Teaching Critical Thinking Through Student Self Analysis of Video Taped Seminar Discussions

James M. Miller
TEACHING CRITICAL THINKING THROUGH STUDENT 
SELF ANALYSIS OF VIDEO TAPELED 
SEMINAR DISCUSSIONS 

by 

James M. Miller 

A dissertation submitted in partial fulfillment 
of the requirements for the degree 
of 
DOCTOR OF EDUCATION 
in 
Educational Administration 

Approved: 

UTAH STATE UNIVERSITY 
Logan, Utah 

1973
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James Matheson Miller

1973
ACKNOWLEDGEMENTS

This experimental study covered a three year period of time and involved a number of individuals for whose assistance I am most grateful.

I would like to express my deep appreciation to my wife, Jackie, who typed this dissertation, and gave constant support and encouragement. I also wish to express my appreciation to my children, Bonnie Kay, Robert, and Teresa Lyn for their understanding and cooperation during the years the study took place.

A special appreciation is extended to Dr. J. Clair Morris and the Board of Education of the Iron County School District who permitted the study to take place and who cooperated in solving the staffing problems caused by my absence from C.H.S. during the residency phase of my Ed. D. program. I am also very grateful to Mr. Bruce Decker and Mr. John Pensis who took over the administrative responsibilities at C.H.S. during my absence.

A sincere "thank you" is extended to Mr. Rulan Woodbury and the staff at C.H.S. To Mr. Kent Bishop and Mr. Richard Anderson a special "thanks" for the support and cooperation they gave by allowing their classrooms and students to be used for the study. Appreciation is also expressed to Mr. Fred Whicker, I.M.C. Coordinator at C.H.S., whose technical assistance was indispensable in preparing the demonstration video tape and in recording student discussions on audio and video tapes.
I am deeply indebted to the members of my advisory committee for their assistance with the study. To Dr. Terrance Hatch and Dr. Jim Jacobson, a special thanks. Their assistance over a five year period which included both an M.S. and an Ed.D. program is appreciated. Dr. Bob Wininger, and Dr. Dick Knight who helped with the final stages of the study, also made a contribution which was most helpful. Dr. "Charlie" Ryan, who assisted with the developmental phase of the study, also made a contribution which is appreciated. I would also like to express my appreciation for the consideration shown to me by Dr. Basil Hansen whose untimely death cut short the time he assisted with the study. This brief quote perhaps best expressed my gratitude for Dr. Jim Shaver who was my committee chairman during both my Masters and Doctoral programs.

... men walk almost always in the paths trodden by others, proceeding in their actions by imitation, not always able to follow others exactly, nor attain to the excellence of those he imitates, a prudent man should always follow in the path trodden by great men and imitate those who are most excellent, so that if he does not attain to their greatness, at any rate he will get some tinge of it. (Machiavelli--The Prince)

Whatever degree of success that was attained in researching and reporting the findings of the study, was due to the concern and assistance given by Dr. Shaver, to whom I am most appreciative.

James M. Miller
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ABSTRACT

Teaching Critical Thinking Through Student Self Analysis of Video Taped Seminar Discussions

by

James M. Miller, Doctor of Education

Utah State University, 1973

Major Professor: Dr. James P. Shaver
Department: Educational Administration

The main objective of the Cedar High School (C. H. S.) study was to develop a curriculum that would be useful to the social studies educator interested in teaching critical thinking skills to high school students. The model for teaching critical thinking that was followed during the C. H. S. study included three requirements. The first was to identify those critical thinking skills that would be useful to students during discussion of controversial issues. The second requirement of the critical thinking model was to teach these context specific critical thinking skills to students. This requirement was met by using a variety of materials, including a demonstration video tape that provided a written and verbal description of each of the critical thinking skills taught in the C. H. S. study followed by a demonstration of the skill. The third requirement of the model was that students who had been taught the critical thinking skills be given the opportunity to use the skills in realistic situations. This requirement was met by having students meet
in small groups to discuss controversial issues using the critical thinking skills which had been taught to them via the demonstration video tape.

An important part of the study was to record students on video tape during their discussions and then to have students view the video tapes and perform a self-evaluation as to how often they had used each of the previously identified critical thinking skills. This self-evaluation was performed using a Seminar Discussion Check List (S.D. C.L.) prepared as part of the C.H.S. study. The S.D.C.L. identified each of the critical thinking categories, and gave a verbal description of the skill, as well as providing an example of the skill in a conversational setting.

Students from a social issues and an American history class at C.H.S. were randomly assigned to three treatment classifications. The classifications included video, audio, and non-media groups. The video and audio groups were recorded on video or audio tape for later self-evaluation by students using the S.D.C.L. The non-media group, which was designated the control group, was not recorded but carried out its self-evaluation from memory.

The effectiveness of the video tape procedures was assessed with a posttest-only control group design, using analysis of covariance as the statistical technique with students' overall grade point average (G.P.A.) as the covariate for the first series of posttest given in November, 1972, and with G.P.A. and November posttest scores as additional covariates for a second posttest given in December, 1972. The second series of posttest were given to assess any variability in the critical thinking retention rates among students in the three treatment classifications.
The dependent variables were the Social Issues Analysis Test No. 1, (SIAT No. 1) and the Watson-Glaser Critical Thinking Appraisal (W. G. C. T. A.). The S. D. C. L. was also used as a dependent variable. Inasmuch as it was impossible to get individual scores from audio tapes of student discussions, an analysis of variance using group means on the S. D. C. L. was performed.

The hypotheses were that students in the experimental video discussion groups in the social issues and American history classes would have higher November and December posttest mean critical thinking scores on all three dependent variables than would students in the audio and non-media discussion groups. The null hypothesis, however, was accepted for each hypothesis.

It was recommended that social studies educators continued to investigate the effectiveness of the three-step model for teaching the critical thinking process. It was also recommended that additional research be conducted to assess the relative effectiveness of video and audio tape feedback as part of the minicourse model for teaching. A final recommendation was that additional research be conducted concerning the effectiveness of an observational system such as the S. D. C. L. as an instrument for self-evaluation and as a device for collecting research data.
CHAPTER I
THE PROBLEM

One of the greatest challenges in American education today is the selection of appropriate goals for the social studies curriculum in the public schools. The search for suitable goals in the social studies field has been intensified recently by the concern of some adults that the "youth culture," with its music, mores, and philosophy, is part of a collapse of the "American" way of life. Politicians of various persuasions have called upon the schools to become accountable for the non-academic attitudes as well as the intellectual learnings of their students. Students, on the other hand, have emphasized that the school has no right or responsibility to propagandize them with what they consider to be "trite clichés."

This conflict between the "establishment" and the "youth culture," sometimes called the "generation gap," provides an example of one of the major problems facing social studies education, the obvious inability of large segments of American society to understand the different values and goals of other segments of society. Not only have social studies educators failed to help our citizens understand that value conflicts are a normal part of a society which encourages individualism in a pluralistic context, but they have too often failed to provide instruction in the skills necessary to resolve these conflicts in a thoughtful way.
There are undoubtedly times in a student’s school day, outside of the social studies classroom, when issues are discussed and conflicts are resolved. Although these instances are a natural part of an on-going social process, their occurrence, helpful though it may be, tends to be accidental or at least incidental to the regularly planned classroom activity. These incidental occurrences are likely to be meaningful to students because they are discussions of existing problems. But it is doubtful that a student will become proficient in a process of problem solving or critical thinking through encountering conflict situations without some guidance in strategy and skill development. It is the responsibility of the social studies curriculum builder to purposely plan and present to students situations which will allow for decision-making in a thoughtful, reflective way.

Social studies educators, according to Shaver (1970, p. 2), have “taken on the mantel of citizenship education” and because of the acceptance of this responsibility the designer of the social studies curriculum must provide opportunities for students to react to thought provoking social issues that allow individuals to form value judgements and reach conclusions necessary for good citizenship.

The social studies curriculum designer and teacher should have a clear conception of the importance of pluralism—a spectrum of value commitments—to the decision making processes of a democratic society, of the ethical nature of the society’s basic decisions, of the role of values in providing justification for ethical decisions, and of the vague and competing nature of values in our society. He must be able to put his attempts to strengthen students’ commitments and to help students clarify and apply values in the context of the democratic commitment to human dignity and to the use of intelligence which
differentiates man from the lower animals. His position must be more than the euphemism that controversy if good in and of itself.

But he must not only have a clear rationale based on the nature of our society and its values, but he must behave in accordance with that rationale in the classroom. The discussion of issues should take place in the context of the clarification of values and value conflicts, not as an imposition of values by the teacher. A clear model of the role of values in critical thinking--something that is now mission from available social studies textbooks--must guide his teaching. (Shaver, 1970, p. 11)

The discussion of value conflicts or of conflict management has been largely ignored in the social studies curriculum in favor of a structured approach that stresses the memorization of historical facts which are to create somehow an understanding of the "American ethic" and develop the skills of good citizenship.

The fact is, however, that social studies educators are being pressured to make their curriculum offerings more meaningful in terms of society's present need to have citizens who understand the roots of conflict and possess the skills to thoughtfully resolve these differences. Blake and Mouton (1970) alluded to this problem recently when they stated that:

_classroom learning methodologies that could enable men to gain insights regarding conflict and acquire skills for resolving it seem to be impoverished. To aid men in acquiring both the conceptual understanding for managing conflict and the skills to see their own reactions in situations of conflict, man-to-man feedback seems to be an essential condition._ (Blake and Mouton, 1970, p. 417)

A social studies classroom that attempted to implement the suggestions given by Blake and Mouton (1970) for teaching citizenship education would need
to accept the hypothesis that it is possible to "gain insights regarding conflict and to acquire skills for resolving it." (p. 417)

The research reported in this paper is the result of just such a hypothesis. The methods used to gain the "insights regarding conflict" and the acquisition of "skills for resolving it" are based on curriculum models for citizenship education developed primarily by Oliver and Shaver (1966) and by Shaver and Larkins (1969). The events which prompted this particular study did not begin with the researchers just mentioned, however; but rather with an attempt to evaluate the impact of educational offerings at Cedar High School, in Cedar City, Utah.

J. Clair Morris, then the school's principal, conducted a study (Morris, 1968) extending over the period 1962 to 1968, to evaluate the broad scope of innovative programs being tried at Cedar High School. These programs had been developed on the basis of ideas and educational prescriptions set forth by teachers, parents, and students from Cedar City, with additional help from personnel of the School Plant Planning Laboratory at Stanford University. Included were team teaching, independent study, small group study, phasing, non-graded classes, continuous progress programs, vocational programs, and rotating and modular schedules.

Morris' (1968) study was aimed at assessing achievement (in mathematics, science, social studies, reading, listening and writing), attitudes, library skills, education aspirations, sociometric status, and school dropout rate. Tests were administered in April of each of five years, with the
school year 1962-63 used as the base year for comparing student progress, as it was the last year Cedar High used a so-called "conventional" method of instruction. In three areas, Morris (1968) found significant differences that indicated a downward trend in student achievement following the introduction of the innovative program. These areas were: study habits and attitudes, library skills, and critical thinking.

Table 1, reproduced from Morris' dissertation (1968, p. 99) shows the findings for critical thinking skills using the Watson-Glaser Critical Thinking Appraisal as the testing device. (See page 84 for a discussion of the Watson-Glaser Critical Thinking Appraisal.)

Table 1. Comparison of means for the Watson-Glaser Critical Thinking Appraisal as reported by Morris (1968, p. 99)

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<tbody>
<tr>
<td>1962-63</td>
<td>61.13</td>
<td>4.68**</td>
<td>3.94*</td>
<td>1.27</td>
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<tr>
<td>1964-65</td>
<td>60.48</td>
<td>4.03*</td>
<td>3.29*</td>
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<tr>
<td>1966-67</td>
<td>59.86</td>
<td>3.42*</td>
<td>2.67*</td>
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<tr>
<td>1965-66</td>
<td>57.19</td>
<td>.74</td>
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<td>1967-68</td>
<td>56.44</td>
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*Significant at the .05 level.
**Significant at the .01 level.
As Morris noted:

Critical Thinking Skills: Students scored significantly higher in critical thinking skills in the conventional year of 1962-63, than they did in the years of 1965-66 and 1967-68, during which the individualized method was in operation. The 1962-63 group did not score significantly higher than did the 1966-67 and 1964-65 groups; however, the conventional group did, in each case, have higher mean average [sic.] scores than did any of the individualized groups. The null hypothesis was rejected in favor of the conventional group. Relative to critical thinking, the conventional approach was superior to the individualized approach. It is recommended that Cedar High make a concerted effort to determine specific causes for the significant decrease in critical thinking skills and take steps to eliminate such causes. (Morris, 1968, pp. 127-128)

In an attempt to reverse the downward trend in critical thinking that has been identified by Morris at Cedar High School, a year-long study (Miller, 1970) was carried out to develop a program that would teach students, in a systematic way, a set of critical thinking skills. These skills were comparing, summarizing, observing, classifying, interpreting, criticizing, looking for assumption, imagining, and hypothesizing. These skills were taught as part of an experimental individualized, continuous progress, multi-media program in American history.

A control group of students used as their American history guide a packet or outline which had been used for several years at Cedar High School. The control group packet was designed to teach American history using a more traditional approach with stressed factual recall rather than the discussion of issues.

The experimental American history packet was designed to do four things. The first was to help students become aware of those skills generally
accepted in educational circles as being critical thinking skills. Second, it gave instruction to students in the use of these skills by discussion of such topics as "describing the world around us," "testable statements," "telling how sure we are," "proof process," handling "value judgements, statements of preference, dilemmas and loaded statements" and "argumentation" Oliver, Shaver, Berlak, Seasholes, and Godfrey, Learning to Think Critically, 1963, Table of Contents). Third, the packet identified for students the "Socratic method" of conducting a discussion. The Socratic method is a probing, questioning type of discussion technique used in most instances by a teacher and directed at an individual student. This technique was used in the discussion periods which were held during the study, and an introduction to the method was thought to be helpful in preparing students to respond to this discussion approach.

When the students had completed this three part introduction to critical thinking skills, they were then required to use these skills in written assignments and discussion groups. The written work and discussion groups were the fourth section of the American history packet mentioned earlier.

The main purpose of the 1970 study at Cedar High School was to determine if students in the experimental American history program would show a greater mean gain in critical thinking skills, as measured by the Watson-Glaser Critical Thinking Appraisal, than would students in the control American history course. There also was interest in determining if the emphasis placed on critical thinking with the experimental group would affect the
students' knowledge of the traditional social studies content. There were
three pretests given at the beginning of the study. The first was the School
and College Ability Test (SCAT, 1957), given to provide data on the scholastic
aptitude of the students involved in the study. Analysis indicated that there
was no significant pre-study difference in the academic abilities of the experi-
mental and control groups as measured by means on the SCAT. Also admini-
stered was the Sequential Test of Educational Progress (1957), used to assess
students' knowledge in the social studies area. The third test was the Watson-
Glaser Critical Thinking Appraisal, which was given to provide data on the
pre-treatment critical thinking ability of the students in the 1970 study at
C.H.S.

At the conclusion of the year-long study, students were again admini-
stered the Watson-Glaser Critical Thinking Appraisal and the STEP to assess
their ability to think critically and their knowledge in social studies.

Table 2 summarizes the results of the STEP pre and posttests. An
analysis of the difference between the means of the control and experimental
groups on the pretest (Form 2-A) yielded a t-ratio of .31, not significant at
the .05 level. On the STEP Form 2-B, given at the conclusion of the study,
an analysis of the mean difference yielded a t-ratio of .49, also not signifi-
cant at the .05 level.

Table 3 is a summary of the results of the analyses of the Watson-
Glaser Critical Thinking Appraisal scores during the studies conducted by
Morris from 1963 to 1968 and by Miller in 1970. This table shows that the
Table 2. Comparison of means for the Social Studies Portion of the STEP from the 1970 Cedar City High School Study

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<td>47</td>
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<td>56.44</td>
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</tbody>
</table>

downward trend in critical thinking at Cedar City High School from 1963 to 1968 contrasted sharply with the mean score of the experimental group in the 1970 study. The mean difference between the posttest means of the control and experimental groups in the 1970 study was two hundredths of a percentage
point away from being statistically significant at the .05 level. Despite the lack of a statistically significant difference, the finding had educational significance in light of the pattern of means for the years 1965 through 1968. Additional research in this important area seemed clearly worthwhile.

The need for further research in the critical thinking area was also indicated by the examination of one of the part scores from the STEP test. The description of this test (STEP Teachers Guide, 1959) mentioned that one of the areas measured by the STEP was the "area of 'Skills.'" Listed under this heading were the "skills" of "making generalizations, identifying values, distinguishing fact from opinion, comparing data, and drawing conclusions." Because the model of critical thinking for Miller's (1970) study included the identification and resolution of value conflict in a historical context, the sub-area of "identifying values" was selected for further analysis.

As reported in Table 4, the "identifying values" pretest mean for the control group using Form 2-A, was 63.12. That group's posttest mean on Form 2-B was 58.89. The experimental group had a beginning mean of 60.93 on Form 2-A and a posttest mean on Form 2-B of 61.05. The control group students showed a loss in their ability to "identify values," while the students in the experimental group showed a slight, but not statistically significant, gain. Despite what must be considered a chance difference, these data, along with the data provided by the Watson-Glaser test, provided additional impetus for further research into methods of teaching critical thinking.
Table 4. Difference in mean gain-loss changes in the ability to identify values for the skills portion of the STEP from the 1970 Cedar City High School Study

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest mean</th>
<th>Posttest mean</th>
<th>Mean change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>63.12</td>
<td>58.89</td>
<td>-4.23</td>
</tr>
<tr>
<td>Exp.</td>
<td>60.93</td>
<td>61.05</td>
<td>+ .12</td>
</tr>
</tbody>
</table>

Also the findings of the 1970 study came about during the use of a critical thinking packet which included the requirement for participation in seminar discussions that stressed the use of critical thinking skills. The effectiveness of the written assignments in teaching critical thinking, as compared with the discussion sessions as a critical thinking teaching method, was not assessed. The students in the control group also had seminar discussions, but the discussion in the control group was directed more toward the recall and sequencing of historical facts than toward the discussion of the value conflicts that accompanied historical events. It was indicated in the summary of the study (Miller, 1970) that the use of seminar sessions as "vehicles" to teach critical thinking skills needed to be explored more fully.

It was noted that:

The teacher evaluation sheets and the daily log kept during the seminar sessions, for example, are replete with statements indicating growth and development in the skills of discussion, particularly in the experimental group. These skills were never actually measured, so of course, cannot be reported. It is hoped that a future study at Cedar High School might measure this growth using such devices as the SIAT #4 (Oliver and Shaver, 1966) or the
ACOS (Shaver and Larkins, 1969). Both of these devices were developed to measure student responses in a seminar-type situation.

A possible area for further research using devices of the type just mentioned would be the video taping and subsequent self-scoring of seminar sessions by students. Some research of this type has already been done in Cedar City schools concerning the video taping of teachers in their classrooms. This tape is then replayed by the teacher in a self-analysis situation.

The possibility of video taping a seminar session and then having each student evaluate his own performance has great potential. Students could possibly use simplified versions of the SIAT #4 (Oliver and Shaver, 1966) or the ACOS (Shaver and Larkins, 1969) to evaluate their own critical thinking skills in seminar situations. Any time a student can see and analyze his own performance the possibility for real personal development exists. (Miller, 1970, p. 62)

Following up on the above recommendation, an extensive search of the literature was conducted for information about studies that had used video tapes to provide feedback for student self-evaluation. There was available a sizeable quantity of literature reporting instances of feedback to teachers or prospective teachers through the use of video tapes, but no report was found of an investigation of the use of this technique to teach critical thinking in social studies. This lack of assessment of the value of video taped seminar sessions in teaching critical thinking skills was the research problem for this study.
CHAPTER II
REVIEW OF LITERATURE

As the problem statement has suggested, the four main areas of interest in this study were: first, teaching critical thinking; second, the use of video tapes for teaching purposes; third, the use of seminar discussions; and fourth, the use of student self-analysis through the evaluation of video-taped seminar discussions. There is, needless to say, a rather limited supply of reports of other studies that have examined a combination of these four topics. This review will, therefore, summarize pertinent research and literature in each of the four main areas of interest and then attempt to synthesize the various findings.

