AN EXPLORATION INTO THE RELEVANCE OF METHODS AND THE ORGANIZATION OF LEARNING EXPERIENCES TO THE OBJECTIVE OF CRITICAL THINKING IN HISTORY OF CIVILIZATION AT GREENVILLE COLLEGE

Thesis for the Degree of Ed. D.

MICHIGAN STATE UNIVERSITY

Peter M. Wickman

1960

This is to certify that the

thesis entitled

AN EXPLORATION INTO THE RELEVANCE OF METHODS AND THE ORGANIZATION OF LEARNING EXPERIENCES TO THE OBJECTIVE OF CRITICAL THINKING IN HISTORY OF CIVILIZATION AT GREENVILLE COLLEGE

presented by

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has been accepted towards fulfillment of the requirements for

Doctor degree in Education

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Date 2-12-60

O-169

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Peter M. Wickman

AN ABSTRACT

Submitted to the School of Advanced Graduate Studies of
Michigan State University of Agriculture and
Applied Science in partial fulfillment of
the requirements for the degree of

DOCTOR OF EDUCATION

Department of Education

Year 1960

Approved Paul L. Dressel

The general purpose of this study is to show how, through the proper organization of learning experiences in the History of Civilization, college freshmen can be taught methods of historical analysis and in the process make significant achievement in the general education objective of critical thinking.

In Chapter I, the writer discusses the importance of this objective in our society and suggests that the critical thinking skills can be used as an integrating principle in such a course.

In the second chapter, an ideal-type construct was adapted whereby it was possible to identify three ideal positions on the learning continuum. These included the ineffective organization of learning experiences, represented by the "A" position, those freshman history students in 1957-1958; the minimum effective organization of learning experiences, the "B" position, represented by the control group of students in the History of Civilization course; and the most effective organization of learning experiences for the attainment of the objective, the "C" position represented by the experimental group of students in this class.

The "B" position on this learning continuum stressed student motivation, application of historical understandings to contemporary problems, practice in the desired behaviors, sufficient time to think and continuity and sequence in learning. The "C" situation emphasized these criteria plus the use of small discussion groups, variety of experiences and the reciprocal nature of the learning factor. However, it was assumed that these eight characteristics

were absent from the "A" situation. An organizational scheme stressing the integrative concepts, skills and values of critical thinking was applied to both the "B" and "C" groups in an attempt to maximize the attainment of this objective.

In Chapter III the writer applied this ideal-type construct to these three classroom situations at Greenville College. This necessitated a description of the distinctive methods used with each learning situation. A variety of sources were used to depict the uniqueness of these groups, including observations of the instructor from his daily anecdotal record, course outlines, the variety of tests used, student responses on a curriculum evaluation study, student-teacher evaluation questionnaire, participation in class, and out-of-classroom activities, and the organization and selection of the total experiences within the various learning circumstances.

Results gained by the three groups were discussed in Chapter IV. Students in the three learning situations, identified by the various criteria, were given pre- and post-tests in the "Test of Critical Thinking Form G." The "B" and "C" groups were given pre- and post-tests on the S.T.E.P. Social Studies Test 1A.

Data from these tests suggested that the "B" group achieved more than the "A" group and that the "C" group had achieved to a greater extent than the "B" group in the objective of critical thinking.

It was concluded that greater gains in critical thinking

were made by the "C" group on the basis of observations made by the instructor, the testimony of students, grades on unit and final examinations, responses on teacher evaluation sheets, curriculum evaluation questionnaires, and improvement in attitudes as shown on pre- and post-test results of the Inventory of Beliefs.

These favorable results lend credence to the basic contention of this study, which was that maximum achievement in critical thinking could be attained in a course such as History of Civilization, if the learning experiences are selected and organized so as to effect the "C" criteria.

Peter M. Wickman

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PREFACE

Although a great many general education courses in the History of Civilization list the ability to do "analytical and independent thinking" among their objectives, it has too frequently been assumed that the objective was a natural effect of the history content and that organization and methods were secondary in its attainment. And though many instructors have been impressed with the importance of the objective, they have apparently felt that its achievement was not feasible for students in such a general education course. From the writer's reading of the literature, in meetings with the Illinois Critical Thinking Study Committee and in General Education workshops at Michigan State University, he has concluded that significant achievement in critical thinking was possible.

To transmit this feeling into effort necessitated the utilizing of numerous sources and the cooperation of many individuals.

Fellow workshoppers and Dr. Hugh Stickler, coordinator of the general education workshop at Michigan State University in the summer of 1953, aided in clarifying the writer's concepts. The writer's guidance committee, Dr. Paul L. Dressel (chairman), Dr. H. H. Kimber, and Dr. Walter F. Johnson, and Dr. Walker Hill as former chairman gave suggestions and raised questions which aided in the inception and design of the study.

As the instructor of the required freshman history course at

Greenville College, the writer participated in a cooperative study of the methods of attaining the objective of critical thinking sponsored by the Illinois Research Committee. Six Illinois liberal arts colleges were involved in the development of methods of achieving the objective of critical thinking.

In the fall of 1958, three of these schools planned to organize their basic freshman courses according to these methods. It was hoped that by means of this study, it would be possible to check on the validity of the methods devised. This thesis then, was an offshoot of this study plus an attempt by the author to identify the organization of learning experiences which maximizes the attainment of the critical thinking objective.

The implementation of the writer's ideas to the classroom situation at Greenville College was possible only through the cooperation of many individuals. It involved several hundred students in the writer's freshman history courses over a period of four years. It meant the cooperation of colleagues in various departments, as well as members of the social science division. Many hours were spent in committee meetings and conferences by faculty members participating in the critical thinking study. Several senior history majors spent considerable time collecting anecdotal information from individual students taking the History of Civilization course.

The administration of Greenville College aided in carrying out this study. Dean George Tade was most cooperative in scheduling History of Civilization at a favorable time and giving the instructor

cooperation of many individuals. It involved several hundred students in the writer's freshman history courses over a period of four years. It meant the cooperation of colleagues in various departments, as well as members of the social science division. Many hours were spent in committee meetings and conferences by faculty members participating in the critical thinking study. Several senior history majors spent considerable time collecting anecdotal information from individual students taking the History of Civilization course.

