposes. Those enrolled in the student teacher program will be later assessed to evaluate growth of their thinking skills.

The Cornell Critical Thinking Test (Level Z) was chosen for the following reasons. First, it was easy to administer. Second, the time required to take the test was minimal, approximately one hour including preliminary time. Third, the test had an objective computerized scoring. Other options such as the Ross Test of Higher Order Thinking Processes and the Watson-Glaser Critical Thinking Appraisal were considered. For a review of the most common tests of critical thinking, see Ennis (1993). Some of the other tests were thought to be more reflective of logic, rather than critical thinking.

## RESULTS

The means and standard deviations for the various groups are indicated in the table below. For simplicity, some small groups (e.g. Early Childhood Education, Bilingual Education. and Special Education) were integrated into a collapsed group for ANOVA procedures.

| POLITICAL SCIENCE | PSYCHOLOGY | ELEMENTARY ED. |
|---|---|---|
| X = 27.6 | 27.4 | 26.2 |
| SD = 5.9 | 4.3 | 4.7 |
| N = 24 | 19 | 44 |
| SECONDARY ED. | COLLAPSED GROUP (BLED,SPED, etc.) | |
| X = 25.7 | 24.7 | |
| SD = 6.7 | 3.9 | |
| N = 20 | 11 | |

The ANOVA procedure resulted in an F value of 1.30, which was not significant. Unequal sample sizes were one problem in the study as well as the small numbers of students in certain disciplines ( Early Childhood, Bilingual, and Special Education).

Means were similar, as can be discerned from the above table. It may be necessary in future research to examine the reading rate and comprehension skills of college students. In addition, many of the subjects in this experiment were non-traditional students and this factor should be examined in future research.

## SUMMARY AND INCLUSION

Critical thinking is somewhat like the weather. Everyone talks about critical thinking, but few teachers, programs and institutions actively integrate, assess, teach, and evaluate critical thinking across the curriculum. Further, while we expect teachers to teach critical thinking skills; we rarely, specifically teach teachers how to teach critical thinking skills. We do not teach teachers how to evaluate critical thinking, much less, how to instill critical thinking attitudes in their students. In addition, in an age of mainstreaming and full inclusion, many teachers and teaching institutions may question the need for critical thinking when a teacher is confronted with a classroom of learning disabled, emotionally disturbed, and hyperactive students.

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