Definitions of Critical Thinking

The term "critical thinking," as widely used to refer to intellectual operations, apparently has varied meanings. A pioneer research effort to clarify and teach "intellectual operations" was made by Glaser in the early 1940's. For the purposes of his research, Glaser identified intellectual operations as the ability to "think critically," and further stated that the specific skills involved were:

(1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experiences, (2) knowledge of the methods of logical inquiry and reasoning, and (3) some skill in applying these methods. (Glaser, 1941, p. 6)
Glaser failed to enumerate the specific skills needed for "logical inquiry and reasoning," but other researchers have been more helpful. One of these is Ennis (1964) who defined critical thinking in the following way:

A critical thinker is characterized by proficiency in judging whether:
1. A statement follows from the premise.
2. Something is an assumption.
3. An observation statement is reliable.
4. A simple generalization is warranted.
5. A hypothesis is warranted.
6. A theory is warranted.
7. An argument depends on an ambiguity.
8. A statement is overvague or overspecific.
9. An alleged authority is reliable. (Ennis, 1964, pp. 599-600)

The definitions used by other researchers are more brief than was Ennis'. Gotesky (1966, p. 180) stated that a critical thinker must be able to "(1) draw proper conclusions . . . (2) find relevant evidence for a conclusion. . . . (3) isolate the issue or issues involved." Rust (1962, p. 253) identified critical thinking as the process of evaluating arguments and assessing the way in which conclusions are reached."

In reviewing two studies of the ability of Catholic students to think critically, O'Neill (1966, p. 386) stated that critical thinking "roughly" is the "ability to use and analyze logically statements and arguments." Renner (1969, p. 199) in reporting a study of the teaching of critical thinking as part of a general physical science course in college, referred to critical thinking as the "ability to exercise a reasoned opinion involving careful judgment and to make correct assessment of statements." Davidson (1969, p. 702) stated that the term critical thinking "refers to thinking processes that go beyond
recognition or recall of factual data." Frank (1969, p. 298) chose to use as
his definition of critical thinking: "the correct assessing of statements."

Kemp, in reporting on a study of critical thinking and its relationship
to open-closed belief systems, used a rather lengthy listing of critical think-
ing skills which included:

1. The ability to define a problem.
2. The ability to select pertinent information for the
   solution of a problem.
3. The ability to recognize stated and unstated assumptions.
4. The ability to formulate and select relevant and promis-
ing hypotheses.
5. The ability to draw conclusions validly and to judge
   the validity of inference. (Kemp, 1963, p. 321)

In reporting another study, Hyram (1957, p. 126) referred to critical
thinking skills as "mental activities which: 1. seek to infer valid implications;
2. attempt to demonstrate; or 3. try to systematize knowledge. . . ."

Anderson, Marcham, and Dunn identified the skills of critical thinking
they attempted to teach as:

(1) identifying specific facts; (2) selecting relevant facts;
(3) organizing facts in terms of meaningful sub-topics; (4)
arranging sub-topics in logical order; (5) making inferences
from specific facts and from trends; (6) distinguishing be-
tween fact and opinion; (7) recognizing situations in which
insufficient evidence makes it difficult or impossible to draw
a clear-cut conclusion. (Anderson et al., 1944, p. 242)

Rothstein listed these as critical thinking skills:

1. Comparing sources of various kinds.
2. Interpreting data, drawing inferences, and finding
   assumptions.
3. Identifying strong and weak arguments.
4. Evaluating thinking as to its relative criticalness
   or dogmatism.
5. Developing sensitivity to language and meaning.
6. Augmenting student ability to draw conclusions from evidence and in differentiating fact and judgment. (Rothstein, 1960, p. 1141)

In a study by Creutz and Gezi (1965, p. 366), the following skills were stressed: "evaluation, interpretation, identification of causal relationships, awareness of trends, and effective use of informational resources."

A summary of these definitions, because of their diversity, would be extensive. However, the definitions do refer more often to some skills than to others. The ability to identify fact and opinion is mentioned frequently, as is the ability to draw a conclusion. Recognition of assumptions and formulating hypothesis are also mentioned.

An attempt, however, to draw a concise, complete definition of critical thinking from this review of definitions leaves one in a frame of mind to agree with Goldmark (1966, p. 329) who observed that "There is little agreement as to what a person should do to qualify as a critical thinker. . . ."

Taba's statement in 1965 still appears to hold true: "The problem of defining critical thinking is still before us." (p. 532)

It may be that the problem is not, as Taba (1965) implied, a lack of any definition for critical thinking, but rather one of too many general definitions. This possibility was alluded to by Berlak (1965, p. 5). After examining some of the current lists of critical thinking skills, he stated, "If the schools attempted to equip persons to cope with all these domains, they would have an entirely unmanageable task."
He went on to suggest a possible remedy:

The use of general steps assumes a knowledge about the thinking process that is simply not available. . . . We do not, at the present, have the general theories, principals, or models from which we can make precise predictions, shape pedagogical strategies, write the textbooks that would aid us in teaching thinking effectively. . . . What I am suggesting is that educators rely less on the inadequate general models and focus on studying intellectual processes in a given area in order to develop output, criteria and models that appear to characterize successful output for that area. From these context specific models and criteria, educators may develop pedagogical strategies and teaching material that are appropriate for that area. (Berlak, 1965, pp. 7-8, italics mine)

Of the research studies reported in the current literature, the two that seemed most close to Berlak's (1965) suggestion for teaching critical thinking from a "context specific model" were the Harvard Social Studies Project and a follow up to it, the Utah State University Social Studies Project (Shaver and Larkins, 1969, 1973 a, b). The Harvard study, as reported by Oliver and Shaver (1962, 1966), attempted to establish a "model" for critical thinking in social studies based on the needs of citizenship education, especially the analysis of public issues. The Harvard Project was aimed at the legal-ethical dimension of reflective thinking, or what was termed a "jurisprudential" framework. The U.S.U. Project also selected concepts to be taught on the basis of their relevance to handling political-ethical disputes.

One of a collection of articles edited by Shaver and Berlak (1968) is a discussion of the "jurisprudential framework" by Oliver and Shaver.

Under the heading, "Operational Objectives of a Jurisprudential Social Studies Curriculum," it is stated that:
A student should be able to:
1. Deal with political controversy at a general analytic level and relate his analysis to specific issues and concrete cases.

2. Identify inconsistencies and conflicts between two or more values, empirical statements, or definitions.
3. Deal with inconsistencies and conflicts between values by identifying an array of situations in which the inconsistent or conflicting values are presented in varying degrees of favorableness or unfavorableness in order to delineate at what point he should support one value as against the other.
4. Deal with inconsistencies and conflicts between empirical statements by seeking and evaluating specific evidence to support the statements.
5. Deal with the inconsistent or ambiguous use of words by seeking evidence concerning how the words are most commonly used, or how the concepts which the words label may be most accurately described.
6. Distinguish between those factual claims which are relevant to the central value issues in a controversy and those claims which bear little or no relationship to the value.

The level of specificity with which these operations are stated above, we think makes the problem of assessing a student's ability to perform any of them less difficult than assessing whether or not a student has learned to use some general process called "critical thinking" or "problem solving." (Oliver and Shaver, 1968, p. 431)

The main objective of the jurisprudential social studies curriculum, according to Shaver and Oliver (1964, p. 192), is to "teach a scheme for handling public controversy focused on three kinds of problems: (1) Settling factual issues; (2) Handling problems of word usage and meaning; (3) Dealing with value conflicts."

The idea expressed by Berlak (1965) of identifying "context specific" definitions of critical thinking for a given area was followed for the 1972 study at C.H.S. The "intellectual processes" were identified as the "Operational Objectives of a Jurisprudential Social Studies Curriculum" stated by Oliver and Shaver (1968). The use of this "definition of intellectual
processes in a given area to develop output, criteria and models" (Berlak, 1965, pp. 7-8) is discussed in the Curriculum Design section of this report.

**Critical Thinking Research and Social Studies**

In a recently published article, Skinner (1971) charged that, at the present time, students are not learning the skills of critical thinking. Skinner went on to say:

Critical thinking can be developed through appropriate classroom practices, but teachers must remember that this development does not take place automatically and must therefore direct their teaching toward this end. (Skinner, 1971, p. 375)

Skinner summarized the steps he thought were necessary to remedy the problem with this statement:

Teaching for critical thinking and the testing or evaluation for critical thinking go hand in hand in the learning process. . . . I believe that the evaluation of critical thinking is very important and will improve the teaching for critical thinking. With a concerted effort on the part of teachers, this myth can be dispelled. (Skinner, 1971, p. 375)

There is available in current literature some reports of curriculum projects and research studies that have been designed in such a way that the concerns expressed by Skinner (1971) have been, to some extent, alleviated.

An example of research in critical thinking in the social studies area was reported by Rothstein (1960). He used an American history course to teach critical thinking skills and obtained positive results. Rothstein (1960) first identified a list of thinking skills that he hoped to teach in a thirty-five week course in American history. These skills were then presented to
students using American history as a "vehicle to teach critical thinking." Rothstein (1960, p. 1141) was able to conclude, based on test results from the Watson-Glaser Critical Thinking Appraisal, that "American history taught in the manner described developed a student's ability to do critical thinking more so than a 'conventional' course taught to a comparison group."

The results of the U.S.U. Social Studies Project reported by Shaver and Larkins (1969) are of interest because of several factors. First, it was conducted in a Utah setting, in a high school similar to Cedar High School. Second, it made use of the research and curriculum development of the Harvard Project, as did the 1972 study at Cedar High School. Third, it used situations containing value conflicts that provided opportunities for students to learn to apply the skills of critical thinking as did the study at C.H.S.

The U.S.U. study was designed to identify and teach students an Outline of Concepts for the Analysis of Public Issues (Shaver and Larkins, 1969, p. 78; 1973 a, pp. xi-xvi).

The identification of the concepts and suggestions for teaching them were presented as part of thirty-six "teaching bundles." The teaching bundles began with a "Note on Purpose," a statement of "Objectives," and a "Note on Procedure," followed by "Teaching Suggestions." Also, situations were presented which give students the opportunity to analyze "public issues," including value conflicts.

The U.S.U. study also used modifications of the "recitation" and "socratic" styles of teaching used in the Harvard Project, along with a "seminar" teaching style.
The research efforts of the U.S. U. Project were aimed at student personality-teaching style interactions as they might affect the learning of the concepts included in the "Outline of Concepts for the Analysis of Public Issues."

Shaver and Larkins (1969) decided that research had clearly established that students taught a set of concepts would perform better on tests measuring those concepts than would students who had not received the special instruction. Consequently, the U.S. U. study made no provision for a control group of students who would study the regular social studies curriculum teaching the Outline of Concepts. The decision was also made by Shaver and Larkins (1969) to assign randomly their students to treatment, and to use a posttest-only, control group design.

In drawing implications from their study, Shaver and Larkins stated that:

It should be kept clearly in mind that the research of the U.S. U. Project was aimed at the assessing of the relative impact of teaching style, not at the assessment of the effectiveness of our curriculum in teaching analytic skills, as compared to some other curriculum. (Shaver and Larkins, 1969, p. 268)

As to the final results of their study, Shaver and Larkins stated that:

Looking at both the Harvard and the U.S. U. Projects, we can conclude that teaching style seems to have little differential effect on the learning of analytic concepts: at least in the case of the styles and concepts of interest in these two projects. (Shaver and Larkins, 1969, p. 269)

The studies by Oliver and Shaver (1966, 1968), Rothstein (1960), and Shaver and Larkins (1973 a, b), can probably best be summarized by Shaver's
statement in 1962 following a review of critical thinking research:

Probably the most conclusive suggestion supported by the research reviewed here is that we should not expect that our students will learn to think critically as a by-product of the study of the usual social studies content. Instead, each teacher should determine what concepts are essential—e.g., that of relevance—if his students are to perform the intellectual operations deemed necessary to critical thinking such as, for example, the formulation and evaluation of hypotheses. Each of these should then be taught explicitly to the students. . . . Situations as similar as possible to those in which the students are to use their competencies should also be set up in the classroom, and the students guided in application of the concepts in this context. (Shaver, 1962, p. 16)

The use of this three-step curriculum model to teach critical thinking skills is discussed more fully in the design section of this dissertation because it provided the basis for the procedures that were followed during this study to teach "context specific" critical thinking skills as proposed by Berlak (1965).

**Video Tape Research**

A review of research concerning video tapes turns readily to the "Minicourse" development program of the Far West Laboratory, just as a critical thinking review for social studies turns to the Harvard Project. The ideas and procedures exemplified by the minicourse concept have led to a wide variety of techniques for using video tapes in various teaching-learning situations. Some of these general ideas for using video tapes will be reviewed, and then a more comprehensive statement of the use of the minicourse concept, as developed by the Far West Laboratory and used as a model for this study, will be given.
Brophy (1971), in an article titled "VTR Integral to Classroom Instruction," presented a comprehensive review of a wide variety of situations where video tapes have been used by students to evaluate their own behavior. He reported that at San Jose (California) State College, students in a bookkeeping methods class were video taped and the tapes were then played back for self-analysis.

Professor Dale, instructor of the bookkeeping methods class, says the T.V. tape recording adds considerable interest and precision to the study of business teaching methods. Students in this year's classes seem to be more alert and observant about the quality of teacher demonstrations--both their own and their fellows than ever before. (Brophy, 1971, p. 36)

At Sacramento State College, Brophy found a sales demonstration class where:

Video tape speeds up learning on all points by enabling students to see themselves as others see them--several times preferably--and to rate their own performance in terms of what it takes to become an expert sales person. (Brophy, 1971, p. 38)

At Yale University, according to Brophy, students are recorded and allowed to perform self-evaluation of their performance in such diverse places as the medical school, the psychology and sociology departments, and in various areas of the communication field.

In a study reported by Wilkerson (1970), a group of fifth grade students at Kansas State Teachers College, Emporia, Kansas, learned how to produce video tape recordings of themselves in a study of social problems. Such topics as "Is it ever all right to break the law?," "People Who Protest," and "The Challenge of City Living" were discussed and the discussions taped for later
self-evaluation of how well the topics were understood by the students. The impact of this approach, which is similar to the one used in the 1972 C.H.S. study, was not formally assessed and no research data were provided by Wilkerson (1970). He did report, based on teacher observation and students' comments, that this method helped students to understand and discuss current issues.

In an article titled, "Raising Student Self-Esteem (for a change)," Ferris (1971) described how the student use of video tapes helped to restore "self esteem" to a group of "dummy, third tracker, reluctant learners." These students prepared "man on the street" interviews, where they discussed how they felt about school.

Although there were many technical flaws, the show was funny enough and true enough to be quite well received. And best of all, the kids who made it sat happily through seven or eight showings. (Ferris, 1971, p. 381)

Onder described a study in which video tapes were used in a mental institution to help patients regain their mental health.

The visual feedback or self-confrontation method of psychiatric treatment consists of playing back to the patient video tapes of himself. . . . A patient, watching and listening to himself interact with others receives a clear picture of how he behaves and how he must look to others. . . . The ultimate objective of visual feedback is to expedite the patients return to realistic perceptions. (Onder, 1970, p. 23)

The majority of those treated in this manner, according to Onder (1970), made varying degrees of progress toward full mental health.

In a study reported by Deiker, Crane, and Brown (1971, p. 134), the relationships between repeated self viewings on closed circuit television
and the self concept and personality needs of student speakers was assessed.

The study was based on the statement by Carl Rogers that "The congruency of actual and ideal self concept is critical to human growth."

Based on their findings, Deiker et al., concluded that:

the self viewing students tend to develop a more realistic self concept, as reflected by the amount of correspondence to instructor ratings, than do the students without self viewing. (Deiker et al., 1971, p. 140)

In a report of research pertaining to skills in "speech pathology," Boone and Stech (1970) described their efforts to compare audio tape and video tape self confrontation as clinical training techniques. Boone and Stech (1970, p. 48) concluded "that VTR self confrontation is a practical and feasible educational methodology and that its effects can be distinguished from more traditional approaches.

Video tapes have also been used for teaching communication skills.

In one study, Mulac (1968) found that speech students at Eastern Michigan University who viewed video tapes of two of their class performances demonstrated significantly greater overall speech skill and bodily action, personality, language and voice skill than did those students who did not view themselves on video tapes. Mulac, using standardized speech tests, found that:

the video tape group improved forty percent more than the audio tape group. Therefore, the improvement in speech skill brought about by the two twenty-minute exposures to video-tape feedback during the semester was both statistically significant and pedagogically meaningful. (Mulac, 1968, p. 125).

In a similar study, Hawkins and Engbretson (1967, p. 2) used "video tape recorded playbacks as a variable in mastery of a basic speech course."
Their findings were inconclusive in that the groups involved in their study showed no difference in speaking ability as measured by three objective tests of speech performance. They did conclude, however, that most of their students seemed enthusiastic about the use of video tape playbacks.

Studies which provide data on the use of video-taped replays in teacher training are also available. For example, Soloman and McDonald (1970) asked teacher trainees to make a brief presentation demonstrating a teaching act, but the trainees were given no standards to meet nor information of what was expected of them. The results of the study showed that feelings of anxiety were produced, and that feelings of dissatisfaction were expressed by those in the study. The researchers were able to:

conclude that self viewing on video tape will not lead to any desirable attitude or behavioral change unless it serves as feedback, that is information about the amount of departure from desired performance. (Soloman and McDonald, 1970, p. 285)

Roberson (1970) described a system for teacher self evaluation (TSA), which provided teachers with feedback to use in observing and evaluating their performance in the classroom. Roberson's (1970) system included four phases. First, the teacher must define what he wants the students to learn and how he intends to accomplish that end. This means that the teacher, as in the Shaver (1962) model, must determine his objectives and select appropriate teaching methods. The second phase is to make a video tape of the lesson that has been planned. A camera and video tape recorder are brought into the classroom to record the teacher's performance. The third
phase involves playing back the tape, and recording the teacher’s behavior on a TSA score card, also prepared by Roberson. The items to be evaluated are:

1. The teaching method the teacher is using.
2. The affective objective the teacher intends
3. The cognitive objective the teacher desires.
4. The teacher’s verbal expressions.
5. The teacher’s non-verbal expression. (Roberson, 1970, p. 10)

The fourth phase of Roberson’s evaluation process includes the analysis of the collected TSA information. In this phase the teacher compares his stated objectives with his observed behavior. Roberson (1970, p. 12) gave no statistical analysis of his work but stated that “an important result of all TSA programs has been an increased teacher awareness of the effect of different instructional patterns.”

Ward (1970) reported some pertinent findings based on a research design very similar to that used in the 1972 study at C.H.S. He used two groups of teachers in his study, one group which acted as a control group and the other as his experimental group. The experimental and control groups viewed Minicourse 3, produced by the Far West Lab, and followed all the procedures for completion of that course. The control group teachers then taught their classes in their regular manner. The experimental group taught their classes as usual, but were recorded on video tape for later self viewing and rating. They were also rated by a team of evaluators who were trained to identify the kind of "questioning behavior" called for by Minicourse 3. Ward concluded that:
Self evaluation by using a model video tape in conjunction with one's own video tape, and self evaluation by reflective thinking with purposeful direction when utilized in a distributed time procedure, both appear to positively affect teaching behavior. The results of this study indicated that teacher behavior was affected when a model video tape was utilized following the criteria of evaluation pursued in this investigation. (Ward, 1970, p. 94)

To focus this review of literature on the uses of video tape more directly related to the 1972 study at C.H.S., it will be helpful to examine research reported by Olivero (1970) and by Borg, Langer, and Kelley (1970 b) relating to microteaching and the development of the minicourse. Olivero (1970, p. 33) summarized the microteaching research which had been done by Bush, McDonald, Gage, and Allen at the Stanford Research and Development Center as it related to the development of the Stanford Teacher Competence Appraisal Guide. This guide was used to carry out the evaluation of teacher behavior that had been recorded during micro-teaching sessions. In the Stanford model for using video tapes, the teacher is recorded while presenting a brief lesson to a small group of students. Then, with the help of supervisors who have strong academic competencies in given subject fields, the teacher evaluates his teaching methods. A variation on the microteaching model for teacher evaluation was developed in the "mimicourse" by the Far West Laboratory for Educational Research and Development.

Borg, Kelley, Langer, and Gall (1970 a, p. 232) began their process of expanding on the microteaching model of teacher training by identifying what they considered to be "the three aspects of teacher education . . .
Borg et al. (1970a) then decided to concentrate on the classroom skills component of teacher training. This decision came about according to Borg et al. (1970a) because of the belief "that methods courses are relatively less effective in meeting their objectives than are courses in the other two major components of teacher education." The second reason for this decision (Borg et al., 1970a, p. 233) was that "preliminary findings suggested that the microteaching technique being tried at Stanford University could be developed into a powerful tool for improving teacher performance."

The instructional model around which the Laboratory has developed inservice training courses is an adaptation of the microteaching approach developed at Stanford University, and employed in the Stanford Intern Program (Bush and Allen, 1963; Allen and Fortune, 1966). As developed at Stanford University, microteaching has the following basic characteristics: (1) the intern studies a specific teaching skill; (2) attempts to apply the skill in a short video-taped lesson, usually five to ten minutes in length, with four or five pupils; (3) watches a replay of the lesson with a supervisor who provides feedback; (4) replans the lesson, reteaches it to another group of four or five pupils, and receives further feedback. The inservice courses we are developing are called "minicourses" to differentiate them from other instructional models that employ the microteaching approach. The minicourse model differs from the Stanford model in several ways. The minicourse model provides a self-instructional package that can be used in any school where a video-tape recording system is available. The minicourse provides feedback through self-evaluation and/or peer interaction while the Stanford Intern Program employs supervisors to provide feedback. The minicourse relies heavily upon illustrations by model teachers rather than supervisory feedback to provide the trainee with an operational definition of the behavior patterns or skills to be learned. Research evidence suggests that models are more effective than supervisory feedback. . . . (Borg et al., 1970a, p. 233)
Borg et al. (1970 a) stated that the minicourse had five "advantages" when compared with conventional teacher educational programs. First is the fact that the minicourse is self-contained and can be used in most classrooms. Second, it provides the opportunity to try out new ideas in a less difficult situation than a regular classroom. Third, the minicourse provides the chance to learn skills through actual practice. Fourth, it provides immediate "feedback" using the video tape replays. And, finally, the minicourse "focuses on specific skills" while most other teacher training methods do not.