The administration of Greenville College aided in carrying out this study. Dean George Tade was most cooperative in scheduling History of Civilization at a favorable time and giving the instructor a free hand in its organization. Richard R. Stephens, chairman of the critical thinking study on campus, aided by reading the paper and making suggestions on the preliminary drafts.

Dr. Edwin L. Lyle, director of the Danforth Foundation Study for Superior Students at Greenville College, made a large contribution to the success of this study through his frequent valuable suggestions concerning the treatment and evaluation of the data.

The writer is specifically indebted to the following people: George Barr Carson, Jr., director of the Service Center for Teachers of History, for the assistance which his organization provided in making it possible for Dr. Fritorg Ander to come to the campus to discuss curriculum changes in the required history courses; Dr. Paul L. Dressel, who as chairman of my committee, provided guidance in

the design and writing of this thesis, which involved the writing and answering of numerous letters since the study was conducted away from the Michigan State University campus; and finally, to my wife Helen, for invaluable assistance in typing this copy and for her patience and encouragement through the years.

Thus, this thesis stresses the cooperative nature whereby modern educational research dealing with problems of higher education is conducted. The significant results achieved were made possible by the collective efforts of the administration, faculty, students, curriculum consultants, and the literature.

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THE DEFINITION, PURPOSE, METHOD, AND IMPLICATION OF THE PROBLEM

The Consideration of Critical Thinking As a Goal of General Education In Our Culture

Our modern world is rapidly becoming more complex and interdependent. And, in a democratic society where each day citizens are increasingly facing a fantastic assortment of problems, which are demanding recognition, understanding and solution if we are to survive, we appreciate the necessity of citizens trained in the skill of independent thinking. This need for instruction for critical thinking is reflected in the objectives of nearly every institution of higher learning in America. Regardless of size, be it a large university or small liberal arts college, institutions of higher learning recognize the value of critical thinking in the training of youth who will have the skills with which to meet the problems faced by citizens in our society. The primary aim of this study is to identify those learning situations which more adequately achieve the objective of critical thinking in a general education course in the History of Civilization at the freshman level of the liberal arts college.

It has been inferred that critical thinking is the sine qua non for social survival in contemporary society. Its importance can be readily evidenced as we consider the needs of our society, the needs of college students, and the writings of social scientists. These three sources verify that this objective is attainable within the frame of reference of a democratic philosophy of education and modern understandings of the learning processes.[1] The development of an informed, responsible and effective citizenry is a prime requirement for our democratic society where a basic concern for the worth of the individual and his role in the decision making process constitutes the core of our democratic values. Independent thinking generates an understanding of, and a means of resolving differences of opinion in a rational manner. The challenge of a changing society requires leaders in foreign and domestic affairs, as well as in science, engineering and industry, who are educated to make analytical and rational decisions in these areas. For as Dr. Charles Malik so aptly stated it in a commencement address at a mid-western university in June 1954:

> Nothing is more obvious ... than that history is decisively in the making today and yet the quality of decision is largely absent. There is an ominous drift, people appear overwhelmed ... It is as though the complexity and multiplicity of present

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[1] V. E. Herrick and R. W. Tyler, Toward Improved Curriculum Theory, (Papers presented at the Conference On Curriculum Theory, University of Chicago, Oct. 1947, No. 71, Monograph. The University of Chicago Press, 1950), pp. 56-57.

> issues is too much for the mind of man. But if one thing is certain, it is that where people refuse to decide, events will decide for them. And if personal decision is both difficult and risky, it is not at all certain that to allow events to decide impersonally, although relatively easy, is not itself a decision involving the greatest risks.[2]

In all probability critical thinking is the most secure foundation upon which to base such decision making.

Numerous other sources suggest the prominence of critical thinking in the attainment of more effective democracy.

The importance of a broad educational foundation in our society was sharply pointed out by the President's Commission On Higher Education as early as 1947.[3] This group indicated the imperativeness of extending educational opportunity and effective citizenship training to a greater percentage of the nation's youth.

> We shall have to devise patterns of education that will prepare them more effectively than in the past ...
> 2. To participate actively as an informed and responsible citizen in solving the economic, social and political problems of one's community, state and nation ...
> 11. To acquire and use the skills and habits involved in critical and constructive thinking.[4]

In their analysis of this last objective, this group of educational leaders further stressed the importance of critical thinking abilities.

> Ability to think and reason, within the limits set by one's mental capacity should be the mark of an educated person ... Development of the reasoning faculty, of the habit of critical

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[2]Huston Smith, The Purposes of Higher Education, Introductory Note by Charles Malik (New York: Harper and Brothers, 1955).

[3]Higher Education For American Democracy, The Report of the President's Commission On Higher Education, Vol. I (New York: Harper and Brothers, 1957).

[4]Ibid, p. 23.

> appraisal should be the constant and pervasive aim of all education in every field and at every level ...
>
> More to the purpose than extensive information and of much more lasting effect would be emphasis on the student's acquiring familiarity with the process of inquiry and discovery ... Arousing and stimulating intellectual curiosity into active and comprehensive education, and developing skill in gathering, analyzing, and evaluating evidence ... These should constitute the primary job of every teacher ...
>
> ... the open and inquiring mind and the habit of rigorous and disciplined investigation are the marks of free men and the sinews of a free society.
>
> General education therefore will concentrate not on the mastery of specific information, but on the fullest possible development of the motives, attitudes, and habits that will enable the student to inform himself throughout life.[5]

In a foreward to a report of a symposium on higher education, Dr. G. H. Compton, nationally known physicist and at that time chancelor of a university, states that we need to educate trained men who will be able to apply intelligence to social problems. He asserts that:

> The dominant note in the present concern of higher education is the rapid change of our social order ..., especially our increasing interdependence and our ... involvement in the world's affairs. The health of our society ... depends on our ability to educate men promptly who will pilot us wisely through these strange waters! ...
>
> Old standards must be re-examined before they can be relied on safely ... Only as our youth face the changing world with understanding and courage can our civilization maintain its healthy growth. The alternative is a catastrophe that we do not want to contemplate.[6]

The Social Science Committee of the American Council on Education Cooperative Study of Evaluation in General Education agreed that:

> Citizenship appears to demand one skill above all others. Even in voting ... the citizen must be able to analyze the

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[5] Ibid, pp. 57-58.

[6] Smith, op. cit.

> candidate with respect to the issues at the particular election ... The good life in a democratic society seems to rest fundamentally on one's ability to think critically about the problems with which he is confronted.[7]

Yet students may or may not identify these problems or "social issues" with which they are faced. Although students entering college seem to be particularly challenged by tasks that they can feel are essential preparation for the adult competition ahead of them; yet, effective citizenship demands a more comprehensive view of society with skills enabling him to diagnose and form judgments regarding social situations. A major argument of this thesis is that an analysis of the "unresolved conflicts" of history, interpreted in the framework of the critical thinking approach, can aid the students in making generalizations concerning current social problems. The importance of critical thinking as an objective in such a History of Civilization course in the liberal arts college, has been stimulated by recent educational trends observed by the author.

First, there seems to be wide agreement among educators concerning the need to broaden and develop the aims of general education to include critical intelligence as well as understandings. For, although American educators are not agreed on the means, they agree that "the development of critical intelligence, capable of being applied to many fields" is one of the pertinent aims of such general

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[7]Paul L. Dressel and Lewis B. Mayhew, General Education, Explorations In Evaluation (Washington, D. C.: American Council On Education, 1954), pp. 35-36.

education courses.[8]

Second, there is recognition of the lack, and therefore need by college students of critical thinking abilities. Faculty members participating in the Hope College study concluded that "a clear understanding of the principles of logical reasoning and familiarity with problem-solving procedures ... seem to be needed by every college student.[9]

Third, there is a trend in the direction of broad divisional type History of Civilization courses in an increasing number of liberal arts colleges. A summary of a recent survey by the United States Office of Education regarding social science requirements for the bachelor's degree showed that 57.8 per cent of the institutions reporting placed History of Civilization in the Social Science divisional rather than the departmental curriculum.[10]

A fourth trend is to extend the reach of educational objectives from those related to understandings to those relevant to the ability to evaluate and criticize.[11] An introduction to these

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[8]R. J. Havighurst, "Social Foundations of General Education," General Education, Fifty-first Yearbook of the National Society for the Study of Education, Part I (Chicago: The University of Chicago Press, 1952), pp. 73-75.

[9]John Hollenbach and C. DeGraff, "Teaching For Thinking", Journal of Higher Education, Vol. XXVIII, No. 3, (March, 1957), pp. 126-130.

[10]U.S., Office of Education, Social Science Requirements for Bachelors Degrees, (Washington, D. C.: U.S. Department of Health, Education, and Welfare, 1959), p. 26.

[11]Bloom et al., Taxonomy of Educational Objectives, Handbook No. 1 (New York: Longman's Green and Co., 1954), pp. 185-200.

skills constitutes the basic element of the historical method. The usefulness in later life of learning to criticize and analyze evidence and to arrive at new conclusions is stressed as well as the interrelatedness of the various social science disciplines.[12]

A further trend is to measure the achievement of these educational aims in terms of the "higher mental processes." This trend also is related to increased consciousness of and attention to critical thinking as an objective and has resulted in the revision of evaluation instruments so as to measure this goal. And out of these attempts at evaluation, the urgency of defining this objective in working terms has become apparent.

A sixth development has been in the direction of attempts to study methods of implementing the overall objective of critical thinking, by cooperative inter-institutional groups. Possibly the first significant contribution in this regard was the Eight Year Study. The Cooperative Study in General Education of the American Council On Education was particularly interested in the attainment of this, among other general education objectives, at the college level. As an outgrowth of this study, there have been a number of similar studies on a smaller scale. Among these have been that of the Illinois Research Committee on Critical Thinking, which has been concerned with the application and evaluation of methods related to the attainment of critical thinking.

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[12]Paul L. Ward, A Style of History For Beginners, Publication No. 22, Service Center for Teachers of History, a Service of the American Historical Association (Washington, D. C., 1958), pp. 1-7.

In reality these trends overlap, inasmuch as they are efforts of leaders in higher education to respond to the needs of our democratic society. However, these trends, together with the "post-sputnik" pressure on American education, suggest the increasing importance of critical thinking as an educational objective.

The Concern of Critical Thinking and the Lack of Its Contemporary Applications

Many studies have added perception as to the method of critical thinking. Added understanding of the higher mental processes have been provided by Charles Judd[13] and John Dewey.[14] And more recently, perception of the problem solving techniques of college students has been supplied by B. S. Bloom and L. J. Broder.[15] And, doctoral studies have shown how critical thinking is related to personality factors,[16] and to group achievement.[17]

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[13]C. H. Judd, Education As the Cultivation of the Higher Mental Processes (New York: The Macmillan Company, 1936), passim.

[14]John Dewey, Experience and Education (New York: The Macmillan Company, 1938), passim.

[15]B. S. Bloom and L. J. Broder, Problem Solving Processes of College Students (Chicago: The University of Chicago Press, 1950), passim.

[16]E. Gaier, "Relation Between Personality Variables and the Learning Process" (unpublished Ph. D. dissertation, Dept. of Psychology, University of Chicago), passim.

[17]H. M. Chausow, "The Organization of Learning Experiences" (unpublished Ph.D. dissertation, Dept. of Education, University of Chicago, 1955).

However, as one writer put it, there have been more "sales talks" written about critical thinking than reports of good research.[18] For there have not been sufficient studies giving evidence that specific methods and procedures used resulted in the optimum cumulative achievement of this objective. Chausow's study at Wright Junior College showed a relationship between the organization of materials between different classes and cumulative achievement as measured on the A.C.E. Critical Thinking Test in Social Science.