In an attempt to assess the impact of minicourse training on teachers' classroom behavior, Borg et al. (1970 b) identified and analyzed teachers' use of thirteen classroom behaviors before and after being exposed to minicourse training. The thirteen behaviors were:

1. Number of times teacher used redirection.
2. Number of times teacher used prompting.
3. Number of times teacher used further clarification.
4. Number of times teacher used refocusing.
5. Number of times teacher repeated his/her own questions.
6. Number of times teacher repeated pupil answers.
7. Number of times teacher answered his/her own questions.
8. Length of pupil responses in words (based on 5 minute samples of pre- and post-tapes).
9. Number of 1 word pupil responses (based on 5 minute samples of pre- and post-tapes).
10. Length of teacher's pause after question (based on 5 minute samples of pre- and post-tapes).
11. Frequency of punitive teacher reactions to incorrect pupil answers.
12. Proportion of total questions that called for higher cognitive pupil responses.
13. Proportion of discussion time taken by teacher talk.

An analysis of "pre-tape" and "post-tape means" indicated that nine of the thirteen behaviors (#1, 2, 3, 5, 6, 7, 8, 9, 13) assessed after the
teachers had completed the minicourse training were significantly improved at the .001 level, one (#12) was improved at the .005 level, and one (#10) at the .05 level. The other area (#4), was not scored because of "technical problems." (Borg et al., 1970 b, p. 235)

A three year follow-up of teachers trained in Minicourse 1 was also reported by Borg (1972). Videotape recordings of each of 24 experimental teachers were made before, immediately after, four months after, and 39 months after training. These recordings were analyzed to compare the level of teacher performance on each specific skill covered in Minicourse 1 at each of four checkpoints.

The ten areas of teacher performance analyzed were: redirection, prompting clarification, repeating own questions, repeating pupil answers, answering own questions, length of pupil response, one-word pupil responses, higher order questions and teacher talk.

An analysis of variance revealed that on the post-course evaluation the subjects were significantly above their precourse level on all ten behaviors. Comparisons between performance before the course and on the four month follow-up revealed significant differences on nine behaviors. After 39 months, the performance of the subjects was still significantly superior to their pre-course performance on eight of the ten behaviors that were scored.

Borg et al. (1970 a, pp. 237-238) concluded "that within five years the Far West Laboratory will have developed courses that improve teaching skills in virtually all of those areas essential for maintaining an effective learning situation."
Because of the apparent effectiveness of the minicourse model for teaching specifically identified skills, it was decided to attempt to adapt the minicourse model of teaching to the Shaver (1962) model for teaching critical thinking for the C. H. S. study.

The use of the minicourse model to teach critical thinking used many of the ideas and some of the materials developed by Gall, Weathersby, Elder, and Lai (1972) in a project conducted at the Far West Laboratory in Berkeley. During the project, titled Discussing Controversial Issues, Gall et al. (1972) developed a series of video tapes (Minicourse 14) which demonstrate specific discussion skills that are helpful when discussing controversial issues.

Four specific discussion techniques have been identified. They are:

1. Have an open discussion in which people feel free to say what they think.
2. Listen to others and keep the discussion focused.
3. Analyze different points of view.
4. Evaluate the effectiveness of a discussion. (Teacher Handbook, Front Cover)

These discussion techniques are sub-divided into objectives for moderators and participants (see Appendix A), which identify specific kinds of behavior that moderators and participants should use if they are to develop skills for discussing controversial issues effectively.

Four demonstration tapes are viewed by the moderators and student participants as a part of "lessons" which identify and provide examples of specific discussion techniques mentioned earlier.

The teacher handbook for Minicourse 14 then makes specific provisions for tape-recording seminar discussions for later self-evaluation by the teacher.
No provision is made, however, for students to use the tapes to evaluate their discussion skills. This seems to ignore a potentially productive opportunity for students to obtain feedback on their own use of skills for discussing controversial issues.

There is available, however, a "Student Evaluation Packet" which provides a "Discussion Evaluation Form" for each of the four discussion skills. Students are asked to rate themselves as to whether they "did" or "didn't do" each of the skills listed for that discussion (see Appendix F). This evaluation is performed by the student at the conclusion of the discussion while still in his discussion group but without viewing a videotape recording of his discussion. According to the student evaluation packet, this evaluation should be used to "stimulate a discussion about the discussion" and to "focus" on things that went well, problems that occurred, and ways to improve future discussions. The use, in the C.H.S. study, of the ideas and materials developed by Gall et al. (1972) was part of the overall use of the Minicourse model developed by Borg et al. (1970 a).

After a rather comprehensive review of minicourse offerings, Borg et al. concluded

... many research questions remain unanswered. Nevertheless, the staff of the Laboratory Teacher Education Program believed that enough research evidence existed to develop a new model of teacher training--the Minicourse model--which would be a significant improvement over traditional approaches. (Borg et al., 1970 a, p. 52)

The minicourse model, as stated by Borg et al., is made up of three parts:
First, the learner must be given a very clear definition of the specific skill he is to master. Whenever possible, this definition should include a visual model or example, since seeing a skill performed provides a more precise definition than hearing or reading about it. Second, the learner must have an opportunity to practice the skill. Preferably, initial practice should occur under simpler and less demanding conditions than those found in full class teaching situations. Third, the learner must receive specific feedback on his practice that will help him to bring his performance close to the model or definition. (Borg et al., 1970a, p. 17)

This model was modified for "student training" as the basis for the preparation and use of video tapes to teach critical thinking for the C.H.S. study.

Borg et al. (1970a, p. 27), in referring to the Minicourse stated, "We are concerned with the shaping of specific classroom skills and behavior patterns required by the teacher for effective teaching." That sentence could be paraphrased in terms of the shaping of specific classroom skills and behavior patterns required by the student for effective thinking, to describe the purpose of the 1972 study at C.H.S.

Seminar Discussions

"Why use a discussion approach?" This question is asked by Gall et al. (1972, p. 1) in the introduction to the teacher handbook for their Discussing Controversial Issues project from the Far West Laboratory. They answered their own question this way:

It is useful when it is your goal to make ideas and subject matter relevant to students, and to teach ways of thinking and behaving. Probably the chief virtue of discussion is that it engaged people personally.
Additionally, controversy is a fact of contemporary American life. New issues appear daily on television and in the newspaper. Significant issues are everywhere in the school curriculum: in civics, science, history, homemaking, literature, speech, art. Since controversy is so much a part of our lives, schools need to prepare students to cope effectively with it. Furthermore, schools themselves are social institutions and full of controversies involving human relations. Discussing immediate interpersonal or classroom issues can help students develop better coping strategies and create a better atmosphere for learning. One of the main goals of an issue-oriented discussion is to develop students' insight into their own and other peoples' opinions. A good discussion makes ideas, beliefs, and values accessible to analysis, criticism, and new insights. Another, more practical, goal is to give students the opportunity to develop discussion skills. (Gall et al., 1972, pp. 1-2)

There is, however, a lack of research into the impact of student discussions similar to the lack of research into student analysis of videotaped seminar discussions to teach critical thinking. Apparently, not much research has been done to find out what happens to students in seminar discussions, and, as a result, a combination of opinion and research articles must be relied on.

One area of research interest has been the questioning techniques useful to teachers interested in developing students' discussion skills. In a review of studies relating to what they called the "cognitive emphasis of teachers' classroom behaviors, Davis, Morse, Rogers, and Tinsley (1969) found that the questions in textbooks, tests, and other instructional materials were almost universally directed to the student's use of recall or memory. They also referred to a study conducted in 1912 which showed that teachers did most of the talking in class "discussions," and indicated that studies in 1960 and 1964 confirmed the findings of the 1912 study.
Set against this type of evidence, the frustration of half a century's rhetoric about problem solving and critical thinking is obvious and perhaps monstrous. (Davis et al., 1969, p. 713)

Other more recent studies, the development of minicourse for example, have been aimed at teaching teachers how to talk less and listen more. And, perhaps even more important for those desiring to use seminar discussions in a meaningful way, teachers have been learning how to ask questions that cause students to go beyond simple recall in dealing with the issues before them.

Zahorik (1971), for example, reported on training teachers to use techniques that would help stimulate student discussions. He suggested that when:

Pupils become question askers, at least instructional method will reflect the real world and quite possibly as teachers take their role as question answerers seriously and see themselves as honest facilitators of pupil learning, materials organization and other aspects of the school may also change. The question regarding questioning in the classroom, then, is not what kinds teachers do or should ask, but how to promote pupil question asking and how to answer the questions that are asked. (Zahorik, 1971, p. 36)

Crow and Burke (1970), both assistant professors of history, discussed some of the reasons for turning to the seminar discussion, especially in history courses. One reason is due to what Crow and Burke (1970) call a "paradox." While history publications are now among the nation's best sellers, students often find history courses painful and dull. The first reason, the authors felt, for this "paradox" was that:

our students have encountered the same objective "facts" two or three times in their experience and have in all probability found
them related each time in the same chronological, narrative fashion—denying concern for subjective relevance. (Crow and Burke, 1970, p. S12)

Crow and Burke (1970) saw as an alternative system of education one which first of all used the "motivational" aspects of seminar discussions.

Since heavy reliance on dynamic student-centered seminars allows peer pressure to stimulate emotional involvement and personal responsibility in the business of learning, they can replace considerable lecture time. (Crow and Burke, 1970, p. S13)

One other aspect of seminar discussions that the available literature mentions is the student-led discussion, rather than teacher-led discussion. Inasmuch as the study at Cedar High School also used student leaders in many discussions, the results of this research are relevant. Gruber and Weitman (1962) found that students who met in small discussion groups without a teacher did as well on a final examination as students who worked with a teacher, and in addition were superior in curiosity, as measured by question-asking behavior. Those in the student-led group also reported a larger number of "outside readings" during the time the discussions were held.

A study by Webb and Grib (1970) also related to the effectiveness of student-led discussions. They noted that students reported that the sense of freedom to ask questions and express their own opinions is a major advantage of the student-led discussion.

After a review of research relating to the discussion method of teaching, Wallen and Travers (1963) were able to draw some generalizations concerning seminar discussions. Generalization Number 8 (Wallen and Travers, 1963, p. 485), was that "Group process appears more effective than
direct attack in changing expressed attitudes and certain aspects of behavior.

The majority of the research reviewed by Wallen and Travers (1963), however, alluded to group discussion techniques as a means of gaining factual information, rather than the teaching of a process such as critical thinking.

One of the best statements available on discussion groups was provided by McKeachie.

We had also predicted that any superiority of student-centered discussion methods would be revealed in higher-level outcomes. In 11 studies significant differences in ability to apply concepts, in attitudes, in motivation, or in group membership skills have been found between discussion techniques emphasizing freer student participation compared with discussion with greater instructor dominance. In 10 of these the differences favored the more student centered method. . . . The more highly one values outcomes going beyond acquisition of knowledge, the more likely that student-centered methods will be preferred. (p. 1140). Moreover, if students are to achieve application, critical thinking or some other higher cognitive objective, it seems reasonable to assume that they should have an opportunity to practice application and critical thinking and to receive feedback on the results. Group discussion provides an opportunity to do this. (McKeachie, 1963, p. 1132)

"Feedback on the results" of group discussions, as mentioned by McKeachie (1963), was provided during the C.H.S. study through the use of video or audio tape recordings of the discussion sessions. Adair and Kyle (1969) stated that:

An adequate feedback-evaluation system should possess the following characteristics to the greatest possible extent:
1. It should reproduce the teaching (discussion) performance completely and reliably.
2. It should be objective.
3. It should provide immediate feedback.

The use of video tape recording procedures has the three characteristics of an adequate feedback system listed above. (Adair and Kyle, 1969, p. 1)
Two additional studies which have examined the processes of group discussions and helped to provide the rationale for the procedures used in the C.H.S. study were conducted by Sugrue (1970) and by Shaver and Larkins (1969). Sugrue (1970, p. 202) investigated "student-teachers' attitude-congruence patterns and student evaluations of controversial social issues and classes." She assumed (Sugrue, 1970, p. 202), prior to conducting the study, that the reasons "for the hesitancy of teachers to make social issues inclusions in their classrooms were the lack of adequate instructional models and concerns for possible negative affective reactions on the part of the students."

The "concern" that exists among some teachers as well as patrons of the public school concerning the discussion of controversial issues was discussed recently (Shaver, 1972) in an attempt to identify what the role of education should be as it relates to the values of the students who attend the public schools.

The democratic commitment to human dignity, especially if students are considered to be humans, has much to say about what the school should be doing, and what parents should demand it does, about values. If one takes seriously the ideal of the human as a thinking, intelligent being with the right to control his own destiny, it is clear that the school's role is not to impose values. Instead, an important aspect of the schools' legitimate concern with the improvement of intelligence should be helping students to clarify (and learn how to clarify on their own) the standards they use in making decisions about worth. To be assisted in becoming aware of what one's values are, to be helped to verbalize them, both in terms of intellectual and emotive meaning, to be aided in defining and applying value terms, and to be urged to be aware of the consequences of acting in accordance with certain commitments--these would be valuable services for students and the society. This basic position--that the schools' role is to assist students develop a basis
for their values that is as rational as possible, along with the analytic concepts to continue the clarification after leaving school—is a basic theme for discussing values and schooling. . . . (Shaver, 1972, pp. 19-20)

This statement by Shaver (1972) provided the rationale that was used in the C.H.S. study to allow students to "become aware" of, and to have the opportunity to "verbalize" their beliefs on a number of controversial, value laden issues, used as discussion topics in this study. These topics are identified in Appendix C, but the rationale for their use as a framework to teach critical thinking in the context of the discussion of public issues followed the suggestions given by Shaver (1972).

In an attempt to determine the effect of discussing controversial value laden issues, several aspects of students' affective behavior in discussion groups where controversial issues were discussed were investigated by Sugrue (1970). Her study assessed students' affective reactions while discussing twelve topics which were considered to be controversial. Several of these issues were also discussed in the C.H.S. study, including topics such as race, Viet Nam, censorship, and family planning.

As part of her study, Sugrue (1970) administered the matched Michigan Social Issues Teacher Questionnaire and the Michigan Social Issues Student Questionnaire as well as the Minnesota Student Attitude Inventory to students who had been discussing controversial issues. After evaluating the research findings, Sugrue concluded that:

It does not appear that teachers can "go wrong" by including social-issues discussions in instruction. Not only were social-issues teachers well evaluated in general, but all the
variables of this study related to the actual discussion of issues indicated that positive student responses were given when issues were actually discussed. This was true without regard to the occasional problems that appeared to relate to the students' basic perceptions of the issues "as issues." It was found that students, in general, had a high belief in student expression and that teachers were well evaluated when their belief in expression was as high or higher than the students." These findings are clearly supportive of social issues discussions, and should help to remove any hesitancy teachers might have regarding the inclusion of social issues in instruction. (Sugrue, 1970, p. 230)

The finding by Sugrue (1970) that students had a high belief in self expression and that social issues discussions were felt by students to be an effective means of expressing their views was of interest in designing the C.H.S. study. The decision to use social issues discussions as the vehicles for student practice of critical thinking skills during the study at C.H.S. was strengthened by the findings of Sugrue (1970). However, the rather general information she provided, while of interest, did not provide the specific model of student discussions used in the C.H.S. study. For this model, it was necessary to turn to the U.S.U. Project (Shaver and Larkins, 1969).

This project conducted by Shaver and Larkins (1969, p. 209) had "two major thrusts: one in curriculum development, the other in research." The curriculum phase of the project is discussed elsewhere in this paper, but the research portion of the U.S.U. Project which dealt with "student personality-teaching style interactions" is of interest in this section of this report.

The U.S.U. Project replicated part of the Harvard Project (Oliver and Shaver, 1966) in that the Harvard Project had compared the effectiveness
of two teaching styles, "recitation" and "socratic," as did the U.S.U. Project. The U.S.U. Project, however, added one more teaching style, called "the seminar" (Shaver and Larkins, 1969, p. 209).

The U.S.U. study was designed so that each of these teaching styles was used with small groups of students discussing public issues after studying analytic concepts presented in "teaching bundles."

The basic design, then, involved three treatments—recitation, seminar, and socratic teaching, with students assigned randomly to treatment, and with each of four teachers using each treatment twice and assigned randomly to his discussion group. (Shaver and Larkins, 1969, p. 213)

The seminar approach, as used in discussing issues in the U.S.U. Project, provided the model for the discussion groups in the 1972 Cedar High School study.

In this style, the students are presented with a case, as with the recitation and socratic discussions, told that their task is to discuss the case, trying to identify the issue it poses and coming to a decision about the issue, applying the concepts that had been studied in the regular class meetings. The teacher's role, the students were told, is to answer questions that they might have (to serve as an information–idea source) and occasionally to help structure the discussion by suggesting relevant concepts. (Shaver and Larkins, 1969, p. 212)

The design of the seminar groups in the 1972 study at C.H.S. followed this model, with the only variation being the presence of the VTR and audio recording equipment during the discussions.

Research on Verbal Interaction

There are many reasons why few attempts at process evaluation are made. No neat, scientific research design is probable.
Assumptions inherent in the models for statistical analysis of the data must be violated. The researcher doesn't have a tenth of control he would like. Subjectivity is rampant. At times, one feels he is attempting a task as impossible as analyzing the water at a given point in a moving stream. A dweller in educational research's ivory tower can cite such reasons for refusing to dirty his hands in such messy projects and convincing others that nothing valid can come of work which necessarily produces tenuous inconclusive findings. Granted, there is little one can say with certainty, but clues do become evident and trends do appear. (Karl, 1970, p. 1)

This statement which is taken from a presentation made to the American Educational Research Association and the National Council on Measurement in Education at their conference in Minneapolis in 1970, accurately describes many of the problems faced by the researcher. who tries to measure the "process" of critical thinking or decision making in the context of discussions of political-ethical issues.

Much of the literature available describing the evaluation of discussion behavior is based on classroom interaction analysis. Probably the best definition of classroom interaction analysis comes from Flanders (1970) who stated that:

Classroom interaction analysis refers not to one system, but to many systems for coding spontaneous verbal communication, arranging the data into a useful display, and then analyzing the results in order to study patterns of teaching and learning. Each system is essentially a process of encoding and decoding, i.e., categories for classifying statements are established, a code symbol is assigned to each category, and a trained observer records data by jotting down code symbols. Decoding is the reverse process: a trained analyst interprets the display of coded data in order to make appropriate statements about the original events which were encoded, even though he may not have been present when the data were collected. A particular system for interaction analysis will usually include (a) a set of categories, each defined clearly, (b) a procedure for observation and a set of ground rules which governs the coding
process, (c) steps for tabulating the data in order to arrange a
display which aids in describing the original events, and (d) sug-
gestions which can be followed in some of the more common
applications. (Flanders, 1970, pp. 28-29)

Crispin (1970) described the Flanders System of Interaction Analysis
as being the system that is the best known and most widely used. The Flanders
system, according to Crispin (1970), classifies all teacher statements as direct
or indirect and then divides these categories into seven subcategories which
describe types of teacher behavior.

There are three categories of student behavior in the Flanders system:
student talk-response, student talk-initiation and "silence or confusion."

In the Flanders System, we see that the basic technology of inter-
action analysis includes (1) a system and (2) a technician. A system
includes theory-assumptions about human interactions—carefully
definite categories of behavior, ground rules, methods of training
observers, checks on observer reliability, methods of tallying
behaviors and methods of tabulating the data. The technician is
the medium through which the system is manifest. (Crispin,
1970, p. 16)

Crispin (1970) also mentioned that the use of observation systems
for changing teacher behavior has problems associated with observers and
feedback to the teacher. The problem with observers is finding a trained
person willing to spend the time necessary to collect the data in the class-
room. The problem of feedback is that if analyzing the data obtained by
the observer involves a long delay, the enthusiasm of the teachers who are
awaiting information may dwindle.

There is available a sizeable quantity of literature describing various
research projects which have used either the "Flanders System," or some
modification of the system in an attempt to assess teacher verbal behavior.