With a few exceptions then, the conclusion of the report of the Cooperative Study in General Education is still up to date when it suggests that much of the research to date has been separated from "teaching practice."[19] The personal experiences of the writer in the "Illinois Colleges Study on Critical Thinking", indicated a reluctance on the part of certain departments and individuals connected with these colleges to participate wholeheartedly in an endeavor to relate methods to an objective found in all their college catalogues. Some of the original institutions involved withdrew because of lack of interest in such a project, and we all discovered colleagues in our own institutions who not only refused to cooperate but argued against the necessity of such a study.

There were no dissenters regarding the value of critical thinking, but there were a variety of arguments against methods to

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[18]Finley Carpenter, "What Research Says About Critical Thinking," North Central News Bulletin, Vol. XV, No. 4 (January, 1956), p. 1.

[19]Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., pp. 281-285.

attain it. Some felt that it was emphasizing means as ends; others that it would detract from achievement in subject matter content area which they felt must be covered; others were secure in the feeling that they were already using the most effective methods to this end; and others felt that we were confusing the students with ideas that they could not handle at the freshman level. The last mentioned objection would be provided for if the curriculum were organized with relevance to this objective.

In a monograph, Toward Improved Curriculum Theory, R. W. Tyler states: "The practice of curriculum construction needs to be guided by a theory which has been carefully developed, utilizing an acceptable philosophy of education, based upon known principles of learning, and taking into account the results of school experience and experimentation."[20]

The studies mentioned previously have given insights into the process of critical thinking. However, there has been little attention given to the theoretical formulations of Tyler, in the organization of general education courses in social science.[21]

"Value-Conflict" and Historical Problems As a Means of Organizing Learning Experiences

The Western Civilization course is centered on a number of historical problems, that men can never fully agree on, but with which the student will be living the rest of his life. The student,

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[20]Herrick and Tyler, op. cit., p. 67.

[21]Chausow, op. cit., p. 11.

then, is the focus of the initial integrating process and it is assumed that he will begin to understand how men really behave in social and political groups of all sizes when he begins to consider these historical problems in terms of social values he holds.[22]

More specific organization of the course has been attempted by using T. C. Mendenhall's theme of the "struggle between individual and social authority" as a unifying principle.[23] This course invites the student to acquire an understanding of specific aspects of history and to make generalizations concerning the origin of present institutions, and conflicts and to propose solutions of a number of conflicts which have persistently challenged men throughout the development of Western Civilization.[24] One of the basic purposes of this problems method is to have the student learn to read diverse materials in an intelligent yet critical fashion.

A gathering of historians in 1953, who were members of the American Historical Association, agreed that the historians' skills center on diagnosing situations and forming judgments. What freshman students in a History of Civilization class need is to find that this is actually so, that good historical understandings can point toward convincingly sounder judgments, even though these might

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[22]E. J. McGrath (ed.), Social Science In General Education (Dubuque, Iowa: Wm. C. Brown Company, 1948), pp. 88-93.

[23]T. C. Mendenhall et al. The Quest For a Principle of Authority In Europe From 1715 to the Present (New York: Henry Holt and Company, 1948), pp. IV-V.

[24]H. T. Morse (ed.), General Education In Transition (Minneapolis: The University of Minnesota Press, 1951), pp. 105-107.

still be colored by the student's personal values. Students will thus be made to see that the skills acquired in studying history are identical to those frequently used in reaching judgments on complex human situations in everyday living.[25] Students must be challenged then, by materials and learning experiences so organized that they will summon their critical thinking faculties into full play. Such an approach will not only provide the student with training in critical thinking but introduce him to the historical method in the process.

Such an organization is not an attempt to "change the student's values," but to make him more aware of them and of the role they play in his decision making. He fulfills one of the main purposes of the course by gaining practice in identifying the basic assumptions and arguments of leading thinkers of the past and present. This organization stresses the value of suspended judgment and an awareness that judgments are seldom "black or white." This organization represents an attempt to apply Tyler's theoretical formulations to a divisional course, at the freshman level, of the liberal arts college.[26]

This approach makes it possible to derive and apply an effective means of attaining the cumulative maximum effects of critical thinking. This seems to be a significant approach because the critical thinking objective is being used as an integrating

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[25]Ward, op. cit., p. 2.

[26]Supra, p. 9.

force in the development of this inter-disciplinary course.[27] However, we need to be cognizant of certain problems and limitations implicit in the organization of such a course.

Problems Involved In the Organization of Inter-disciplinary Courses

The organization and purpose of such a History of Civilization course would be inter-disciplinary regarding content, understandings, and generalizations sought. Such a course would be what the President's Commission on Higher Education termed "general education, that is, education which has come to be accepted for those phases of non-specialized and non-vocational learning which should be the common experience of all educated men and women."[28]

During the last three decades four factors contributed to the rising importance of this development. They are:

a. The phenomenal specialization and fragmentation of courses in the liberal arts colleges.

b. The rise and partial failure of the elective system.

c. The growing complexity of life in modern times.

d. The increase of enrollment in the colleges and universities.[29]

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[27]Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., pp. 272-278.

[28]Higher Education For American Democracy, op. cit., p. 49.

[29]Sidney French (ed.), Accent On Teaching (New York: Harper and Brothers, 1954), pp. 1-20.

Whereas classical liberal education was typically designed for the intellectually elite and was subject matter centered, general education is typically designed for a wider population and is centered on the personal and social needs of the time. The fragmentation and specialization of traditional liberal arts curricula are replaced by unity and breadth.

Within this broad framework are found three major philosophies of method: rationalism, neo-humanism, and instrumentalism. Rationalism holds that ultimate Truth is revealed in the writings of the Great Thinkers of the Western classical tradition. Its approach tends to be authoritarian rather than empirical; its appeal is to the mind rather than to the whole student.

Neo-humanism resembles rationalism in its intellectual approach, but differs in not being committed to a specific philosophy. Both resemble liberal education in being more subject matter centered than student centered. The great majority of general education programs fall in this category.

Instrumentalism may be regarded as the "left wing" of general education. It operates from experience, rather than from authority; is inductive rather than deductive; recognizes relative values, not absolute values; is utilitarian rather than ornamental. It is student centered rather than subject matter centered; is designed for the many, not alone the elite; and for the whole student, not merely for his mind.