In a study of third grade students, Aspy (1971, p. 626) attempted to measure "levels of empathy, congruence and positive regard provided by the teacher. . . ." Aspy's (1971) study involved the use of audio tape recordings of teachers in their classroom teaching. These tapes were sent to a university to be scored by trained raters, and the results were sent to the teacher by mail. This information, according to Aspy (1971), even with the inconvenience and delay, provided teachers an opportunity "to come to grips with the issue of just how effectively they were implementing their belief that the human being is important in their classroom."

Another study (Dillon, 1971) which attempted to assess oral discourse using the Flanders (1970) system is of interest because the teachers to be evaluated were recorded on video tape, as were the "video group" students in the C.H.S. study. The purpose of Dillon's (1971) study was to assess the amount of "teacher talk" used by student teachers as opposed to the amount of "student talk" which took place in the classroom. Dillon (1971) reported that teachers became more indirect in their teaching when video taped and critiqued on two occasions. He (Dillon, 1971, p. 65) concluded, "It is reasonable to assume that video tape has an influence on improving student-teacher relationship in the classroom."

Roush and Kennedy (1971, p. 220) studied the possibility of changing teacher behavior with interaction analysis. Their hypothesis was that if
teachers could "learn and apply the Flanders Verbal Interaction Analysis System (FVIAS), their verbal classroom behavior will be more indirect than teachers not learning and applying the system." Using control and experimental groups, they found a significant change in teacher verbal behavior in the group obtaining feedback from the Flanders System.

The Flanders System, which has been more widely used than other systems and is, therefore, better known, is not the only system available for evaluating student and teacher verbal behavior, however. For example, Massialas (1970) described the development of another category system to analyze issue-centered classroom discussion. Massialas (1970, p. 4) noted "that certain cognitive operations--orientation, definition, hypothesis, explanation, evidencing, generalization--can be used productively in the classroom to help the discourse on the examination of social issues."

The main goals in constructing the category system described here are to provide an instrument which permits one to classify meaningfully spontaneous classroom discourse focused on social issues... As with other category systems, the Michigan Category System can be used (a) to get a better understanding of the dynamics of instruction, (b) to provide objective feedback to the teacher for assessing his classroom performance... and (c) to give researchers a system of logical categories and a set of procedures in determining the interactive communication patterns in the classroom. (Massialas, 1970, p. 96)

The Michigan Social Issues Cognitive Category System consists of nine basic categories, eight of which are cognitive and one of which is identified as non-cognitive. These categories are further subdivided into more specific categories to make a total of twenty-six.
Massialas' (1970) interaction analysis system followed most of the procedures already discussed. The data were collected on audio or video tapes, scored, and then placed on an interaction analysis matrix by trained raters. Massialas (1970) stated that the devices used to identify these kinds of behavior were helpful in recording and evaluating verbal interaction in the classroom, but that much research remained to be done to identify other needed improvements.

Of the reviews of devices for observing classroom behavior, none is more complete than Mirrors for Behavior II, edited by Simon and Boyer (1970). This anthology of observation instruments contains examples of seventy-nine observation instruments that have been identified as useful by the editors of the volume.

These seventy-nine systems cover a wide range of phenomena including cognitive processes, affective processes, non-verbal behaviors, activities, interactions with materials, and sociological phenomena such as who is doing what to whom with what reaction. Each system in this anthology can be thought of as representing one or more sets of behaviors or roles. (Simon and Boyer, 1970, p. 3)

Simon and Boyer (1970) discuss each of the seventy-nine systems and give the following information pertaining to its use:

Settings in which system is used;

Subject of observation;

Number of subjects observed;

Uses reported by author;

Data collection and coding methods and personnel;

Category dimension of the system.
It is beyond the scope of this review to attempt to discuss all the instruments in this anthology, but one of the instruments reported there (Oliver and Shaver, 1970) helped provide the model for the observation instrument used in the study discussed in this report. The guidelines that were followed to select this system were stated by Shaver and Larkins (1973 b) when they made this statement concerning the development and use of an observation system for a specific research project, such as the study at C.H.S.

When no extant system is appropriate to his theoretical frame, the researcher is faced with a difficult choice between validity and generalizability. Although the proliferation of instruments is not likely to lead to cumulative findings, theoretical validity is the more important concern. If the available observational instruments (e.g., Medley and Mitzel, 1963; Simon and Boyer, 1967) do not provide an adequate description of the independent variable, it is better to construct a new system rather than use an invalid one. (Shaver and Larkins, 1973 b, p. 13)

After reviewing the systems available for evaluating verbal interaction, the decision was made by the writer to modify an existing system for use in the C.H.S. study, rather than use a possibly invalid system that had been designed for another study. This was done in the attempt to have the modified system more accurately reflect the critical thinking skills taught during the C.H.S. study.

Using an observational system to assess students' behavior in a discussion setting was mentioned by Shaver and Larkins (1973 b) as a "promising" alternative to paper and pencil tests. By using an observational system
to code the content of ongoing (or recorded) discussions, it is not necessary to fragment and structure the thought processes for the student; aspects of the discussion are not selected for the student to analyze (at least not in discussions not lead by a teacher), nor is he provided with a set of responses from which to choose . . . The use of systematic observation to assess critical thinking does not circumvent validity questions. The specification of the behaviors to be categorized and valued should be based on a carefully developed model of thinking. (Shaver and Larkins, 1973b, pp. 16-17)

This requirement to use an observation system, based on a "carefully developed model of thinking" was the rationale that was followed in developing the Seminar Discussion Check List (S.D.C.L.) used in the C.H.S. study.

The observational system discussed by Simon and Boyer (1970) and mentioned earlier as providing the model for the observation system used in the C.H.S. study was designed by Oliver and Shaver (1970). Their system, *Categories for an Observation System to Describe Teacher Style and Learning Outcomes*, is made up of two main sections, dynamic categories and static categories. The dynamic category has three parts: "Consistency--Inconsistency . . . Specification and Generalization . . . and Qualifying . . ."(Oliver and Shaver, 1970, p. 16-3)

The static system consists of the following categories:

General Value Judgements
Specific Value Judgements
General Legal Claims
Specific Legal Claims
General Factual Claims
Specific Factual Claims
Source
Definitional Claim
Repetition
Definitions of the categories are provided as guidelines for classifying specific behaviors in the above categories. The observer can either be present in the classroom or score audio tapes of classroom interaction. The scoring of oral discussions using this system was discussed by Oliver and Shaver:

The translation of the objective of the jurisprudential approach into specific learning outcomes which can be measured with a set of categories such as described in this article presents, we believe unusual possibilities for curricular evaluation. (Oliver and Shaver, 1962, p. 61)

Oliver and Shaver (1966, p. 212) used this basic observation system to assess student behavior during the Harvard Social Studies Project, calling it Social Issues Analysis Test No. 4 (SIAT No. 4), *A System for Analyzing Free Discussion*. The system was modified for use in the U.S.U. Project by Shaver and Larkins (1969) as the Analytic Content Observation System (ACOS).

The Oliver and Shaver (1970) observational system is discussed in more detail in the data and instrumentation section of this report inasmuch as the system provided the model for the observational device used to assess student discussions during the study at C.H.S.

Although the literature did yield a model for use in assessing student behavior in the C.H.S. study, the review of research using observational
systems to assess verbal interaction was not particularly fruitful. The research reports were as important for what was not said as for what was said. The fact that no instance could be found in literature where students were given responsibility for evaluating their own discussion skills is most revealing.

In all of the reported instances where an observational system has been used to assess verbal interaction in classroom situations, someone other than the student used the data to perform evaluations.

A statement by Simon and Boyer (1970), summarizing the objective of providing for student self-evaluation, expresses an assumption underlying the C.H.S. study.

Using feedback for self evaluation against self-determined goals is one of the main strategies for moving from dependence to independence. Only as learners gain a realistic picture of their behaviors and compare them against their expectations is there less need to turn to outside authorities for direction. Through this process, learning comes from feedback which the pupil gets from his own attempts at mastery. This is analogous to learning in sports. In football, for example, the learner kicks the ball, and he can see whether or not his kick has worth an "A" or a "D." In fact, the outside evaluation of the kick is irrelevant to the obvious learning that comes from seeing where the ball went. What is needed is data about why the ball went where it did. (Simon and Boyer, 1970, p. 31)

The use of the modified Oliver and Shaver (1970) observational system during the C.H.S. study was intended to provide an evaluation instrument which was suitable for use by students rather than specially trained observers.
Summary

The main concern of this review has been to provide sufficient information about the four topics discussed to suggest the foundation for the procedures used in the study reported here. Because of this concern, at the risk of being redundant, an attempt will be made to synthesize these various concepts in a final statement.

The review of literature that pertained to critical thinking attempted to do several things. The first was to demonstrate the wide variety of terms that have been used to define critical thinking. Second, by referring to the ideas of Berlak (1965), the review indicated the need, when teaching for critical thinking skills, to identify those skills that are "context specific" to a particular type of problem. Shaver's (1961) three-step suggestion for teaching critical thinking was then cited as the model for the procedures used in the C.H.S. study. The review then turned to a discussion of studies where specific critical thinking skills had been identified and taught to students. The Harvard Project (Oliver and Shaver, 1966) and the U.S.U. Project (Shaver and Larkins, 1969) are examples of studies which most nearly followed the three-step design identified by Shaver (1962) as being necessary to teach critical thinking. The specific critical thinking skills taught during the C.H.S. study and the materials used for teaching these concepts are based on the developmental efforts of Oliver and Shaver (1966) and Shaver and Larkins (1969).
The review of video tape research then discussed studies which have used video tapes to teach a wide variety of skills. The emphasis in this section was a discussion of the Minicourse model for teacher education as developed by the Far West Laboratory for Educational Research and reported by Borg et al. (1970 a, b) and by Borg (1972).

This model was used in the C.H.S. study to provide direction for the preparation of a video tape demonstrating critical thinking skills for students and to give direction for recording student discussion sessions for later self evaluation.

The use of controversial value laden issues as discussion topics was reviewed (Shaver, 1972) and research was presented (Sugrue, 1970) which indicated that students encountered no problems in "affective behavior" during the discussion of controversial issues.

The findings of Shaver and Larkins (1969) were then cited as providing the model used in the C.H.S. study for conducting these seminar discussions. In this model, students are presented with a case or a situation which they are to discuss. Students are then asked to identify the issues the case poses, and to attempt to come to a decision about the case, applying the concepts for resolving the issue that had been taught in large group settings.

The next section of the review discussed procedures used to evaluate verbal interaction in seminar discussions through the use of an observational system.

The requirements for constructing an interaction analysis system as discussed by Flanders (1970) and Crispin (1970), and several studies which
have used observational systems to assess verbal interaction, were reported
(Aspy, 1971; Dillon, 1971; Massialas, 1970). The rationale for the system
used during the C. H. S. study was given (Shaver and Larkins, 1973 b) and a
discussion Check List used in the C. H. S. study (Oliver and Shaver, 1970)
was also presented.

A final statement (Simon and Boyer, 1970) concerning the desirability
of students conducting a self-evaluation to gain a realistic picture of their
critical thinking behaviors concluded the review. The use, in the C. H. S.
study, of a simplified version of the Oliver-Shaver observational system
which allowed students to perform a self-evaluation of their use of critical
thinking skills in seminar discussions was the result of the models suggested
in the final portion of the review.

The objective of the "Review of Literature" was to show that studies
are available which indicate that:

1. It is possible to identify and teach critical thinking skills.
2. It is possible to use video tapes to teach a variety of skills.
3. Seminar discussions, using controversial issues as discussion
topics, are suitable vehicles for practicing the use of critical
thinking skills.
4. It is desirable and possible for students to perform self-analysis
of their use of critical thinking skills through the use of video
tapes and a simplified observational system.

The apparent lack of research on the effects of teaching critical think-
ing through student self-analysis using video taped seminar discussions makes
the present investigation of some importance to educators interested in the three areas related to the teaching of critical thinking: student discussions, student self-analysis, and video feedback.
CHAPTER III

OBJECTIVES AND PROCEDURES

The identification of a decrease in critical thinking skills among students at Cedar High School (Morris, 1968) led to an expression of concern by responsible people in the school district. This concern was heightened by the fact that the decrease in critical thinking skills had taken place during a period when the staff at Cedar High School was engaged in a total school effort to develop a new and innovative program especially designed to meet the needs of each student. There seemed to be no readily identifiable reason for the decrease in critical thinking skills. In fact, the school population had remained stable and no downward trend was identified in the other cognitive areas assessed by Morris (1968).

The size of the decrease in critical thinking skills led to the belief among some staff members at C.H.S. that special attention should be given to developing a remedy. In addition, it appeared that the improvement of critical thinking was of sufficient interest to others in secondary education to warrant a formal study of an attempt to teach critical thinking at Cedar High School. It was decided (Miller, 1970) to attempt to teach critical thinking skills through the use of continuous progress packets and to study formally the effectiveness of the packets. This decision was based on the previous use of continuous progress packets in the social studies and
language arts areas at Cedar High. The decision to have instruction in critical thinking take place in a history course was due to the fact that the person who was to conduct the study was an American history teacher.

The results of the study conducted by Miller (1970) during the 1969–70 school year seemed to indicate that the downward trend in critical thinking skills identified by Morris (1968) had been reversed for the experimental group students (Table 4). While not statistically significant, the results of Miller's (1970) study seemed to be of sufficient educational significance to warrant further research into various classroom techniques that might be used to teach critical thinking.

It became amply clear from a review of the research available in the critical thinking area that there was no curriculum available to teach critical thinking using video taped seminar discussions. The main objective of the 1972 study at C.H.S. was to design such a curriculum to teach critical thinking. A secondary objective was to perform a limited assessment of the effectiveness of such a curriculum.

**Curriculum Development Objectives**

As has been mentioned earlier, there were available two guides to curriculum development that provided the basis for the curriculum development phase of this study. The first was the three step guide for teaching critical thinking suggested by Shaver (1962). The second was the use of the minicourse technique designed by Borg et al. (1970), to teach a variety of skills to teachers.
An important aspect of the curriculum objective was to develop a video tape based on the minicourse model to provide examples of the nine critical thinking skills identified for use in the 1972 study at C.H.S. An additional aspect of the curriculum development objective was to prepare an observation system that could be used by students to evaluate their own use of critical thinking skills in discussions.

The curriculum development portion of the study also included establishing procedures and selecting materials other than the video tape mentioned above, to teach critical thinking skills to students.

It was the objective of the curriculum phase of this study, then, to combine a modified version of the minicourse model of instruction identified by Borg et al. (1970) with the three-step model for teaching critical thinking identified by Shaver (1962), and to use the resulting instructional materials and procedures during a ten-week period at Cedar High School.

**Research Objectives and Hypotheses**

The first research objective of the study was to investigate the effect, in terms of critical thinking, of combining the teaching of critical thinking, using the minicourse method, with the study of social issues. The second research objective was to investigate the effect, in terms of critical thinking, of combining the teaching of critical thinking, using the minicourse method, with a study of American history. The third research objective was to investigate the effect, in terms of critical thinking, that a
thirty day non-instruction period would have on the retention rate of critical thinking skills among video, audio and non-media discussion groups.

These research objectives were sought using a posttest-only control group design (Campbell and Stanley, 1963, p. 24), with the first series of posttests being given in November 1972 and the second series of posttests being given in December 1972. The data were relevant to the testing of several hypotheses:

1. There will be significant differences among the means of treatment groups on the November posttests.

1a. Students in the experimental video discussion groups in the social issues and American history classes will have higher November posttest mean critical thinking scores on the Watson-Glaser Critical Thinking Appraisal than will students in the audio and non-media groups.

1b. Students in the experimental video discussion groups in the social issues and American history classes will have higher November posttest mean critical thinking scores on the Social Issues Analysis Test No. 1 than will students in the audio and the non-media groups.

1c. Students in the experimental video discussion groups in the social issues and American history classes will have higher November posttest mean critical thinking scores on the Seminar Discussion Check List than will students in the audio and non-media groups.
2. There will be significant differences among the means of the treatment groups on the December posttest.

2a. Students in the experimental video discussion groups in the social issues and American history classes will have higher December posttest mean critical thinking scores on the Watson-Glaser Critical Thinking Appraisal than will students in the audio and non-media groups.

2b. Students in the experimental video discussion groups in the social issues and American history classes will have higher December posttest mean critical thinking scores on the Social Issues Analysis Test No. 1 than will students in the audio and non-media groups.

2c. Students in the experimental video discussion groups in the social issues and American history classes will have higher December posttest mean critical thinking scores on the Seminar Discussion Check List than will students in the audio and non-media groups.

Analysis

The hypotheses were tested using two-way analysis of covariance (treatment and class as factors) for the Watson-Glaser Critical Thinking Appraisal and SIAT No. 1. Students' overall grade point average was used as a covariate for the first posttest and scores from the first posttest were
used as additional covariates for the second posttest. It was planned that if significant differences were found among the means of the three groups used in the C.H.S. study, on any of the dependent variables, a further analysis of the difference between pairs of means would be carried out using the Scheffé test (Ferguson 19).

A three-way analysis of variance was used to analyze the data collected from the Seminar Discussion Check List. The main effects tested by this analysis were date (November or December), treatment (video, audio, or non-media), and class (American history or social issues). The interaction between date and class, date and treatment, and treatment and date were also tested for significance. Because of difficulty in identifying individuals on the tapes used to score the S.D.C.L., group means were used in the analysis of the ten dependent variables—nine categories and total valued acts.

Procedures

Population and sample

The curriculum was used and its impact assessed with students at Cedar High School, Cedar City, Utah. Cedar City is a community with a population of about 10,000 people, located in the southwest corner of Utah. The economic base of the community comes from iron mines located west of Cedar City, and from agriculture and tourism.
Cedar City is predominantly "Mormon," with other religious beliefs comprising about 20 to 30 percent of the total population. This religious orientation contributes to a rather stable, conservative point of view.

Cedar City is the location of Southern Utah State College, a small four-year college. Cedar City is the home of the Utah Shakesspearian Festival, as well as other cultural offerings associated with the college, such as art shows, concerts, and ballet.

Cedar City has three elementary schools, a junior high school, and a high school. All except the junior high school building were built in the past 15 years, and a new junior high school is likely to be built within the next five years. The Cedar High School population is made up of over 95 percent caucasian students, with American Indian students comprising about 5 percent. At the time of the study, Cedar High had no black students and only two Mexican-American students. The over-all school population, then, was mainly white and middle-class.

Cedar High School is a comprehensive high school, with a wide variety of vocational and academic classes. Attendance by the approximately 650 students has averaged about 97 percent for each school year. Approximately 75 percent of those who graduate from Cedar High School go on to some form of post high school education, with about 25 percent of the graduates completing college.

The students in the study were selected from classes being taught in the social studies department. The social studies department has three
full-time teachers and meets approximately 450 students each day. The students in the study were selected from an American history class and a social issues class.

Inasmuch as C. H. S. is a non-graded high school, there are students from the 10th, 11th, and 12th grades in all classes. A special age group, therefore, was not identified for the study other than "high school age" students.

Design

The primary objective of this study was to design a curriculum that would provide the social studies educator with an example of methods to teach problem solving and critical thinking skills to high school students in the social studies classroom.

The social studies teacher, according to Shaver:

Must not only have a clear rationale based on the nature of our society and its values, but he must behave in accordance with that rationale in the classroom. The discussion of issues should take place in the context of the clarification of values and value conflicts, not as imposition of values by the teacher. A clear model of the role of values in critical thinking--something that is now missing from available social studies textbooks--must guide his teaching. (Shaver, 1970, p. 11)

Shaver and Larkins (1969, 1973 b) have provided a more complete model for the social studies educator interested in teaching the management of value conflicts through the process of critical thinking than has been provided in the C. H. S. study. The intent of the present study, however, has been to provide data concerning the use of bideotapes to assist students in
learning the skills of critical thinking while discussing the issues faced by a "multivalue" society.

Curriculum design

The curriculum design for this study followed the three steps identified by Shaver (1962) as helpful in designing a curriculum to teach critical thinking skills. His suggestions were:

(1) each teacher should determine what concepts are essential—e.g., that of relevance—, if his students are to perform the intellectual operations deemed necessary to critical thinking.

(2) Each of these should be taught explicitly to the students... a further step can be suggested: (3) Situations as similar as possible to those in which students are to use their competencies should also be set up in the classroom, and the students guided in the application of the concepts in this context. (Shaver, 1962, p. 16)

This model places upon the teacher, or other curriculum developer, the responsibility of identifying those skills he feels are necessary for critical thinking, teaching these skills to students, and then providing realistic situations where students might use the skills.

The first requirement of the Shaver (1962) model to "determine what concepts are essential" to perform critical thinking is an example of Berlak's (1965) suggestion, discussed earlier that the critical thinking skills to be taught be identified within a specific problem solving context.

The specific list of critical thinking skills used in the C.H.S. study were suggested by Oliver and Shaver (1962) in their discussion of the jurisprudential approach to the social studies. The jurisprudential approach to the social studies was defined by Oliver and Shaver as having three major sets of "concepts:"
1. Concepts which describe the basic values of American society, as well as the consent system designed to maintain and support these values. These include such values as personal freedom and personal privacy (e.g., speech, conscience, contract and property), equal opportunity, equal protection under law, peace and order, a concern for the general welfare and progress of the community, and concern for the welfare of each individual, i.e., brotherhood and charity.