In employing these categorical terms, one must regard them

as abstractions denoting points along a continuum. In actual practice few schools will reflect absolutely and solely one philosophy. Most schools reflect some blending of emphases, some electicism.[30]

According to Sidney French, general education in social science has evolved through three phases in attempting to meet the problem of fragmentation and specialization mentioned above. First have come the survey courses in social science. These were inadequate as the end result was a patchwork of isolated facts. Second came the "block-gap" courses. These were usually built around a unifying theme. Third is the student-centered phase which is still in the process of evolving.[31] This last phase necessitates greater emphasis on the planning of learning experiences with the development of critical thinking as the overall integrating factor.[32]

And the final report of the A.C.E. Study recommends that critical thinking provide the integrating force for such an interdisciplinary course.[33] This objective can become a criterion of revelance whereby we select learning experiences and materials from the area of the social sciences. This is a synthesis of matter and method and not a course in "how to think."[34]

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[30]H. Taylor, "The Philosophical Foundations of General Education," Fifty-first Yearbook of the NSSE, op. cit., pp. 20-45.

[31]French, op. cit., pp. 12-14.

[32]Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., p. 65.

[33]Ibid, pp. 272-274.

[34]French, op. cit., p. 17.

The aim of this thesis is to delineate those methods of instruction and organization of learning experiences which best provide the integrating force for the achievement of critical thinking in a general education course in the History of Civilization.

The Organization of a Course In History of Civilization With Critical Thinking As An Integrating Principle

Reference has been made to the importance attributed to the development of the student's ability to think critically as an objective in general education.[35] Yet, Judd has stated that there is abundant evidence that the methods of teaching traditionally used in colleges fail to develop in a satisfactory measure the higher mental processes.[36]

The A.C.E. Cooperative Study found that new methods and materials, pointed at the achievement of agreed upon goals, were lacking. For the study felt that there were frequent discrepancies between the ideals sought and the status quo in the classroom. This gap between the ideal and the real in general education curriculum is the focus of this thesis.[37] For the basic approach of our study is the planning and organization of learning experiences germane to carefully determined objectives. A resume' of the four main points of the Tyler rationale is important in clarifying the basic problem

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[35] Supra, p. 5

[36] Judd, op. cit., p. 136.

[37] Lewis B. Mayhew, "The Cooperative Study of Evaluation In General Education," School and Society, LXXV, No. 1940 (February 23, 1952), p. 116.

of this study. These are:

First, the determination of objectives. The goal of education is the achievement of desired behavior changes. Various sources are tapped in deciding on the objectives of the educational program, viz, the student's needs, society's needs, and the opinion of the expert. In order to determine which goals are attainable, they are screened through a philosophy of education and through knowledge of the psychology of learning.

Second, learning situations. These should give the student practice in the desired behaviors which meet the test of the psychology of learning.

Third, the organization of the learning situation. These are organized according to some theory based upon the principles of curricular organization, the use of concepts, skills and values as unifying threads, tied together by some organizing principle using the principle of continuity and sequence to insure the cumulative effect, recommended by Tyler.

Fourth, evaluation of results. In order to determine whether the methods used were conducive to the objectives sought, the results must be evaluated with the other three steps in mind.[38]

The conclusion of several authorities on curricular development is that without organization, critical thinking cannot be achieved. In a recent yearbook of the National Society for the

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[38]Herrick and Tyler, op. cit., pp. 60-68.

Study of Education, R. W. Tyler states that, "Without organization, learning experiences will be perceived by many learners as isolated, chaotic, and haphazard."[39] Hilda Taba writes: "To achieve critical thinking, we need a curriculum which is organized around some concepts and ideas, and in which materials are selected and combined for teaching so that they contribute to the development of these ideas and their use."[40]

There are three hypotheses to be tested. The first is that before the achievement of critical thinking above the chance level can take place, certain minimum characteristics must occur. Second, these minimum criteria must be supplemented by additional ones if the greatest gains in critical thinking are to be made, and it would seem that such gains were related to the additional characteristics used. A third hypothesis seems obvious; that is, it is possible to identify methods of instruction which are relevant to the maximum growth of critical thinking through the use of subjective evaluation devices. The general hypothesis is that a continuum of learning experiences exists and it is possible to relate the differences between classes at different positions on this continuum, to a specific configuration of methods and organization of material.

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[39]R. W. Tyler, "Curriculum Organization," The Integration of Education Experiences, Fifty-seventh Yearbook of the National Society for the Study of Education, Part III (Chicago: University of Chicago Press, 1958), p. 106.

[40]Hilda Taba, "Problems In Developing Critical Thinking," Progressive Education, XXVIII (November, 1950), p. 45.

Purpose Of This Study

It is the intent of this study to set forth the methods used and to describe the manner of handling the data collected and to relate them to the hypotheses mentioned above.

The operational definition of critical thinking, developed by the Social Science Committee of the Cooperative Study of Evaluation of the American Council of Education, was adapted for this research for several reasons. First, because this behavioral definition was developed by a number of social science teachers at the college level, and is applicable to the analysis of historical sources. These behaviors were chiefly concerned with the student's ability to identify the central issue, recognize basic underlying assumptions, evaluate evidence or criticize historical sources or evidence, and to draw warranted conclusions.[41]

Second, since it reflects the ideas of classroom teachers who have shared similar problems in the teaching of different types of social science courses, it seems adaptable to a general education course focused on historical problems.

Third, this behavioral definition seemed to meet the needs of the students at our particular college.

And finally, the evaluation instruments used were designed to measure many of the behaviors described in this definition.

The theoretical proposals outlined in Chapter II are adapted

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[41]Paul L. Dressel and Lewis B. Mayhew, Critical Thinking In Social Science, A Handbook of Suggestions for Evaluation and Teaching (Dubuque, Iowa: Wm. C. Brown Co., 1954), pp. 1-3. See Appendix B.

from a survey of a few carefully developed studies and research projects which suggest some of the specific things instructors can do to obtain greater results in the achievement of the critical thinking objective.

Criteria for the selection of learning experiences were derived from the ideas of the following. Methods of analyzing historical evidence and the recognition of human factors in such evidence were developed from ideas of a recent publication of the American Historical Association, and the Carnegie Papers on the Teaching of History. These papers stressed methods whereby students can become "actively engaged in the process of forming and revising judgments in the light of evidence."[42,43] The study of both the "critical-analytical and the socio-cultural" methods of approaching the study of history was stressed by Gottschalk.[44] R. W. Tyler, writing in the Fifty-Seventh Yearbook of the National Society for the Study of Education, identified three elements of learning; viz., concepts, skills, and values.[45] The Hope College study urged that thinking habits as well as abilities be taught.[46]

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[42]Carnegie Papers on the Teaching of History, Teaching the First Ten Assignments In An Introductory History Course (Pittsburgh, Pa.: Carnegie Institute of Technology), pp. 1-35.

[43]Ward, op. cit., pp. 2-3.

[44]Louis Gottschalk, Understanding History (New York: A. A. Knopf, Inc., 1950), pp. 30-37.

[45]Tyler, loc. cit., pp. 112-115.

[46]Final Report of the Ford Study Committee, Teaching for the Development of Thinking Abilities and Habits, passim.

The principal organizational scheme was based on the ideas of Judd[47] and Dewey[48]. This involved the interaction of the levels of thinking--understanding, application and generalization; and, the use of problematic situations which would include the concepts referred to above.

Continuity from one problem to the next is provided for in several ways. Within each problem the emphasis is from historical understandings to generalizations that appear to provide explanations of the development of contemporary problems.[49] And the learning situations relative to the selected content would strive to attain the behavioral aspects of the critical thinking objective, i.e. the student would be obliged to "identify central issues; to recognize basic assumptions; to evaluate the evidence; and to draw warranted conclusions."[50]

Type of Evidence To Be Compiled

Data were collected to verify whether differences occurred among the various groups along the continuum. This information can be classified according to the quantitative or total gain in

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[47]Judd, op. cit., passim.

[48]John Dewey, Experience and Education (New York: The Macmillan Company, 1938), passim.

[49]Gottschalk, op. cit., p. 31.

[50]Dressel and Mayhew, Critical Thinking In Social Science, op. cit., pp. 1-3. See Appendix B for full description.

achievement on test scores and according to subjective evidence relating to the criteria specified in this study.

The quantitative data were provided by the A.C.E. Test of Critical Thinking Form G, developed and validated by the First A.C.E. Committee on Pervasive Objectives I[51], and the S.T.E.P. Social Studies Test which was developed by a planning committee of college examiners for the Cooperative Test Division of the Educational Testing Service.[52] And further information on attitudes of students was provided by the Inventory of Beliefs developed by the A.C.E. Committee on Pervasive Objectives.[53]

The presence or absence of the basic criteria, which identified the group along the learning continuum at Greenville College, were identified by the information compiled in the manner suggested in the following paragraphs.

To check the extent of motivation and student interest in the various classes being compared, a number of means were employed. Students were asked to rate required courses in order of their interests, and to evaluate the teachers and classroom situations employed. Student participation in activities related to class work, e.g. membership in history clubs, etc., as well as the quality and quantity of written work, e.g. daily assignments and research papers.

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[51]See Appendix B for description and validation of "A Test In Critical Thinking Form G."

[52]The description of the S.T.E.P. Social Studies Test and normative data is in Appendix D.

[53]See Appendix C for description of the Inventory of Beliefs and validation data.

Records of observations by the instructor, his colleagues and several history majors were analyzed.

Information regarding the extent of application of historical understandings to problematic situations, and the degree to which practice in the behaviors of critical thinking was achieved in the various classes, was obtained by comparing the syllabi, the classroom situations or learning experiences provided and anecdotal records.

Was sufficient time provided in the various situations to do an effectual job of critical thinking? To ascertain this the number of units per semester, the number of assignments within each unit, and the instructor's observations were analyzed.

A similar check was made on the organization of learning experiences to provide for continuity and sequence. The courses were compared regarding the use of integrative elements and the cumulative effect from unit to unit in assignments and examination.

Data concerning the learning environment were examined to check for the existence of the characteristics such as small discussion groups; varied experiences to meet individual needs and interests; and the "reciprocal nature of the learning factor." The information collected was analyzed to determine the extent to which individual interests and abilities were provided for and the importance given to the student's role in the learning process.[54]

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[54]Nathaniel Cantor, The Teaching Learning Process (New York: Dryden Press, 1953), p. 79.

Explanation Of The Data

The material available will be examined to answer these questions: One, Does a continuum of classroom learning situations actually exist?[55] The existence of various criteria along the assumed continuum will be checked against evidence analyzed in order to verify the congruity of the various groups of students. Second, Do significant differences accrue as a result of meeting the criteria along the continuum? Results will be examined from the various groups according to the differences of the scores derived from a post-test based on the "Test of Critical Thinking Form G", The Inventory of Beliefs, and the S.T.E.P. Social Studies Test. Analysis of variance will be used to test whether the differences of these groups are significant.

The chief end sought in this thesis is the verification of this hypothesis: The organization of learning experiences to include the creation of a reciprocal learning situation, makes a significant difference in the achievement of critical thinking.

Summary

This study endeavors to apply Tyler's rationale to the organization of learning experiences in the History of Civilization course at Greenville College. This is an attempt to show that students at the college freshman level can be taught the skills of

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[55] H. M. Chausow found that a continuum existed when different classes and different instructors were used. Our task is to see whether it is possible to provide unique differences in the learning situation between two groups within an identical group (Chausow, op. cit., p. 26).

analyzing historical evidence and in the process apply these skills to contemporary social problems.

In the definition of this problem several proposals were analyzed. First, teaching for critical thinking is imperative in a democratic society. Second, attempts to reach this objective in general social science courses in liberal arts colleges are generally conceded to be ineffective. Third, it is possible to organize learning experiences in a History of Civilization course to meet this objective. Fourth, inter-disciplinary courses of this type have developed to overcome the fragmentation and lack of integration in the curricula of the liberal arts college. Fifth, the critical thinking objective can be used as an integrating principle for such a course. Finally, the data gathered can be used to check the concept of a learning continuum and whether greater achievement in critical thinking resulted from application of more inclusive criteria.