2. Concepts related to the intellectual process by which ethical and empirical disputes can be more intelligently handled. These concepts would include the distinction between definitional, empirical, and normative problems as well as the proof process by which problems can best be handled.

3. Concepts from the social sciences which give the person a more adequate means of describing and handling descriptions of social phenomena, e.g., "culture" and "social class." (Oliver and Shaver, 1962, pp. 53-54)

The "intellectual operations deemed necessary to critical thinking" (Shaver, 1962, p. 16) that were taken from the Oliver-Shaver (1962) System for the C.H.S. study are:

1. Stating a value judgement.
2. Stating legal claims.
3. Stating factual claims.
5. Making definitional claims.
6. Using an analogy.
7. Using clarification or procedural controls to keep the discussion on the topic.

Two behaviors not part of the Oliver-Shaver model were added for use in the C.H.S. study:
8. Challenging the position of others in the discussion.
9. Supporting the position of others in the discussion.

These nine skills were identified as the "context specific" critical thinking skills to be taught in the analysis of public issues context during the Cedar High School study.

The second step of the Shaver (1962) curriculum model, after the identification of the "concepts," was that "each of these should be taught explicitly to the students" (Shaver, 1962, p. 16).

Curriculum components for teaching critical thinking

The general idea of the critical thinking approach to the discussion of public issues in a social studies context was presented to students using Taking a Stand, A Guide to Clear Discussion of Public Issues (Oliver and Newman, 1967). This booklet was selected to provide students in the C.H.S. study general information concerning the discussion of public issues. Such items as the purpose of discussions, carrying on a discussion with direction, and identification of issues, were discussed using the Taking a Stand booklet as a guide.

The Shaver model for teaching critical thinking, which incorporated Berlak's (1965) suggestion that context specific skills should be taught, was combined, in developing the C.H.S. study curriculum, with the minicourse model for teacher training as identified by Borg et al. (1970). The minicourse model has three requirements for its use as a teaching method:
First, the learner must be given a very clear definition of the specific skill he is to master. Whenever possible, this definition should include a visual model or example, since seeing a skill performed provides a more precise definition than hearing or reading about it. Second, the learner must have an opportunity to practice the skill. Preferably, initial practice should occur under simpler and less demanding conditions than those found in full class teaching situations. Third, the learner must receive specific feedback on his practice that will help him to bring his performance close to the model or definition. (Borg et al., 1970, p. 17)

The "clear definition" of the critical thinking skills to be mastered began with the Taking a Stand booklet, and was followed by the presentation of Minicourse 14, Discussing Controversial Issues. These video tapes, prepared by the Far West Laboratory for Education Research, identifies for students and teachers four suggestions for productive discussions of public issues:

(1) Have an open discussion in which people feel free to say what they think.
(2) Listen to others and keep the discussion focused.
(3) Analyze different points of view.
(4) Evaluate the effectiveness of a discussion.
(Gall et al., 1972)

The Minicourse 14 tapes were selected to provide to the students a visual model of the general discussion skills that the Taking a Stand booklet had previously identified. This rather general introduction to the discussion skills was followed by a video tape which was developed to demonstrate the nine specific critical thinking skills identified for the C.H.S. study. The script for the demonstration tape (see Appendix B) was prepared using ideas and some of the dialogue provided in Taking a Stand (Oliver and Newman, 1967).
The students who demonstrated the skills on the tape were volunteers from a drama class at C.H.S. The drama teacher agreed to have her students help with the production of the video tape as a part of the class work during the year. When the students had the script memorized, they met in the T.V. studio with the writer and the C.H.S. media coordinator. The media coordinator helped to solve the technical problems that arose during the recording sessions.

The VTR (video tape recording) equipment at Cedar High School during the time the study was in progress included a Concord T.V. camera and recorder. Also used was a sound "mixing" system with several microphones available to feed into the recorder from the discussion groups.

The demonstrations of the specific critical thinking skills were performed by the student volunteers and the performances recorded on video tape over a period of several weeks as the student volunteers memorized their parts and reported for taping sessions. The demonstration tape was made in the same room using the equipment arrangement (see diagram) which was used to record the video discussion group during the ten-week study.
When the part of the tape containing the student demonstrations of critical thinking was completed, a printed list of the nine critical thinking skills used in the tape was prepared on a bulletin board using a "letter set" and then videotaped. A narrative description of the nine critical thinking skills used in the study was then recorded on the sound tract accompanying the printed description of the skills. These two tapes, the first containing the student discussions and the second the printed and narrative descriptions of the nine critical thinking skills, were then fed through a monitor and recorded on a third tape (see diagram) so that each section of the "description of skills tape" was followed by the student performance of the skills described.

Additional materials were also selected for practicing the critical thinking concepts during the discussion of public issues. The students in the history class used as their discussion guide a booklet, *American History and Critical Thinking* (Miller, 1970), prepared for use in the Cedar High School American history department. This booklet identifies controversial issues that were sources of conflict in the various historical periods being studied.
The current issues class used as the focus for their seminars a series of booklets published by the Silver Burdett Company. The series contains such titles as Communication, Race, Poverty, Drugs, Youth Culture, Extremists Right and Left, Violence, Authority, and Destiny. The specific topics discussed by both classes and the schedule of discussion are included in the Appendix.

The final component of the curriculum developed for teaching critical thinking was the Seminar Discussion Check List (S. D. C. L.). The S. D. C. L. was developed as an assessment tool for students to use for performing a self evaluation of their use of the nine critical thinking skills identified for the C. H. S. study. The S. D. C. L., which is discussed fully in the Data and Instrumentation section of this report, was developed so that students could use it as a check list and score sheet while observing the taped replays of their seminar discussions.

Design of classroom presentation

The time schedule for the presentation and use of the above components began with the opening of school in August, 1972. The presentation of the materials began with the distribution of the Taking a Stand booklet to each student in the social issues and American history classes. The booklets were read and discussed during class time, with the students reading and then discussing in a total group setting the issues outlined in Taking a Stand. This presentation took one week to complete.
The presentation of the Minicourse 14 tapes to the students in both classes involved in the C.H.S. study was focused on the student portion of the discussion skills demonstrated and also took one week to complete. One tape was presented each day for four days, followed by a class discussion of the techniques demonstrated on the tape. The fifth day was a review of the previous four days' viewings and discussions. A copy of the Minicourse 14 outline is included in the Appendix.

The presentation of the C.H.S. demonstration tape, which was designed to identify specifically the critical thinking skills taught during the C.H.S. study, was then made to all students in each of the two classes in the C.H.S. study.

It should be noted that all of the materials mentioned thus far were presented to students in a setting which involved all class members. After the presentation of these materials, the students in each class were then randomly assigned to the video, audio, and non-media treatment classifications and the use of the differing experimental feedback procedures was begun.

The final step of the curriculum design used in the C.H.S. study was based on the third requirement of the Shaver (1962, p. 16) model: "to provide situations as similar as possible to those in which students are to use their competences." Since students in the C.H.S. study were being taught critical thinking skills to be used in the context of the discussion of public issues, the third requirement was met by having students meet in seminar groups to discuss a variety of controversial topics.
Teachers were present during these discussions to assist students "in the application of the [critical thinking] concepts" (Shaver, 1962, p. 16), but the teachers very rarely "led" the discussion in the sense that they "called" the students to order or re-directed the discussion back to the day's topic.

The topics for discussion in the social issues class were selected by the writer before the class begun, but the sequence in which they were considered was determined by class members. The topics were listed and each student was asked to select a topic in which he or she had a particular interest. The consideration of each topic began on Friday of each week when the topic for the next week was introduced. At this time one of the booklets described earlier, (Violence, Drugs, Youth Culture, etc.) which provided information on the topic under consideration was handed to each student in the class. The rest of the class period on Friday was spent in reading the booklet. On Monday and Tuesday students who had chosen that particular topic as their special interest area made presentations on it to the class. The students were free to give their views and opinions, bring in guest speakers, or use any kind of presentation they felt would best identify the issues that made the topic controversial.

On Wednesday, the students divided into three discussion groups in which they had the opportunity to state their positions on the issue being considered and to react to the views of the other students in their group. On Thursday, the students once again met in their discussion groups to evaluate their use of critical thinking skills during the Wednesday discussion.
The American history class followed similar procedures using social issues in an historical context, except that the classroom presentations preceding their small group discussions were led by the teacher on some occasions when the teacher thought his background in American history would help clarify the issues being discussed.

Research design

Students in social studies classes at Cedar High School have traditionally been separated into five or six sub-groups of eight to twelve students by the social studies teachers to facilitate media presentations and seminar discussions. This grouping procedure was followed during the C.H.S. study.

The social issues class was taught at 9:15 a.m. daily and lasted for forty-five minutes until 10 a.m. The class consisted of 23 students, nine boys and 14 girls ranging in age from 17 to 18 (see Table 5).

The students in the class were divided into three sub-groups using random assignment. The groups were then randomly assigned to treatment. Group One was assigned as the "video" group, Group Two as the "audio" group, and Group Three as the "non-media" group.

The American history class began at 10 a.m. and continued until 10:45 a.m., on a daily basis. This class, which consisted of 21 students 13 boys and eight girls, ranged in age from 16 to 18 (see Table 6). The American history class was also divided into three sub-groups using random assignment, and the groups were randomly assigned to treatment. Each group originally consisted of seven students. One girl came to school one
## Table 5. Number of Social Issues Students, by age and sex, completing the critical thinking study

<table>
<thead>
<tr>
<th>Group</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>4</td>
<td>6</td>
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<td>2/8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Audio</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
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<td>17</td>
<td>4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Non-Media</td>
<td>16</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>17</td>
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<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>2/3</td>
<td>0</td>
<td>2/7</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2</td>
<td>5</td>
<td>7</td>
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<td></td>
<td>9</td>
<td>14</td>
<td>23</td>
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## Table 6. Number of American history students by age and sex completing the critical thinking study

<table>
<thead>
<tr>
<th>Group</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>16</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Audio</td>
<td>16</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
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<td>1</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>1/3</td>
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<td>1/3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>Non-Media</td>
<td>16</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>17</td>
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<tr>
<td>Total</td>
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<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Class Total</td>
<td></td>
<td>13</td>
<td>8</td>
<td>21</td>
</tr>
</tbody>
</table>
week late and was randomly assigned to Group Two. One boy later left Group Three, leaving Group One with seven students, Group Two with eight students, and Group Three with six students.

The three treatment conditions were:

**Video Feedback.** These students were videotaped during their seminar discussions. They then evaluated their critical thinking skills in a subsequent viewing of the videotape using an evaluation sheet which is discussed in more detail later in this paper. This was Treatment Group 1.

**Audio Feedback.** These students were audiotaped during their seminar discussion sessions. They subsequently listened to the audio tape of their discussion and evaluated their discussion using the evaluation sheet mentioned in the description of Category I. This was Treatment Group 2.

**Non-media Feedback.** These students conducted a "normal" seminar session as they have been held at Cedar High School for the past several years. Their sessions were not recorded for evaluation at a later time. They did, however, review their discussion behaviors at the conclusions of each discussion, using the student's evaluation guide provided by Mini-course 14. Copies of those evaluation sheets are in Appendix F. The non-media feedback group was Treatment Group 3 and was considered the control group.

A posttest-only design was used for the study. In discussing this design, Campbell and Stanley (1963, p. 15) stated that "within the limits of confidence stated by the test of significance, randomization can suffice without the pretest." They (Campbell and Stanley, 1963, p. 26) went on to say that "unless there is some question as to the genuine randomness of the assignment, the posttest-only control group design is greatly underused in educational psychological research." Campbell and Stanley (1963, p. 26) also stated that the posttest-only control group design has the advantage of
"avoiding the 'giveaway' repetition of identical or highly similar unusual content (as in attitude change studies)." The posttest-only control group design was also used in the U.S.U. Project (Shaver and Larkins, 1969) after which the C.H.S. study was patterned.

The research design of the C.H.S. study called for three tests to be given in November immediately following the end of the ten-week study. These first posttests were to identify any immediate differences in critical thinking among the treatment groups. The design also called for a second testing approximately 30 days after the conclusion of treatment. This delayed posttest was intended to identify any differences in the retention of critical thinking skills among the treatment groups. The dependent variables were the Watson-Glaser Critical Thinking Appraisal, (W.G.C.T.A.), the Social Issues Analysis Test No. 1 (SIAT No. 1), and the Seminar Discussion Check List (S.D.C.L.) which was designed as an observational system to evaluate oral discussions.

Alternate forms of the W.G.C.T.A. were given in each posttest, SIAT No. 1 had no alternate form, so was administered in both posttests. Each of the three treatment groups in the history and social issues classes also had their discussion sessions recorded on audio tape during the last two of the ten seminars that were held. This provided two tapes from each of the three treatment groups in November. Two additional discussions from each treatment group were also audio taped in December. These tapes were then scored using the Seminar Discussion Check List.
Seminar Discussion Check List

The S. D. C. L. prepared for use in the C. H. S. study, is a modification of a system of discussion analysis developed by Oliver and Shaver (1962, 1970) which was mentioned in the Review of Literature. The Oliver- Shaver system was divided into two general areas, "static categories" and "dynamic categories." The dynamic system has three areas, "conflict consistency . . . specification and generalization . . . and qualifying" (Oliver and Shaver, 1962, p. 61). The dynamic system which required the scorer to "deal with a context beyond the statement being categorized" (Oliver and Shaver, 1962, p. 57), was not used in the C. H. S. study. "Static categories," however, were selected to be used following the suggestion of Oliver and Shaver (1962, p. 61) that their system could "be modified to include fewer categories in order to simplify scoring."

Of the thirteen items listed earlier in the "static category" by Oliver and Shaver (1962), seven items were included in the S. D. C. L. These categories were specifically based on the critical thinking skills that had been identified to be taught during the C. H. S. study.

The categories on the S. D. C. L. and definitions of the categories are:

1. Value Judgement
   Statements in which the speaker expresses a preference for a person, object or position in the argument in terms of a social or legal value, such as personal privacy, freedom of speech or religion, or equal protection of the law.
   "Mr. Kohler certainly should have the right to run his business and to make contracts with his workers without union interference."
2. **Legal Claims**  
Statements in which the speaker asserts that someone has a legal right to do something, such as equal protection under the law, constitutional rights, etc.  
"According to the Constitution, even a murderer has the right to a fair and speedy trial."

3. **Factual Claims**  
Statements describing specific events or making predictive generalizations.  
"The first attempt at integration was at Little Rock on September 4, 1957."
"Negroes are just as intelligent as whites."

4. **Source of Information**  
A statement describing the source on which a claim, a definition, or value judgement is based.  
"My text book states that over 600,000 people lost their lives as a result of the Civil War."

5. **Definitional Claim**  
A statement about how a word or phrase is defined or should be defined.  
"I believe that an emergency occurs when one or more people are in danger of being injured or of losing their lives or property."

6. **Case-Analogy**  
A set of statements which describes real or hypothetical situations analogous to the one under discussion.  
"If your dad was arrested for speeding while on his way to save someone from great harm, would you still feel that everyone who breaks a law should be arrested?"

7. **Clarification Procedural**  
A statement in which the speaker communicates something in order to focus attention, or a statement directed at controlling the immediate situation.  
"Let's take a vote."
"Let's give everyone a chance to talk."
"Get back in your seat and set down."

8. **Challenge**  
Statements challenging the statement of others.  
"I don't think you've proved your point."

9. **Support**  
Statements supporting the statements of other.  
"I agree that the war should never have been started."
An S.D.C.L. score sheet was used by each student to record the number of critical thinking responses he or she made in each of the discussion sessions and the same sheet was used in scoring the posttest discussions (see Appendix E).

**Observer reliability.** In regards to the reliability of the S.D.C.L., it is necessary to begin with the reliability of the original system developed by Oliver and Shaver (1962). Four persons were trained to use this system and inter-observer reliability was estimated using the product-moment correlations. Reliability coefficients ranged from .48 to .95. In regards to the reliability of that system, the authors stated:

As we are not now reporting our system within a specific research context, it seems sufficient to point out that with the exception of one coefficient all approach at least .70, with two greater than .80 and one greater than .90, and that is on the average, a relatively high level of agreement. (Oliver and Shaver, 1962, p. 60)

The "Seminar Discussion Check List" developed for this study is a modification of the "static categories" developed by Oliver and Shaver (1962) which were discussed earlier. No attempt has been made to equate the reliability of the S.D.C.L. and the Oliver-Shaver instrument. The Oliver and Shaver data indicate, however, that in the analysis of oral discussions of public issues, this type of instrument is a reliable measurement tool.

**Training.** As already noted, the S.D.C.L. was used throughout the ten-week study by students to record the numbers of occurrences of the critical thinking skills which the students were to use in their discussion
groups. Students were instructed in the use of the S.D.C.L. in two phases: first, they were shown the demonstration video tape which identified the specific behaviors the S.D.C.L. was designed to record. They then scored a video taped discussion. Because the categories used in the S.D.C.L. do not require fine distinctions, students had little difficulty in coming to agreement about which statements should be scored in which category.

The twenty-four tape recorded discussions made at the conclusion of the study were scored by the writer using the S.D.C.L. to assess the affectiveness of the experimental treatments used in the C.H.S. study. This procedure, while not uncommon, still leaves the results of a study open to question unless there is some evidence that there was no consistent bias or set on the part of the observer which might have influenced the scores obtained.

To resolve this question, a two-phase training program similar to the one used with students was also used to train a second observer who scored a three-tape sample of the twenty-four tapes used to collect data for the study. The second observer was a graduate student at Utah State University who had no previous knowledge of the C.H.S. study. Because of the incompatibility of the VTR equipment at Utah State University with that at C.H.S., it was impossible to use the video tape demonstrating the desired critical thinking skills to train the second observer.

The second observer did, however, read a script of the demonstration tape to become familiar with the critical thinking categories on the S.D.C.L. He then asked the writer some general questions about length of statements to
be scored as one response. He also inquired if it was permissible to stop the tape to play back parts if the discussion was unclear or if he was unable to keep up with the student discussion. Since the tapes were in twenty-minute time blocks to facilitate scoring, the tapes could be stopped and started as often as necessary to clearly understand the recorded statements.

Results. The second observer then listened to the three tapes and recorded the students' responses on the S.D.C.L. The process took about four hours, as the second observer replayed some sections of each tape several times in order to hear students' statements. Table 7 shows the results of correlating the category frequencies obtained by the writer and the graduate student observer.

<table>
<thead>
<tr>
<th>Rater</th>
<th>Total Responses</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigator</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>Graduate Student</td>
<td>124</td>
<td>.9862</td>
</tr>
<tr>
<td>Investigator</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>Graduate Student</td>
<td>115</td>
<td>.9892</td>
</tr>
<tr>
<td>Investigator</td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>Graduate Student</td>
<td>106</td>
<td>.9939</td>
</tr>
</tbody>
</table>
Although these correlations may seem high, it must be remembered that the S.D.C.L. was designed to be used by high school students and that the categories do not require fine discriminations.

It appears that the second observer tended to "underscore" the responses on the tape. A valid explanation for this would seem to be the familiarity of the investigator with the students, and his ability to identify their statements more clearly than the second observer, especially when several students spoke at once.

The difference in observers, however, did not seem to indicate any systematic bias in any particular category and the decision was made to use the scores for the tapes obtained by the investigator as the single scorer.

**Validity.** The validity of the S.D.C.L. was high for the C.H.S. study because the discussion skills identified for this study and the S.D.C.L. both originated with the Oliver-Shaver (1962) curricular framework and research discussed earlier.

The idea of teaching and then evaluating the use of specifically identified critical thinking skills, was a conscious effort to implement the suggestions for teaching critical thinking given by Berlak (1965). His suggestion was:

That educators rely less on the inadequate general models and focus on studying intellectual processes in a given area in order to develop output criteria and models that appear to characterize successful output for that area. From these context specific models and criteria, educators may develop pedagogical strategies and teaching material that are appropriate for that area. (Berlak, 1965, pp. 7-8)
An attempt to develop the S.D.C.L. as a part of a "context specific model" to teach critical thinking meant a strong correspondence between the critical thinking skills taught and the device used to assess these skills. This is the best indication that the "Seminar Discussion Check List" was a valid test for the C.H.S. study.