CHAPTER II

ADAPTATION OF A THEORETICAL FRAMEWORK FOR THE GENERAL EDUCATION HISTORY OF CIVILIZATION COURSE

Introduction

A number of basic assumptions seem to have been implied in our sketch of the various aspects underlying this study. Two of these are: that generally speaking, college students have not developed the habit of making independent judgments based on their classroom learning experiences; and secondly, that such critical thinking abilities are attainable in the actual classroom circumstances if the proper learning experiences are provided. In order to provide such experiences at the college level, proper organization must be attained.

This chapter is primarily concerned with the development of a framework to provide such an organization of learning experiences for the divisional course in the History of Civilization. There is considerable data suggesting how critical thinking can be promoted in the classroom, but a paucity of attempts to spell out and apply a theory and an organizational scheme aimed at the achievement of maximum cumulative results of critical thinking at the college level.

In deriving such a theory the author was influenced by

application to the general social science courses at Wright Junior College by H. M. Chausow, of the ideal-type construct of Max Weber, the ideas of Charles Judd and John Dewey, and his use of R. W. Tyler's concept of the organizational structure in the curriculum.[1]

The Derivation of the Ideal-Type Construct

The ideal-type construct is suggested as a means of clarifying complex social situations by Max Weber the German social historian.[2] Weber examines social realities and from these formulates the ideal-type construct. E. W. Burgess suggests that, "many of these ideal types are polar conceptions, emphasizing the importance of examining concrete reality in the light of a continuum between two logical extremes which have only a conceptual existence."[3] Huston Smith suggests that our culture has taught us a number of "pat opposites" which are used in everyday life to obstruct clear thinking.[4] The social scientist then, has taken this everyday logical concept, realizing that it represents extremes and not the average, and has applied it to the understanding of our social conditions. This ideal-type has been used by social scientists for

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[1]Chausow, op. cit., pp. 26-33.

[2]Max Weber, The Methodology of the Social Sciences, trans. E. A. Shils and H. A. Finch (Glencoe, Illinois: The Free Press, 1949), pp. 42-43, 90-112.

[3]E. W. Burgess and H. J. Locke, The Family, Appendix A "The Ideal Types In Family Research," (New York: American Book Company, 1945), p. 756.

[4]Smith, op. cit., pp. 1-3.

the study of individuals or groups in a situation where it was difficult to delineate the extremes from the average in the real circumstance. It was suggested to the writer that these ideas could be adaptable as a frame of reference whereby classroom experiences in a general education History of Civilization course could be compared.

Adaptation of the Ideal-Type Construct To the Identification and Comparison of Classroom Experiences

In order to relate achievement to methods used, it is necessary to identify groups of students along a continuum. This could be more aptly provided for if another ideal position complemented the theoretical conception of the ideal-type construct. This third position would allow for the operation of chance factors outside of observed experiences in the attainment of critical thinking skills.

The writer adapted the procedures used by H. M. Chausow, to this study by determining three assumed positions along a continuum of learning experience.[5] These three locations are: ineffective organization of learning experiences; minimum effective organization of learning experiences; and most effective organization of learning experiences. We have termed these "A", "B", and "C" positions respectively.

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[5]Chausow, op. cit., p. 28.

Two general hypotheses are based on the theoretical existence of these positions on a given continuum. One is that the reality of such ideal groups can be inferred by definition. The second is that between the groups of students identified by these hypothesized positions, important differences in the achievement of critical thinking will occur.

Particular characteristics relevant to the three positions aided in their identification. These are shown and related to the ideal-type construct in the chart on page 30.

A study of this chart shows that the minimum characteristics necessary for significant achievement are the "B" criteria. The "A" position is the absence of the "B" criteria, and the "C" group is deriving maximum profit from the "B" criteria plus additional characteristics.

The rational for selecting these characteristics was based on a behavioral definition of the objective of critical thinking, ideas of authorities in the field of curriculum construction, and suggestions gleaned from numerous conferences with instructors participating in the Illinois Colleges Study Group on Critical Thinking. The sources used were relevant to the concepts of critical thinking as applied to historical interpretation and analysis held by the author. In our examination of these traits, it should be emphasized that this study is primarily focused on their impact on group results rather than on individual achievement.

CHART I

A SCHEMATIC ILLUSTRATION OF THE IDEAL-TYPE CONSTRUCT[a]

Continuum of Learning Experiences		
"A"	"B"	"C"
Ineffective Organization of Learning Experiences	Minimum Effective Organization of Learning Experiences	Most Effective Organization of Learning Exper.
Want of stress on motivation	Application of historical understandings to contemporary problems	Application of historical understandings to social problems
Want of application of historical understandings	Limited practice in the desired behaviors	Individual practice in the desired behaviors
Want of practice in desired behaviors	Sufficient time	Sufficient time
	Student motivation	Student motivation
	Organization using continuity and sequence	Organization using continuity and sequence
		Small discussion class
		Variety of experiences
		A climate of learning stressing the reciprocal nature of the learning factor

[a]Adapted from H. M. Chausow, op. cit.

The writer assumes that these characteristics are operative within the classroom situation. A logical description of these positions will be given in the following sections.

Ineffective Organization of Learning Experiences

The "A" Position

Probably the most important lack in the "A" position is that of motivation of the student. Nathaniel Cantor in his book The Teaching Learning Process suggests that one of the basic propositions of modern learning which the teachers in his study found hardest to practice, was that "if the student has wholehearted interest in doing the task that significant learning will result."[6] The difficulty of acquiring skill in critical thinking as a mere by-product of studying a given subject is emphasized by R. L. Thorndike in a recent yearbook of the National Society for the Study of Education.[7] Thus we posited that the absence of the application of historical understandings to contemporary problems would be a second characteristic of the "A" position. The third characteristic which is wanting in this position is the "absence of practice in the desired behaviors." The student then must have a background of experience providing him with skills in the solving of problems.[8] Additional characteristics which are absent in the "A" position will be discussed in relation to the "B" position.