SIAT No. 1

The second device used to assess student learning was the Social Issues Analysis Test (SIAT No. 1) developed by the Harvard Social Studies Project (Oliver and Shaver, 1966). The purpose of SIAT No. 1 "is to assess how well students can identify selected intellectual operations occurring in an argumentative dialogue." (p. 191)

SIAT No. 1 was originally pretested on groups of Master of Arts in Teaching candidates in social studies education at Harvard to determine whether the conceptual framework upon which it was based was so narrow or was expressed in such technical language that intelligent, well-educated lay people could not be expected to understand it. . . . It seemed fairly clear to us that the language was not overtechnical and the conceptual framework was not idiosyncratic. The source of ambiguity in poor items was easily identified and corrected. It was possible with one or two revisions of specific items to get almost complete agreement among adult judges. The reliability estimate for SIAT No. 1 with a sample of 109 eighth grade students was .81. This is a split-half estimate corrected by the Spearman-Brown formula. (Oliver and Shaver, 1966, pp. 193-194)

The rational equivalence (Kuder Richardson No. 21) reliability coefficients for SIAT No. 1 during the study at C.H.S. were .75 for the November test and .61 for the December test. Although the latter figure is surprisingly low, both are relatively close to the .81 reported by the developers of the test.
Inasmuch as SIAT No. 1 was used twice during the C.H.S. study, it was possible to assess its test-retest reliability. The product-moment correlation between the November and December administrations of SIAT No. 1 was .73 (Table 22) which indicates a rather high test-retest stability.

The SIAT No. 1 was designed to assess "intellectual operations occurring in an argumentative dialogue" (Oliver and Shaver, 1966, p. 191), and it was based on the public issues rationale that underlay the selection of critical thinking skills for the C.H.S. study. It was, therefore, compatible with the objectives of the C.H.S. research. The validity of using any paper and pencil test to assess a student's ability to use discussion skills is, however, open to question. The decision to use SIAT No. 1 was made after a survey of tests indicated that it was the best of the pencil and paper tests available in the area of assessing application of critical thinking skills, and that its use would provide data relevant to the critical thinking skills taught in this study.

**Watson-Glaser Critical Thinking Appraisal**

The third device used to assess the results of the C.H.S. study was the Watson-Glaser Critical Thinking Appraisal developed by Goodwin Watson and Edward Maynard Glaser and published by Harcourt, Brace and World, Incorporated, New York. The test measures five areas of critical thinking:

1. Inference or the ability to discriminate among degrees of truth or falsity;
2. Recognition of assumptions;
3. Deduction or the ability to reason
deductively; (4) Interpretation and the ability to weigh evidence; (5) Evaluation of arguments as to strength and relevancy.

Since their original test was published in 1952, Watson and Glaser have updated their device by adding new questions to bring each of the two forms now available, YM and ZM, up to 100 responses. The test was copyrighted in 1964 and has been standardized by the authors using 10,312 high school students in grades 9-12 at 14 school systems in 13 states (Watson and Glaser, 1964).


The rational equivalence (Kuder Richardson No. 21) reliability coefficients for the study reported by Miller (1970, p. 51) using the Watson–Glaser Critical Thinking Appraisal, however, were considerably below the figures reported by the test publishers for Form YM, .58 and for Form ZM, .74.

The reliability coefficients for the 1972 study at C.H.S., again using the rational equivalence formula (Kuder Richardson No. 21), were for Form YM, .78 and for Form ZM, .86. Both of these figures were considerably closer to the reliability data provided by the test publishers than were the reliability coefficients computed for the 1970 study at C.H.S.
The test-retest reliability of the W.G.C.T.A. was also assessed by computing the product-moment correlation between the November and December administrations of the test. The coefficient was .80 (Table 22), indicating an excellent test-retest reliability for this study.

As for the test's validity, the authors of the test, after reviewing a list of thinking operations put forth by Dressel and Mayhew to which they subscribed, made this statement:

It is the authors' belief that there would be sufficient overlapping among the different lists of component abilities to warrant the expectation that the total score derived from a test based on one list would correlate high with the total score based on an equally good test covering an alternative set of similar abilities. (Dressel and Mayhew, 1954, p. 10)

Watson and Glaser finally concluded that:

The Critical Thinking Appraisal may be used as a research tool to provide objective evidence concerning the development of critical thinking skills as a consequence of a given course of study or teaching method. (Watson and Glaser, 1964, p. 12)

It was realized that the words used by Oliver and Shaver (1962) to describe the thinking operations used in the C.H.S. study were not the same as the terms used by Watson and Glaser in their Critical Thinking Appraisal; however, these differences appeared to be more variations in terminology than conceptual difference.

There were three reasons for using the Watson-Glaser test in the C.H.S. study. First, the test had been used in the two previous studies at C.H.S. (Morris, 1968; Miller, 1970). It was anticipated that a comparison of the data from the 1972 study with data from the two previous studies
would provide meaningful information about the attempts to teach critical thinking at Cedar High School over a period of several years. Secondly, the test is commonly used in education research, so provides a base of information common to other studies. Thirdly, the test has two forms. One of the forms was used at the conclusion of the ten-week study in November and the second approximately 30 days later in December. This was done in an attempt to measure the critical thinking retention rate of the students involved in the study.
CHAPTER IV

ANALYSIS AND FINDINGS

Findings

The data collected from SIAT No. 1 and the Watson-Glaser Critical Thinking Appraisal were analyzed using analysis of covariance as the statistical technique, with students' grade point average as a covariate for the November posttest and with scores from the November posttest as an additional covariate for the December posttest.

Analysis of variance of the grade point averages of the students in each of the treatment groups indicated that there was a significant \((P < .05)\) difference among the mean grade point averages of the groups in the social issues class, although not for the American history class. A Scheffé test indicated that the mean G.P.A. of the audio group was significantly \((P < .05)\) below that of the other treatment groups from the social issues class. The use of covariance as the statistical technique, however, compensated for this initial difference.

A two-way analysis of covariance with treatment and class as factors was performed on the November and December posttest scores with SIAT No. 1 and W.G.C.T.A. as the dependent variables. No significant difference among treatment means was found on either posttest (Tables 8a-11b). However,
Table 8a. Summary of the two-way analysis of covariance for SIAT No. 1, November, 1972, with G. P. A. as the covariate

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M.S.</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>1</td>
<td>.176</td>
<td>.010</td>
<td>N.S.</td>
</tr>
<tr>
<td>Treatments</td>
<td>2</td>
<td>8.380</td>
<td>.514</td>
<td>N.S.</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>3.688</td>
<td>.226</td>
<td>N.S.</td>
</tr>
<tr>
<td>Error</td>
<td>37</td>
<td>16.283</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 8b. Adjusted means and standard deviations, SIAT No. 1, November, 1972

<table>
<thead>
<tr>
<th>Class</th>
<th>Video</th>
<th>Treatment</th>
<th>Non-Media</th>
<th>Class Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
<td>Mean</td>
<td>12.63</td>
<td>10.94</td>
<td>10.32</td>
</tr>
<tr>
<td></td>
<td>S. D.</td>
<td>3.09</td>
<td>4.10</td>
<td>9.91</td>
</tr>
<tr>
<td>American History</td>
<td>Mean</td>
<td>11.62</td>
<td>11.79</td>
<td>10.86</td>
</tr>
<tr>
<td></td>
<td>S. D.</td>
<td>5.28</td>
<td>5.10</td>
<td>5.19</td>
</tr>
<tr>
<td>Means</td>
<td>12.13</td>
<td>11.36</td>
<td>10.59</td>
<td></td>
</tr>
</tbody>
</table>
Table 9a. Summary of the two-way analysis of covariance for W.G.C.T.A. Form YM, November, 1972, with G.P.A. as the covariate

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M.S.</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>1</td>
<td>48.565</td>
<td>.481</td>
<td>N.S.</td>
</tr>
<tr>
<td>Treatments</td>
<td>2</td>
<td>194.539</td>
<td>1.920</td>
<td>N.S.</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>131.346</td>
<td>1.301</td>
<td>N.S.</td>
</tr>
<tr>
<td>Error</td>
<td>37</td>
<td>100.890</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 9b. Adjusted means and standard deviations, W.G.C.T.A. November, 1972

<table>
<thead>
<tr>
<th>Class</th>
<th>Video</th>
<th>Treatment</th>
<th>Non-Media</th>
<th>Class Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
<td>Mean</td>
<td>63.37</td>
<td>61.88</td>
<td>61.81</td>
</tr>
<tr>
<td></td>
<td>S. D.</td>
<td>6.93</td>
<td>11.45</td>
<td>9.59</td>
</tr>
<tr>
<td>American History</td>
<td>Mean</td>
<td>72.37</td>
<td>60.24</td>
<td>60.78</td>
</tr>
<tr>
<td></td>
<td>S. D.</td>
<td>7.37</td>
<td>9.84</td>
<td>15.03</td>
</tr>
<tr>
<td>Means</td>
<td></td>
<td>67.87</td>
<td>61.06</td>
<td>61.29</td>
</tr>
</tbody>
</table>
Table 10a. Summary of the two-way analysis of covariance for SIAT No. 1 December, 1972, with G. P. A. and November test scores as covariates

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M.S.</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>1</td>
<td>3.826</td>
<td>.592</td>
<td>N.S.</td>
</tr>
<tr>
<td>Treatment</td>
<td>2</td>
<td>3.738</td>
<td>.571</td>
<td>N.S.</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>3.186</td>
<td>.492</td>
<td>N.S.</td>
</tr>
<tr>
<td>Error</td>
<td>35</td>
<td>6.467</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 10b. Adjusted means and standard deviations, SIAT No. 1, December, 1972

<table>
<thead>
<tr>
<th>Class</th>
<th>Video</th>
<th>Treatment</th>
<th>Non-Media</th>
<th>Class Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Audio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Issues</td>
<td>12.54</td>
<td>11.35</td>
<td>11.99</td>
<td>11.96</td>
</tr>
<tr>
<td></td>
<td>1.60</td>
<td>4.35</td>
<td>2.45</td>
<td></td>
</tr>
<tr>
<td>American History</td>
<td>10.89</td>
<td>10.82</td>
<td>12.37</td>
<td>11.36</td>
</tr>
<tr>
<td></td>
<td>4.99</td>
<td>4.10</td>
<td>2.68</td>
<td></td>
</tr>
<tr>
<td>Means</td>
<td>11.72</td>
<td>11.08</td>
<td>12.18</td>
<td></td>
</tr>
</tbody>
</table>
Table 11a. Summary of the two-way analysis of covariance for W.G.C.T.A. form ZM, December, 1972, with G.P.A. and November test scores as covariates

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M.S.</th>
<th>F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>1</td>
<td>180.969</td>
<td>4.966</td>
<td>.05*</td>
</tr>
<tr>
<td>Treatments</td>
<td>2</td>
<td>25.246</td>
<td>.693</td>
<td>N.S.</td>
</tr>
<tr>
<td>Interaction</td>
<td>2</td>
<td>56.001</td>
<td>1.530</td>
<td>N.S.</td>
</tr>
<tr>
<td>Error</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the .05 level.


<table>
<thead>
<tr>
<th>Class</th>
<th>Video</th>
<th>Treatment</th>
<th>Non-Media</th>
<th>Class Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Audio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Issues</td>
<td>Mean</td>
<td>60.01</td>
<td>56.82</td>
<td>56.86</td>
</tr>
<tr>
<td></td>
<td>S. D.</td>
<td>9.44</td>
<td>11.57</td>
<td>10.14</td>
</tr>
<tr>
<td>American History</td>
<td>Mean</td>
<td>61.37</td>
<td>59.58</td>
<td>65.70</td>
</tr>
<tr>
<td></td>
<td>S. D.</td>
<td>10.38</td>
<td>8.30</td>
<td>10.45</td>
</tr>
<tr>
<td>Means</td>
<td></td>
<td>60.51</td>
<td>58.51</td>
<td>61.28</td>
</tr>
</tbody>
</table>
class differences (Table 11a) were found on the W.G.C.T.A. for the December posttest.

Next, scores on the S.D.C.L. were analyzed. Because of difficulty in identifying individuals in scoring discussions, group means were used for analysis of the ten dependent variables—the nine categories and the total of acts in all nine categories. Three-way analysis of variance was used with class (social issues and American history), treatment (video, audio, and non-media), and date (November and December) as the three factors. Interactions between class and treatment, class and date, and treatment and date were also tested for significance. The primary purpose of the research was to determine if there were significant difference among the three treatment groups on any of the dependent variables (Tables 12a-20b).

It was hypothesized at the beginning of the study that students in the experimental video discussion groups in the social issues and American history classes would have higher November and December posttest mean critical thinking scores on each of the dependent variables, than would students in the audio and non-media groups. It is apparent from the analysis that instead, in each case the null hypothesis was accepted.

Inspection of the tables for the SIAT No. 1 and the W.G.C.T.A. indicated considerable difference between some pairs of standard deviations. These were checked for significance using the F-ratio for independent variances. F-ratios were found for the November SIAT No. 1 between the video (S.D. 3.09), audio (S.D. 4.10), and the non-media (S.D. 9.91) social issue
Table 12a. Summary of analysis of variance* for Variable One, Value Judgement

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>M.S.</th>
<th>F</th>
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<tbody>
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<tr>
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<td>(14)</td>
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</table>

*As noted in the text a three way analysis of variance was carried out but only the information on the main effects is reported here.

Table 12b. Adjusted means for Variable One, Value Judgement

<table>
<thead>
<tr>
<th>Class</th>
<th>Video</th>
<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
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<td>2.81</td>
<td>3.39</td>
<td>3.10</td>
</tr>
<tr>
<td>American History</td>
<td>3.64</td>
<td>2.19</td>
<td>2.71</td>
<td>2.84</td>
</tr>
<tr>
<td>Means</td>
<td>3.36</td>
<td>2.50</td>
<td>3.05</td>
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</tr>
</tbody>
</table>
Table 13a. Summary of analysis of variance for Variable Two, Legal Claims

<table>
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<tr>
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<th>F</th>
<th>Significance</th>
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</thead>
<tbody>
<tr>
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<tr>
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<td>.023</td>
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<td>N.S.</td>
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<tr>
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<td>2.030</td>
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</table>

Table 13b. Adjusted means for Variable Two, Legal Claims

<table>
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<th>Video</th>
<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
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</thead>
<tbody>
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<td>.00</td>
<td>.07</td>
<td>.02</td>
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<td>American History</td>
<td>.39</td>
<td>.19</td>
<td>.17</td>
<td>.25</td>
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<td>Means</td>
<td>.19</td>
<td>.09</td>
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Table 14a. Summary of analysis of variance for Variable Three, Factual Claims

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<td>.46</td>
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Table 14b. Adjusted means for Variable Three, Factual Claims

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<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
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</thead>
<tbody>
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<td>6.56</td>
<td>6.78</td>
<td>6.56</td>
</tr>
<tr>
<td>American History</td>
<td>12.35</td>
<td>9.72</td>
<td>10.67</td>
<td>10.91</td>
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<tr>
<td>Means</td>
<td>9.35</td>
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<td>8.73</td>
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Table 15a. Summary of analysis of variance for Variable Four, Sources of Information

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</thead>
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<td>.195</td>
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<td>.560</td>
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Table 15b. Adjusted means for Variable Four, Sources of Information

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<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
</tr>
</thead>
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<td>.78</td>
<td>.68</td>
<td>.72</td>
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<tr>
<td>American History</td>
<td>.89</td>
<td>.53</td>
<td>.53</td>
<td>.65</td>
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<td>Means</td>
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<td>.60</td>
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Table 16a. Summary of analysis of variance for Variable Five, Definitional Claims

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<th>Significance</th>
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<td>Date</td>
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<td>.003</td>
<td>.010</td>
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Table 16b. Adjusted means for Variable Five, Definitional Claims

<table>
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<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
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<td>.00</td>
<td>.00</td>
<td>.14</td>
<td>.05</td>
</tr>
<tr>
<td>American History</td>
<td>.10</td>
<td>.03</td>
<td>.17</td>
<td>.10</td>
</tr>
<tr>
<td>Means</td>
<td>.05</td>
<td>.02</td>
<td>.15</td>
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Table 17a. Summary of analysis of variance for Variable Six, Case-Analogy

<table>
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<td>.030</td>
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<tr>
<td>Treatment</td>
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<td>.040</td>
<td>.050</td>
<td>N.S.</td>
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<tr>
<td>Date</td>
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<td>.125</td>
<td>.163</td>
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<tr>
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<td>(14)</td>
<td>.766</td>
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</tr>
</tbody>
</table>

Table 17b. Adjusted means for Variable Six, Case-Analogy

<table>
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<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
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<tbody>
<tr>
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<td>1.28</td>
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</tr>
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<td>American History</td>
<td>1.15</td>
<td>1.28</td>
<td>1.54</td>
<td>1.32</td>
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<tr>
<td>Means</td>
<td>1.37</td>
<td>1.28</td>
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Table 18a. Summary of analysis of variance for Variable Seven, Clarification—procedural

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<th>Significance</th>
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</thead>
<tbody>
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<td>Treatment</td>
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<td>3.067</td>
<td>799</td>
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</table>

Table 18b. Adjusted means for Variable Seven, Clarification—Procedural

<table>
<thead>
<tr>
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<th>Video</th>
<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
<td>.37</td>
<td>.65</td>
<td>.46</td>
<td>.50</td>
</tr>
<tr>
<td>American History</td>
<td>.57</td>
<td>.81</td>
<td>1.66</td>
<td>1.01</td>
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<tr>
<td>Means</td>
<td>.47</td>
<td>.73</td>
<td>1.06</td>
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</table>
Table 19a. Summary of analysis of variance for Variable Eight, Challenge

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<td>Treatment</td>
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<td>.000</td>
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<tr>
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Table 19b. Adjusted means for Variable Eight, Challenge

<table>
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<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
<td>2.44</td>
<td>3.37</td>
<td>2.99</td>
<td>2.94</td>
</tr>
<tr>
<td>American History</td>
<td>2.42</td>
<td>4.09</td>
<td>5.16</td>
<td>3.89</td>
</tr>
<tr>
<td>Means</td>
<td>2.43</td>
<td>3.73</td>
<td>4.08</td>
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</table>
Table 20a. Summary of analysis of variance for Variable Nine, Support

<table>
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<th>F</th>
<th>Significance</th>
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</thead>
<tbody>
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<td>4.270</td>
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<tr>
<td>Treatment</td>
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<td>.247</td>
<td>1.488</td>
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<tr>
<td>Date</td>
<td>1</td>
<td>.774</td>
<td>4.650</td>
<td>.05</td>
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<tr>
<td>(Error)</td>
<td>(14)</td>
<td>.166</td>
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<td></td>
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</table>

Table 20b. Adjusted means for Variable Nine, Support

<table>
<thead>
<tr>
<th>Class</th>
<th>Video</th>
<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
<td>.94</td>
<td>.65</td>
<td>.96</td>
<td>.85</td>
</tr>
<tr>
<td>American History</td>
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<td>1.00</td>
<td>1.37</td>
<td>1.19</td>
</tr>
<tr>
<td>Means</td>
<td>1.07</td>
<td>.83</td>
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</table>
Table 21a. Summary of analysis of variance for Total Valued Acts

<table>
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<th>M.S.</th>
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<th>Significance</th>
</tr>
</thead>
<tbody>
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<td>234.125</td>
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<td>Treatment</td>
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<td>12.422</td>
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<td>N.S.</td>
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<tr>
<td>Date</td>
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<td>7.504</td>
<td>.486</td>
<td>N.S.</td>
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<td>(Error)</td>
<td>14</td>
<td>15.439</td>
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</tbody>
</table>

Table 21b. Adjusted means for Total Valued Acts

<table>
<thead>
<tr>
<th>Class</th>
<th>Video</th>
<th>Audio</th>
<th>Non-Media</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Issues</td>
<td>15.50</td>
<td>16.12</td>
<td>16.78</td>
<td>16.14</td>
</tr>
<tr>
<td>American History</td>
<td>23.14</td>
<td>19.84</td>
<td>24.16</td>
<td>22.38</td>
</tr>
<tr>
<td>Means</td>
<td>19.32</td>
<td>17.98</td>
<td>20.47</td>
<td></td>
</tr>
</tbody>
</table>
groups (Table 8b; $P < .01$); the video (S.D., 7.37) and non-media (S.D. 15.03) American history groups on the November W.G.C.T.A. (Table 9b; $P < .05$); the video (S.D. 6.93) social issues group and the non-media (S.D., 15.03) American history group on the November W.G.C.T.A. (Table 9b; $P < .05$); the video (S.D. 1.60) and the audio (S.D. 4.35) social issues class on the December SIAT No. 1 (Table 10b; $P < .01$); and between the social issues video (S.D. 1.60) group and the American history video (S.D. 4.99) group on the December SIAT No. 1 (Table 10b; $P < .01$). These findings had no consistent pattern and no conclusions concerning the three treatments used in the C.H.S. study could be drawn.

Additional information was also produced from product-moment correlations among G.P.A., SIAT No. 1, and W.G.C.T.A. (Table 22). All correlations were significant at the .05 level, with the correlations between SIAT No. 1 and W.G.C.T.A. being significant at the .01 level. As was mentioned earlier, the test-retest reliability of SIAT No. 1 and W.G.C.T.A. using the product-moment correlations as indicators was .73 and .80 respectively.
Table 22. Product-moment correlations for G.P.A., SIAT No. 1, and W.G.C.T.A.

<table>
<thead>
<tr>
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<th>November</th>
<th>December</th>
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<th></th>
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<tbody>
<tr>
<td>G.P.A.</td>
<td>.37*</td>
<td>.33*</td>
<td>.31*</td>
<td>.34*</td>
</tr>
<tr>
<td>Nov.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIAT No. 1</td>
<td></td>
<td>.66**</td>
<td>.73**</td>
<td>.64**</td>
</tr>
<tr>
<td>Nov.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>W.G.C.T.A.</td>
<td></td>
<td>.51**</td>
<td>.80**</td>
<td></td>
</tr>
<tr>
<td>Dec.</td>
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<tr>
<td>SIAT No. 1</td>
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<td>.53**</td>
</tr>
<tr>
<td>Dec.</td>
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<tr>
<td>W.G.C.T.A.</td>
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<td></td>
<td></td>
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</tbody>
</table>

*Significant at the .05 level (.304).
**Significant at the .01 level (.393).
CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The main objective of the 1972 study at C.H.S. was to develop a curriculum for teaching critical thinking through the use of selected materials and seminar discussions. A secondary objective was to compare the effectiveness of teaching critical thinking through student self-analysis of video taped replays of seminar discussions, audio taped replays of discussions, and discussions which were not recorded.

There were available two guides for curriculum development that provided the models for the curriculum development phase of this study. The first was the three-step guide for teaching critical thinking suggested by Shaver (1962). His suggestion was to first, identify the specific critical thinking skills to be taught; second, to teach the skills to students and; third, to provide students with realistic situations in which the critical thinking skills could be practiced.

The second was the minicourse technique designed by Borg et al. (1970), to teach a variety of skills to teachers. The suggestion given by Borg was first, to provide a visual model of the skill being taught; second, to provide for the opportunity to practice the skill; and third, to provide the learner with feedback on his practice to help him bring his performance close to the model.
An important aspect of the curriculum objective was to develop a video tape based on the minicourse model to provide examples of the nine critical thinking skills identified for use in the 1972 study at C. H. S. An additional aspect of the curriculum development objective was to prepare an observational system that could be used by students to evaluate their own use of critical thinking skills in seminar discussions.

Students from two social studies classes (social issues and American history) at Cedar High School in Cedar City, Utah, were randomly assigned to three treatment classifications for the study. The "video" treatment group was recorded on video tape while conducting their seminar discussions. After each discussion the students viewed the video tape and recorded on the Seminar Discussion Check List their use of the nine critical thinking skills during the seminar discussion. The "audio" treatment group followed the same procedures used by the video group, except that their discussions were recorded on audio tape. The "non-media" treatment group was not recorded for later student self-evaluation. This group served as the "control group" for the C. H. S. study.

The first research objective of the study was to investigate the effect, in terms of critical thinking, of combining the teaching of critical thinking, using the minicourse method, with the study of social issues. The second research objective was to investigate the effect, in terms of critical thinking of combining the teaching of critical thinking, using the minicourse method, with a study of American history. The third research objective
was to investigate the effect in terms of critical thinking, that a thirty-day non-instruction period would have on the retention rate of critical thinking skills among video, audio, and non-media discussion groups.

These research objectives were evaluated using a posttest-only control group design (Campbell and Stanley, 1963, p. 24), with the first posttest being given in November, 1972, and the second posttest being given in December, 1972.

The dependent variables were the SIAT No. 1 (Social Issues Analysis Test No. 1), the W.G.C.T.A. (Watson-Glaser Critical Thinking Appraisal), and the S.D.C.L. (Seminar Discussion Check List). It was hypothesized that the video discussion groups, in both the social issues and American history classes, would have higher posttest mean critical thinking scores on all three dependent variables, than would students in the audio and the non-media discussion groups.

The hypotheses were tested using two-way analysis of covariance (class by treatment) as the statistical technique for SIAT No. 1 and the W.G.C.T.A. Overall grade point average was used as a covariate for the November posttests, and scores from the November posttest were added as an additional covariate for the analysis of the second posttests.

Three-way analysis of variance was used to analyze the data collected from the S.D.C.L. The main effects tested by this analysis were date (November or December), treatment (video, audio, or non-media), and class (special issues or American history). Because of the difficulty in identifying individuals on the tapes used to score the S.D.C.L., group means were used
for the analysis of the ten dependent variables—nine categories and the total of valued acts.

The two-way analysis of covariance with treatment and class as factors performed on the November and December posttest scores with SIAT No. 1 and W.G.C.T.A. as the dependent variables yielded no significant differences among treatment means. The three-way analysis of variance on S.D.C.L. group means also yielded no significant differences among the three treatment groups. The null hypothesis was accepted for each of the hypothesis stated for the C.H.S. Study.

There are several plausible explanations of the failure to find significant differences among the means of the video, audio, and non-media groups. The first and most obvious is that feedback in the form of video or audio tapes does not provide sufficient information or motivation to change behavior. This explanation, however, contradicts much available information to the contrary. Several of the studies cited in the review of literature, for example, produced evidence that video taped feedback can be an effective means of bringing about behavior change.

A second possibility is that a ten-week study did not produce a sustained enough impact to produce discernable treatment differences. Another possibility is that the instruments used were not valid measures of the skills being taught. The S.D.C.L., for example, because of the gross nature of the categories used, may well have failed to identify significant differences in discussion behavior, which a more discriminating observation system might
have recorded. This problem is a difficult one for the curriculum designer who wants an observation system simple enough for students to use, but also sophisticated enough for use as a tool to collect research data. There is a possibility that these two objectives are incompatible.

Another problem with an observation system like S. D. C. L. is that no weight is given to the perceptiveness of the statements made by students, or to the contribution of such statements toward resolving or clarifying the issues being discussed.

One more possible explanation for the lack of significant differences between treatments is that the instruction in critical thinking that all groups had in common may have minimized the effects which the differing discussion treatments could have. All students had instruction in critical thinking based on the Taking a Stand booklet (Oliver and Newman, 1967) and the Mini-course 14 tapes. All students then had the nine specific critical thinking skills used in the C. H. S. study identified for them on the demonstration tape. This general instruction may well have taught critical thinking to the extent that the feedback provided by the taping session could not add significantly to those skills already learned, or that the various types of feedback added equally well.

This possibility is supported by a comparison of means on the W. G. C. T. A. obtained at C. H. S. over a period of several years (Table 23). The means on the W. G. C. T. A. of all experimental and control groups in the 1972 study at C. H. S., for the November and December tests were combined to give a more complete summary of the critical thinking skills learned
by students. The pooled mean was 63.44. This is considerably above the five-year average of 59.02 during the years 1963-68, which was reported by Morris (1968), although slightly below the average of 64.90 reported by Miller (1970).


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This comparison of means, while of general interest, was not statistically significant at the .05 level. The fact is that the experimental media treatment failed to produce significant differences in critical thinking scores on any of the dependent variables. The main objective of this study, which was to develop a curriculum for teaching critical thinking through the use of video taped seminar discussions, was not a statistically significant success. The educational significance of the study is more difficult to assess.
The video tape demonstrating the critical thinking skills taught in the C. H. S. study may be of interest to other social studies educators interested in producing tapes of this type. The development of an observational system for student use may also be of interest to educators who desire to involve their students in this aspect of the educational process.

The combining of the Shaver (1962) model for teaching critical thinking with the procedures outlined in the minicourse model for teacher education may also have provided some information to social studies educators. With no data to suggest the relative worth of the curriculum items developed for this study, the educational significance of each must be open to question.

**Research Recommendations**

At the conclusion of the study at C. H. S. in December of 1972, there were still approximately three weeks remaining in the first semester of the school year. Because of the nature of the treatments used during the study, prior to this time the audio and discussion groups had not seen themselves on video tape. The students in these groups had asked to observe on video tape their use of the critical thinking skills which the video group had been practicing. The decision was made by the teachers who had assisted the writer with the study to use this three-week period to "rotate" the audio and discussion groups through discussion sessions during which they would be recorded on video tape. As a result, each student in the study was able to participate at least once in all three of the discussion procedures used in the ten-week study.
On the last day of the semester, the students who had participated in the study were asked to fill out a "Student Evaluation Form" to obtain their reaction to the study. A copy of the entire questionnaire is included in the Appendix. The students' responses to the first and fifth questions, however, are of interest.

The first question was, "What is your general reaction to the class you are completing?" The fifth question was, "What is your reaction to the recording and scoring procedures that have been used? State which method you think has been most helpful in helping you learn critical thinking discussion skills."

The twenty-three students present in the social issues class the day the questionnaire was handed out were all positive in their reactions to the discussion procedures used in the study. Twenty liked the video tapes sessions best, and one student, who said he was afraid of recorders, indicated a preference for the discussion group. Twenty-one students were present in the American history class to respond to the questionnaire. All twenty-one felt the course had been rewarding for them. Sixteen liked the video taped discussions best, one liked the discussion sessions best and the other four stated "no preference."

Based on positive student and faculty response toward the study at C.H.S., along with favorable response from state educational personnel and the patrons of C.H.S. generally, the teaching of critical thinking skills through the procedures described in this report will be continued at C.H.S. Nevertheless, adequate data on the student interest produced by the study
were not collected. Student interest in learning the skills of critical thinking appeared obvious in the previous study (Miller, 1970) at C.H.S., and as the responses on the student questionnaire indicate, appeared to be present during the 1972 study. This interest in critical thinking may be a "cosmetic" or hawthorne effect brought about by the activities of the researcher and may not be long lasting or sustainable with extensive treatment—possibilities worth further investigation.

Other questions about the discussions' impacts in the affective domain remain unanswered: Were there differences among the treatments? Was the interest shown by students generated by the recording or discussion procedures or by the discussion topics? Was the interest in discussion that was demonstrated in the classroom carried over into community activities? These kinds of questions would be of interest to a person replicating the C.H.S. study, and suggest the need for explicit attention to affective outcomes.

Several other questions were raised during the study which may be of sufficient interest to warrant further investigation. The personality styles of students as related to their willingness to be videotaped was not investigated. Outgoing verbal students, for example, may react much differently to video feedback than would students with more reserved personalities. Dependent variables for assessing reactions to discussions are not plentiful, thus opening another area for the researcher interested in the effective domain.

Another area worth investigating is the "feedback" portion of the minicourse model which requires the use of video tape playbacks of the
student's performance. The results of this study seemed to indicate that there was no difference in the use of the critical thinking skills taught during the study among those students who received video feedback, those who received feedback from audio recordings, and those who received no feedback except from their analysis using the Mimicourse 14 check sheets. Research (Gall et al., 1971) which was not available until after this study was completed also indicated that audio feedback was as effective as video feedback in bringing student behavior into correspondence with the "model" behavior demonstrated on video tape. The possibility that varying types of feedback are equally effective is important to educators who would like to use the minicourse model of education, but who lack video tape resources.

The use of a self-evaluation-observation system, such as the S.D.C.L., by students also raised some potentially significant research questions. As was mentioned earlier, an observational system that has categories general enough to permit students to perform a self-analysis is probably not specific enough to collect research data. Perhaps a future study could replicate the procedures followed in the 1972 C.H.S. study, but use as the instrument to collect research data, a more discriminating instrument. Such a system, in the hands of a trained observer, might identify significant differences in critical thinking skills which could not be assessed with the S.D.C.L.

The Shaver (1962) model for teaching critical thinking is itself an excellent starting point for future research. The model requires the teacher or curriculum designer identify the critical thinking skills he wishes to teach, and then to teach these skills to students. The procedures, methods,
and materials that could be used to teach critical thinking are as numerous as the innovative research wishes them to be. While the use of the mini-course method of teaching critical thinking was not statistically successful in the C. H. S. study, the Shaver (1962) model can be recommended to other researchers and curriculum designers as an excellent starting point for future attempts to teach critical thinking.


Appendix A:

Minicourse 14 Outline
OUTLINE OF COURSE SKILLS FOR TEACHERS AND STUDENTS

Course Objective: Develop skills for discussing controversial issues effectively.

MODERATORS

Lesson 1
Objective: Have an open discussion in which people feel free to say what they think.

1. Support every person's right to his own opinion.
2. Use supportive silence to promote group interaction.
3. Distribute participation by calling on silent group members.

PARTICIPANTS

1. Talk to each other, not just the moderator.
2. Don't monopolize.
3. Ask others what they think.
4. Don't engage in personal attack.

Lesson 2
Objective: Listen to others and keep the discussion focused.

1. State the issue at the beginning of the discussion.
2. Restate the issue to keep the discussion focused.
3. Summarize statement made by participants.

1. Listen to others' ideas.
2. Acknowledge others' ideas.
3. Question irrelevant remarks.

Lesson 3
Objective: Analyze different points of view.

1. State areas of agreement or disagreement.
2. Ask for temporary agreement to break up deadlocks.
3. Ask for clarification.
4. Ask for reasons why someone holds a particular viewpoint.

1. Ask for clarification.
2. Ask for reasons for others' opinions.
3. Give reasons for your opinions.

Lesson 4
Objective: Evaluate the effectiveness of a discussion.

1. Ask for a brief review.

1. Review the main points of the
2. Ask participants to explain viewpoints different from their own.
3. Ask participants to tell their current opinion and how the discussion affected it.
4. Ask about the next step for the group, or individuals.

2. Explain viewpoints different from yours.
3. Tell your current opinion and how the discussion affected it.
4. Suggest the next step for the group, or for your personally.
Appendix B:

Video Tape Script
TEACHING CRITICAL THINKING THROUGH STUDENT SELF ANALYSIS
OF VIDEO TAPE SEMINAR SESSIONS

NARR.: The tape you are about to see will demonstrate several kinds of discussion techniques that are helpful to those engaged in the resolution of value conflicts. These techniques, when used consistently by a person involved in this type of discussion will aid that person to more rationally approach the problems we all face in our daily lives. A person who uses these skills, known as critical thinking skills, is better able to make important decisions in the social-political world we all share. Such decisions as support or opposition for the death penalty, abortion, war or peace, or simply whom to vote for in the next election, are all examples of controversial issues that are common to everyone, but which must be resolved by each person individually before he can state his position to others.

There are many kinds of behavior that can be called critical thinking behavior, and each of these behaviors can be interpreted differently by those who see them. This tape, however, will identify and give examples of nine specific kinds of behavior that have been identified as critical thinking for the course of study you are now beginning.

As the course continues you will be given several opportunities to use these skills in discussion sessions which will be recorded, and which you will have the opportunity to evaluate as to how effectively you have participated in the discussion.

Begin tape by showing two students in a discussion situation.
______: Captain Vere is so dogmatic. He doesn't even want to give Billy a chance.

______: The real problem is making the distinction between what is morally right and what is legally right.

______: I really don't like sea stories anyway. They're always so rough and bloody.

______: Obviously Billy had no legal right to hit Claggart. But what other way was there to defend himself: He couldn't talk.

______: I saw a movie on television Sunday night something like "The Mutiny Act." The good guy got killed because some cruel captain wanted revenge.

You have just observed three students in a discussion in which each student is giving an opinion or stating a position without taking notice of what the other person is saying. Here are the same students discussing the same issue, but this time the dialogue is taking place using the skills of critical thinking.

______: Captain Vere is so dogmatic. He doesn't even want to give Billy a chance.

______: I don't think the problem is so much in the type of man Vere is, but rather the legal bind in which he is caught.

______: I don't see what difference either position makes: _______ sees the problem as a flaw in the character of Captain Vere. _______ sees the problem as a poor sea captain caught in an unjust legal system. As far as I am concerned the results are the same: An innocent man is hanged.
______: But it does make a difference, because the central problem is to find out whether Captain Vere did the right thing.

______: I agree, and I don't see how you can blame the system when the young officers offered a number of possibilities for saving Budd's life, which the captain all but ignored.

______: I see what you people are saying now. You agree with me that a wrong was committed in hanging Billy. Our problem now is to find out where to put the blame. We can blame Vere or we can blame circumstances that are beyond Vere's control.

NARR: In this discussion ______ opened her remarks by stating her position. This statement of position, or belief, or a term we will be using often from now on, value judgement, in which a person expresses a preference for a person, object or position in the argument in terms of a social or legal value such as privacy, freedom of speech or religion or the general welfare of the group, is step one of the critical thinking process.

Here we see ______ clearly state her position on the subject under consideration:

______: Captain Vere really had no choice; the Mutiny Act stated that striking an officer in wartime was a capital offense.

______: The Captain could have disobeyed the law. He did have that choice.

______: But why should the Captain stick his neck out? Why should he do what he knew was wrong, and suffer possible punishment for that later?

______: But it wasn't wrong to save Billy's life. The law itself was wrong.
_____ : You mean obeying the law is wrong?

_____ : Sure, when your conscience tells you that there is a higher moral law being violated. The Nazis were obeying the law when they executed innocent civilians in concentration camps. Obeying that law was not right.

_____ : Well, suppose my conscience tells me that it is wrong to come to school and be brainwashed by English and social studies teachers. Is it OK for me to defy the school attendance laws and stay home?

_____ : But that's different. You're not being brainwashed. You're being educated to know more about the world around you.

_____ : I think you're right, but my example points up the issue we're discussing pretty clearly: When is it reasonable or justifiable to obey one's conscience when it means disobeying the law? To answer this question we've got to explore a number of situations and ask about each: What is there about this situation that makes conscience more important than law, or law more important than conscience?

NARR.: Once you have stated your position concerning the issue being discussed, you then have the responsibility to use the proof process to validate and clarify your position. One of the best ways to do this is to support your argument through the use of legal claims.

_____ : But isn't hanging harsh for simply striking a man?

_____ : That was the law.

_____ : Then the law was much too harsh.

_____ : There must have been a darned good reason for making it so harsh,
and I guess the reason was that the sailors were such an undisciplined rowdy lot.

______: You're always blaming the sailors. Don't forget that many of these sailors were dragged off the streets of London against their will. They were actually kidnapped and forced to serve.

______: So what? That's not much difference from our draft today. We force people to serve, but we expect them to obey officers.

______: But an officer like Vere is so unreasonable. Why didn't he just have Billy flogged? He really didn't have to hang him.

______: That was his legal obligation. He had no choice.

NARR: Another important skill used by the critical thinker is making sure we have all of the facts of the issue in mind, before we try to resolve the conflicts these facts illustrate.

______: I think that we must agree on the facts of this situation before we can resolve the moral or legal question of Billy's death. I think we need to know the reasons for the fear of mutiny aboard the Indomitable; I think we need to know how Billy Budd came to be aboard the ship, and why he was promoted to captain of the foretop. It would also help to know the facts surrounding the disagreement between Billy and Claggart.

______: I think ______ is right. If we can determine these facts I think we can reach a much more realistic position concerning the execution of Billy Budd.

NARR: A person in a discussion who can cite the facts surrounding the issue
being discussed will be in a much better position to defend his position, than the person who can cite no facts to validate his argument.

Along with the use of factual claims in a discussion, the critical thinker must also be able to cite the source of the facts he had presented.

_____ : The funny thing about the John Brown case is that most of his followers and sympathizers were white. Probably the Negroes really didn't want their freedom that badly.

_____ : That's not true. There were lots of Negroes actually fighting with John Brown at Harpers Ferry.

_____ : According to my history text there were only 18 men with him at Harpers Ferry anyway. How many of them were Negroes?

_____ : Most of them were weren't they?

_____ : The encyclopedia says that only five of Brown's raiders were Negroes.

_____ : OK. Maybe that's true about the men in the raid. But there were lots of Negro sympathizers all through the South.

_____ : Why do you say that?

_____ : In my book it says there were three other major attempts to free the slaves. Things were so tense that the Southern whites were afraid even to teach slaves to read and write, or to hold religious meetings without a white man present. With these precautions, there must have been a lot of sympathy for what Brown was trying to do among the Negroes.

****: But you're overlooking the letter from the colored women of Brooklyn we saw in the film.

****: You're right about that. We seem to have some evidence to support each point of view.

****: Why don't we agree to look up some more material on this issue?

****: Now what exactly is the issue?

****: I guess it's whether or not there was a lot of Negro sympathy for what John Brown was trying to do, or whether his support came mainly from Northern whites.

NARR.: It is important to note that both students found sources of evidence to support their point of view. You must be willing to check out the facts in a wide variety of sources, remembering that factual claims are often in conflict, and that one of the most difficult problems facing the critical thinker is the resolution of conflicting sources of information.

A problem that is similar to resolving differences in factual claims and conflicting sources of information is that of agreeing how a word or phrase is defined or should be defined. Everyone has been involved in discussions where the entire issue centered about the definition of a word or phrase.

Here is one example of how to resolve differences over a definitional claim.

****: The charge of treason against John Brown was very unfair. Perhaps he did violate some law, like inciting violence, but the idea that it was treason is simply too harsh.

****: Of course it was treason. He was trying to overthrow the government of Virginia.
______: John Brown says right in the case that he had no intention of committing treason. He simply wanted to free the slaves.

______: It makes no difference whether it was intentional or not. If the result is the same, it's treason.

______: But Brown just wanted to get rid of slavery. He didn't really want to overthrow the whole government.

______: I think he wanted to start a new type of society, and that he did want to overthrow the government of Virginia. The real problem is whether or not he committed treason, and that hinges on how we use the word.

______: Let's agree on how we're using the word "treason," before we argue the facts of the case.

______: OK. Let's say that treason means committing an act with the knowledge that it may very well cause the government to be destroyed.

______: That's fine, and I say that John Brown had no such knowledge.

NARR.: In the example just shown both parties in the discussion stipulated or agreed on the meaning of a word. You may also want to rely on an authority you can both agree on or perhaps use some other techniques we will be discussing later.

Another skill the critical thinker often uses to prove or to clarify his position in a discussion is the use of an analogy. An analogy is a set of statements which describes real or imagined situations similar to the one under discussion.
It was right for Captain Vere to hang Billy because he had to obey the law. He had no choice.

What if your kid sister were seriously injured, and your father was arrested for speeding while he was taking her to the hospital. Do you think he should be convicted and fined?

No.

Then you're allowing your father to break the law.

Of course, but that's different. My father was trying to save my sister's life.

Billy Budd was trying to save his own integrity and honor. Perhaps for him that was worth striking an officer—breaking the law.

I guess in my father's case I think the value of my sister's life is more important than the value of my father's obeying the law. But I think obeying the law on the ship is more important than the value of Billy Budd's keeping his honor or integrity.

The use of an analogy forces the person to do two things. First, to see that there are at least two competing values involved, and second, it forces him to show why he may uphold a value in one situation and yet reject that value in a similar situation.

During a discussion it is almost inevitable to turn away from the facts of a case and to start to wander from the objectives of the discussion. When this happens it becomes necessary for someone to exert some control over the group or to give it some direction. This becomes necessary if the discussion
is to proceed toward the resolution of the conflict being discussed.

_______: Say, ________, what do you think of that law Congress passed about burning draft cards?

_______: It's a good law. Those guys really bug me. Just a bunch of beatniks trying to dodge the draft. They ought to be in jail.

_______: I don't think it's a good law. How are you going to enforce it fairly? Suppose somebody tears up his draft card by mistake?

_______: Who'd do that?

_______: It's a stupid law. What harm does it do to burn a draft card? Besides, look what they did to David Jones. He's a sincere, clean-cut kid, but they put him in jail.

_______: Well, he's not so bad, but some of those other guys... Besides they are encouraging others to buck the draft... It's unpatriotic.

_______: It's not unpatriotic if you believe that the war is a violation of American principles.

_______: You mean the war in Vietnam?

_______: Yes, we're killing a lot of people and using gas and napalm and all that just to support an unpopular dictatorship. That's against our principles.

_______: Well, it's also against our principles to let the Communists take over.

_______: The Viet Cong aren't just Communists. There are a lot of other people in their movement too. It's the government that calls them all Communists. They say they are nationalists.
I think you two have missed the point entirely. You started your conversation talking about the law concerning draft card burning then you argued about the war in Viet Nam and now you are arguing about the definition of a Communist. I think you would be better off if you followed a few of the rules of problem solving, the first one being to clearly state the issue you're talking about.

NARR.: In this situation a third person felt it was necessary to control the procedures of the group and to direct those in the discussion back to the main idea of the discussion. Often this control will come from the group leader, but it is a better idea if everyone in the group feels responsible for the success of the group's discussion.

Another responsibility a person seeking to develop his critical thinking ability has is to challenge, in a thoughtful way, those positions in the argument he disagrees with.

Well, even though you feel sorry for Budd, I guess he got what he deserved.

How can you say that? He was innocent.

He was involved in the mutiny. And Claggart had good reason to believe that he might side with the men if violence actually broke out.

All the evidence indicates that Billy was perfectly loyal to the captain. What about the end of the case when he said "God Bless Captain Vere?"

It wasn't Vere's fault that Billy was too stupid to see that he was committing a crime. Billy was dangerous without even knowing it. Maybe he
couldn't stop himself from hitting Claggart. That doesn't mean that Bill Budd
wasn't a dangerous man.

_______: I'm a little confused now. Are you saying that Budd was punished
because he was guilty of a crime or because he was dangerous and stupid?

_______: I'm saying that all the men on the ship were dangerous. They were
a bunch of mutinous pirates, and the officers had good reason to be careful
and treat the crew members harshly.

NARR.: In this discussion the challenge to a statement and the response to
the challenge led to a clarification of the positions of those in the group. Un-
less each person is willing to thoughtfully question and challenge the positions
of others, the resolution of the conflict under discussion will never occur.

Often times during a discussion another person will take a position
that is similar to your position or idea. In such instances it is important
for you to indicate your support, as this will help others to better understand
your position on the issue being discussed. The support you give can be non-
verbal such as nodding your head, or it may be verbal as in this example.

_______: Vere's idea of the law was hard and fast. He really could have
shown a little mercy.

_______: I think Vere had in mind not only that the Mutiny Act was a very
rigid law, but also that the purpose behind it was based on experience.

_______: But the purpose really could not have been to punish people like
Billy.

_______: Not exactly, but the purpose was to show that the law would deal
harshly and impartially with any act of disobedience.
You're saying that the major reason for hanging Billy was not to punish him, but to set an example for the other men.

That's right.

I think there's a real question of the results even if the act is used that way. Maybe the men will see how unjust the act is and have even less respect for the officers of the ship. It might breed mutiny instead of controlling it.

I see what you're driving at. At least we can see why Vere though he had to do what he did, even though it right not turn out the way he wanted it to.

NARR.: In this example you see two people that are using their agreement on an issue as a starting point to clarify and resolve the issue before them. The resolution of controversial issues is dependent upon the support of others, as well as the question of others. The resolution of value conflict is never easy to achieve, and sometimes it is impossible to achieve.

Perhaps the only agreement that will come from the discussion of public issues, is the agreement to disagree. Even in these cases the participants in the discussion should have achieved deeper insights into opposing points of view and should have had the opportunity to express their own views clearly and effectively.
Appendix C:

Discussion Topics and Schedule of Presentations

for the Social Issues Class
Discussion Topic No. 1 8-14 Sept. 1972
Communication and Freedom

Discussion Topic No. 2 15-21 Sept. 1972
Freedom, Responsibility and the Draft

Discussion Topic No. 3 22-27 Sept. 1972
Drugs and the Youth Culture

Discussion Topic No. 4 28 Sept. – 5 Oct. 1972
The Exercise of Authority

Discussion Topic No. 5 6-12 Oct. 1972
The Constitution and Human Rights

Discussion Topic No. 6 13-19 Oct. 1972
Freedom and Extremist Groups

Discussion Topic No. 7 20-26 Oct. 1972
Elections and the Transfer of Power

Discussion Topic No. 8 27 Oct. – 2 Nov. 1972
Minority Groups

Discussion Topic No. 9 3-9 Nov. 1972
Family Planning
Discussion Topic No. 10
Poverty

10-15 Nov. 1972

Discussion Topic No. 11
Women's Liberation

1-7 Dec. 1972

Discussion Topic No. 12
Violence and War

8-15 Dec. 1972
Appendix D:

Discussion Topics and Schedule of Presentations

for the American History Class
Discussion Topic No. 1  8-14 Sept. 1972

Compare the values of the European colonizer with those values of the Native American.

A. Why did these value systems come into conflict?

B. In your opinion, could this conflict have been avoided?

Discussion Topic No. 2  15-21 Sept. 1972

The contributions of Puritan society has been a highly controversial subject in American history. The traditional view of the Puritan is one of a sour personality, strict moral code, witch hunting, and unreasonably religious. That description is now being challenged.

A. Can we agree as to a characterization of these people and their society?

B. How did the influence and power of the Puritan theocracy ebb during the first 60 years of settlement at Massachusetts Bay?

C. What economic philosophy did the Puritans hold? Did this conflict with the religious philosophy of these people?

D. Evaluate the Puritan contributions to subsequent American culture.

E. Evaluate Roger Williams.

Discussion Topic No. 3  22-27 Sept. 1972

The word "rebellion" has been a popular word with young people during the past few years. Compare the rebellion represented in the American Revolutionary movement with the so called "youth rebellion" of today. Compare values, notives, means, objectives and desired end results.

A. Is violence an acceptable method of bringing about change?

B. How effective is a non-violent approach to resolve differences?

C. Can the American Revolution be justified strictly on the basis of what England did to the American colonies?
Discussion Topic No. 4 27 Sept. - 5 Oct. 1972

Was the Revolution an expression of "majority rule?" Is the desire of the majority a valid position for the nation to follow?

Discussion Topic No. 5 6-12 Oct. 1972

A. Interpret "Shay's Rebellion" as to its effect on American political thought. Did it aid man's search for freedom and human dignity?

B. Compare Shay's activities with those of Sam Adams and the Sons of Liberty prior to the Revolution. How were they similar, dissimilar?

Discussion Topic No. 6 13-19 Oct. 1972

Evaluate the personal philosophies of Alexander Hamilton and Thomas Jefferson in relationship to the purpose and method of establishing a successful American government. Some areas you may wish to consider are:

A. What role was the common man intended to play in government?

B. Which man's "American Dream" was actually realized? Which was better for the country?

C. How was the constitution intended to be interpreted? From a modern day perspective, which was better?

D. Which man's point of view would have best realized the principles of the Declaration of Independence? Which man's position, in reality, was best for the country?

E. Which man's point of view has greatest acceptance today?

F. Which modern political party subscribes most to Hamiltonian views? Jeffersonian? Which party would you support? Why?
Discussion Topic No. 7 20-26 Oct. 1972

Interpret the pertinent parts of the "Monroe Doctrine" and state your position as to how far America should go today to enforce this doctrine.

A. President Monroe made "specific claims" as to America's rights in the Western Hemisphere. How accurate are those statements?

B. America's position in the world community has drastically changed since 1923. Have these changes altered the impact of the Monroe Doctrine?

C. Was America justified in announcing the Monroe Doctrine in 1823 without South American approval?

D. Do you agree with Presidents Eisenhower and Kennedy's handling of the Bay of Pigs invasion? Cuban Missile Crisis?

E. What should America's reaction be to the Marxist President of Chile?

Discussion Topic No. 8 27 Oct.-2 Nov. 1972

Criticize the arguments used by John C. Calhoun and President Andrew Jackson in defending the positions each took regarding nullification.

A. With which argument do you agree?

B. In a current dispute, who should set pollution standards in the states? Could the state best handle this problem within her own borders? Would the uniform action of the federal government meet the need of pollution control better?

C. What are some identifiable dangers of having the federal government control pollution standards? States?

D. What advantages would each have to offer?

Discussion Topic No. 9 3-9 Nov. 1972

This period of "manifest destiny" showed Americans at their most aggressive stage of history, but not their most attractive. Historians debate the motives which impelled American Expansion during the 1840's. What impressions or feelings do you have regarding the "manifest destiny" period?
A. Evaluate President Polk's activities. 1845-1846 as justifiable or as imperialistic.

B. Is imperialism acceptable? Justifiable?

C. Suggest five or six rationalizations by which expansionist Americans defend their territorial aggressiveness.

Discussion Topic No. 10 10-15 Nov. 1972

More has been written of the Civil War than of any other American conflict. A still growing store of literature, song, and legend centers upon this time. Perhaps because the human carnage and misery was so great, or perhaps because the tragic conflict left weighty problems unsolved to the present day, historians have examined and re-examined its causes. From your reading and study you should consider some of the following areas of discussion.

A. Evaluate the economic systems of the North and South. Which section do you find most appealing?

B. Summarize the values that were held by the North and South at this time.

C. Compare the feelings of racial hatred in the North and South prior to the Civil War, and today. Have these feelings changed? Explain.

D. What moral and ethical problems faced the North and South as the issue of slavery and equality became an area of conflict to many people? Were the northerns guilty of a form of slavery themselves? Which was worse?

Discussion Topic No. 11 1-7 Dec. 1972

Freedom. Human dignity. States' rights. Constitutional rights. Human rights. Freedom of association. Equal protection under the law. All of these words represent beliefs or values that human beings hold. Almost all of us would accept at least part of these values as our own. Each one of us, however, would define the word that represents our values differently. Each one of us would probably agree that each person in America would not have the same values that each other person had. Naturally, if our disagreement over values became serious enough we would be faced with a value conflict situation perhaps serious enough that we might resort to violence to attempt to resolve our disagreement.
A. Compare the condition of Negro people in 1859 with the condition of Negro people today. Give your interpretation of the term "equal protection under the law," and imagining yourself to be black state whether "equal protection" has been achieved.

B. Compare the terms "freedom of association" and "equal educational opportunities for all." Did these two values come into conflict in 1859? If so, in what way? How would you resolve this value conflict? Are they in conflict today?

C. Is there a value conflict between a belief in the "rule of law" and "freedom to obey one's conscience?" Is there a connection between morality and obeying the law? Would you have obeyed the fugitive slave laws? Are there similar moral-legal conflict existing today? Explain?

Discussion Topic No. 12 8-14 Dec. 1972

A. Summarize the issues that formed the basis of the value conflict between Andrew Johnson and the Radical Republicans.

B. Compare the strengths of the arguments that were used by each side of the conflict and state which point of view you would have supported.

C. State which point of view was most charitable toward extending the ethical standards of freedom and human dignity to all citizens.
Appendix E:

Seminar Discussion Check List and Student Record Sheet
SEMINAR DISCUSSION CHECK LIST

<table>
<thead>
<tr>
<th>No. of Responses</th>
<th>Name: ______________________ Date: ________</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Value Judgement</td>
<td>Statements in which the speaker expresses a preference for a person, object or position in the argument in terms of a social or legal value, such as personal privacy, freedom of speech or religion, or equal protection of the law.</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“Mr. Kohler certainly should have the right to run his business and to make contracts with his workers without union interference.”</td>
</tr>
<tr>
<td>2. Legal Claims</td>
<td>Statements in which the speaker asserts that someone has a legal right to do something, such as equal protection under the law, constitutional rights, etc.</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“According to the Constitution, even a murderer has the right to a fair and speedy trial.”</td>
</tr>
<tr>
<td>3. Factual Claims</td>
<td>Statements describing specific events or making predictive generalizations.</td>
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<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“The first attempt at integration was at Little Rock on September 4, 1957.”</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“Negroes are just as intelligent as whites.”</td>
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<tr>
<td>4. Source of Information</td>
<td>A statement describing the source on which a claim, a definition, or value judgement is based.</td>
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<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“My text book states that over 600,000 people lost their lives as a result of the Civil War.”</td>
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<tr>
<td>5. Definitional Claim</td>
<td>A statement about how a word or phrase is defined or should be defined.</td>
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<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“I believe that an emergency occurs when one or more people are in danger of being injured or of losing their lives or property.”</td>
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<tr>
<td>6. Case-Analogy</td>
<td>A set of statements which describes real or hypothetical situations analogous to the one under discussion.</td>
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<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“If your dad was arrested for speeding while on his way to save someone from great harm, would you still feel that everyone who breaks a law should be arrested?”</td>
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<tr>
<td>7. Clarification Procedural</td>
<td>A statement in which the speaker communicates something in order to focus attention, or a statement directed at controlling the immediate situation.</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“Let’s take a vote.”</td>
</tr>
<tr>
<td>8. Challenge</td>
<td>Statements challenging the statements of others.</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“I don’t think you’ve proven your point.”</td>
</tr>
<tr>
<td>9. Support</td>
<td>Statements supporting the statements of others.</td>
</tr>
<tr>
<td>1 2 3 4 5 6 7 8 9 10</td>
<td>“I agree that the war should never have been started.”</td>
</tr>
<tr>
<td>Tape No</td>
<td>1</td>
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<tr>
<td>Value</td>
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<td>Challenge</td>
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<td>Support</td>
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<tr>
<td>Date</td>
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Class Time
Appendix F:

Non-Media Discussion Group Evaluation Forms

Lesson 1 - 4, Discussion Evaluation Forms are reprinted from the Minicourse 14 materials developed by the Far West Laboratory for Educational Research.
DISCUSSION ANALYSIS

Name_________________________ Date________________________ Topic________________________

TAking A POSITION

Yes No 1. Did I state my position in a testable form?
Yes No 2. Did I fully understand the position of others?

DISCUSSION

Yes No 1. Did I use EVIDENCE, SOURCES, AUTHORITY, to support my position?
Yes No 2. Did I SUMMARIZE in order to clarify my position and the position of others?
Yes No 3. Did I attempt to keep the discussion on the subject?
Yes No 4. Did I make efforts to resolve differences?

CHALLENGING

Yes No 1. Did I challenge opposing views?
Yes No 2. Did I merely disagree or did I support my disagreement?
Yes No 3. Did I propose an alternate plan or solution?

PARTICIPATION

Yes No 1. Was I involved at all times in the discussion?
Yes No 2. I would rate my critical thinking ability in these discussions as:

- 5 4 3 2 1 0 1 2 3 4 5 +
LESSON 1
DISCUSSION EVALUATION FORM

How did you do in using discussions skills? Rate yourself on the following:

A. Directed my comments mainly to other students rather than the moderator
   - Didn't do [ ]  Did [ ]

B. Asked others what they thought
   - Didn't do [ ]  Did once [ ]  Did more than once [ ]

C. Engaged in personal attack
   - Didn't do [ ]  Did once [ ]  Did more than once [ ]

D. Monopolized the discussion
   - Didn't do [ ]  Did [ ]

How did your group do as a whole? Rate your group on the following. (These ratings are opposites. For example, if your discussion moved along smoothly, check box 4; if it bogged down, check box 1; boxes 2 and 3 are for middle ratings).

E. Discussion bogged down
   - 1 [ ]  2 [ ]  3 [ ]  4 [ ]

Discussion moved along smoothly

F. Students talked mainly to the moderator
   - 1 [ ]  2 [ ]  3 [ ]  4 [ ]

Students talked mainly to each other

G. Students did not learn anything
   - 1 [ ]  2 [ ]  3 [ ]  4 [ ]

Students learned a lot
LESSON 2
DISCUSSION EVALUATION FORM

After your discussion, rate yourself on the following:

A. Really listened to others
   Did not do □ Did sometimes □ Did most of the time □

B. Acknowledged previous speakers
   Did not do □ Did sometimes □ Did most of the time □

C. Questioned irrelevant remarks
   Did not do □ Did □ Did not need to □

D. Talked mainly to other students rather than the moderator
   Did not do □ Did □

Rate your discussion group on the following:

E. Discussion wandered
   1 □ 2 □ 3 □ 4 □ Discussion stayed focused on the main issue

F. Students not really listening
   1 □ 2 □ 3 □ 4 □ Students really listening

G. Students talked mainly to the moderator
   1 □ 2 □ 3 □ 4 □ Students talked mainly to each other
LESSON 3
DISCUSSION EVALUATION FORM

After your discussion, rate **yourself** on the following:

<table>
<thead>
<tr>
<th></th>
<th>Didn't do</th>
<th>Did</th>
<th>Didn't need to</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Asked for clarification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Asked others to give reasons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Gave reasons for own opinion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Acknowledged previous speakers</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rate your discussion **group** on the following:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Let unclear statements pass by</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>Asked for clarification when needed</td>
</tr>
<tr>
<td>F. Students didn't learn anything</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>Students learned a lot</td>
</tr>
<tr>
<td>G. Statements were not supported with reasons</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>Reasons given along with statements</td>
</tr>
</tbody>
</table>
LESSON 4
DISCUSSION EVALUATION FORM

What skills did you use in your discussion? Rate yourself on the following:

A. Reviewed main points of the discussion accurately
   - Didn't do
   - Did

B. Stated others' positions fairly
   - Didn't do
   - Did

C. Decided on a next step for yourself
   - Didn't do
   - Did

D. Changed my opinion as a result of the discussion
   - Didn't change
   - Changed somewhat
   - Changed quite a bit

E. Acknowledged previous speakers
   - Didn't do
   - Did sometimes
   - Did most of the time

F. Asked others for reasons
   - Didn't do
   - Did
   - Didn't need to

Rate your discussion group on the following:

G. Students not really listening
   - 1
   - 2
   - 3
   - 4
   - Students really listening

H. Students did not learn anything
   - 1
   - 2
   - 3
   - 4
   - Students learned a lot

I. Discussion had no effect
   - 1
   - 2
   - 3
   - 4
   - Discussion resulted in positive action
Appendix G:

Student Evaluation Form
STUDENT EVALUATION FORM

NAME ______________________________ GROUP ____________________________
CLASS ______________________________ YEAR ____________________________

1. What is your general reaction to the class you are completing?

2. Which topics have you enjoyed the most? Why?

3. Which topics have you enjoyed the least? Why?

4. What topics would you have liked to consider that were not?

5. What is your reaction to the recording and scoring procedures that have been used? State which method you think has been most helpful in helping you learn Critical Thinking discussion skills.

6. What is your feeling about the way the class presentation were made? How could the presentations be improved?
VITA

James Matheson Miller

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