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[6]Cantor, op. cit., pp. 104-105.

[7]R. L. Thorndike, "How Children Learn the Principles and Techniques of Problem Solving," Learning and Instruction, Forty-ninth Yearbook of the National Society for the Study of Education, Part I (Chicago, Illinois: University of Chicago Press, 1950), pp. 208-211.

[8]Ibid.

The Minimum Organization of Learning Experiences

It will be necessary to define those characteristics related to the "B" position in operational terms and use them in illustrating this position.

Student motivation.--Modern theories of learning stress the importance of motivation in the learning process. S. M. Corey suggests that interest is the key to directing the student's thinking.[9] Ernest Haggard in a doctoral study, implies that motivation is the most important factor in the learning process.[10] And Wilhelm Reitz in the Encyclopedia of Educational Research, intimates that motivation is the "determining tendency" or "governing influence of volition."[11] For without interest and motivation, students would not be stimulated to "take on" a problem.[12] Havighurst in his chapter on the "Social Foundations of Education" in a recent yearbook of the National Society for the Study of Education points out that the "motivational barrier" prevents students from achieving the goals of general education.[13]

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[9]S. M. Corey, "Psychological Foundations of General Education," Fifty-first Yearbook of the NSSE, op. cit., p. 53.

[10]E. A. Haggard, "An Evaluation of Certain Conceptions In Learning Theory," passim (unpublished Ph.D. dissertation, Harvard University, 1941.)

[11]Wilhelm Reitz, "The Higher Mental Processes," Encyclopedia of Education Research (New York: The Macmillan Co., 1952), p. 541.

[12]Ibid, p. 545.

[13]Havighurst, Fifty-first Yearbook of the NSSE, op. cit., pp. 71-95.

These writers add weight to the writer's conclusion, that without motivation to guide their learning, students would not endeavor to put forth the necessary effort to do critical thinking. Motivation then seemed to be one of the minimum factors operative if the student is to achieve a significant increase toward the objective.

Application of historical understandings to problematic situations.--Earl S. Johnson of the Social Science Division, University of Chicago, has made an important distinction between the discussion of social problems and problematic situations in the classroom. Unless the circumstances being studied are problematic to the student, even though they be interesting and informative, they become mere "intellectual ratholes" and are not very useful in evoking situations which require the students to develop critical thinking abilities.[14] Johnson upholds Dewey's idea when he maintains that problematic situations are those in which conflicting pieces of evidence are obvious and where contradictory views make a ready answer improbable.[15] In the application of historical understandings to such situations, one of the emphases will be unresolved issues of history, with an attempt to apply these to present conflicts. John Dewey suggests that a blockage in behavior must occur before

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[14]Chausow, op. cit., p. 33, cf. Earl Johnson, "Freedom and Discipline In the Social Sciences,", pp. 1-14.

[15]John Dewey, How We Think (Boston: D. C. Heath and Company, 1933), passim.

reflective thought is stimulated.[16] The Zeigarnik effect seems to be operative in learning situations of this nature.[17] The content of these problematic situations should be well-grounded in the needs of the student as well as related to those of the society. Such situations must deal with vitally and socially useful data, and with problems pertinent to man's life in a democratic society, and the student should be given opportunity to apply the critical thinking process.

Practice in the desired behaviors.--Effective thinking in the social sciences consists of dynamic, coherent transfer of the thought process which is ended only when an adequate solution is reached. Yet, the transfer of this learning from one situation to another is proportional to the degree to which the situations are similar in structure or meaning. "This can mean that the similarity might often be ... that of a pattern rather than of learning specific parts. This practice then is to be that of the organization of educational experiences stressing the thinking processes in relationship to the social sciences".[18] Stroud states that "provisions should be made in the school procedure for the exercise of any economy of method of study whose employment seem desirable ..."[19] He suggests

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[16]John Dewey, Democracy and Education (New York: Macmillan and Company, 1923), pp. 179-192.

[17]Gardner Murphy, An Introduction To Psychology (New York: Harper and Brothers, 1951), p. 316.

[18]J. B. Stroud, "The Role of Practice In Learning," The Psychology Of Learning, Forty-first Yearbook of the National Society for the Study of Education, Part II (Bloomington, Illinois: Public School Publishing Company, 1942), pp. 365-366.

[19]Ibid, p. 370.

a number of effective means of practice, viz., class discussion, written assignments, etc.[20] Dewey's claim that one "learns by doing"[21] is probably even more basic to this characteristic of providing practice in the desired behaviors for the student. Furst's study on the relation of learning outcomes to the use of learning situations demonstrates the importance of student practice.[22] Hilgard and Russell in their chapter of the Forty-ninth Yearbook of the National Society for the Study of Education also stress the importance of this characteristic.[23] This is consistent with the concept of the goal of education defined as those activities which elicit behavioral changes. Dressel and Mayhew in Explorations In Evaluation, state that "long term studies of student development cannot be of great value until more serious attention is given to relating classroom practice to the avowed educational objective."[24] It thus seems of utmost importance that the student be given problematic materials to provide practice in problem solving.

Sufficiency of time.--One of the characteristics agreed upon

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[20] Ibid.

[21] John Dewey, How We Think, op. cit., passim.

[22] E. J. Furst, "Effect of Organization On Learning Outcomes," Journal of Experimental Education, Vol. XVIII, (March-June), pp. 215-228, 342-352.

[23] E. R. Hilgard and D. H. Russell, "Motivation In School Learning," Forty-ninth Yearbook of the NSSE, op. cit., p. 67.

[24] Dressel and Mayhew, General Education, Exploration In Evaluation, op. cit., p. X.

by members of the Illinois Colleges Research Committee on Critical Thinking, was that in the teaching for the achievement of this goal, the material should be so arranged as to give students time to do critical thinking.[25] H. M. Chausow refers to the report of an evaluation study by Tyler in which the number of problems considered was decreased from twenty-one to seven for two semesters and this resulted in an increase of the student's abilities to apply the principles of critical thinking.[26] In the writer's experience with the required departmental course at Greenville College, it was found that attempts to organize a typical history course around numerous problems proved unsatisfactory without some limitation of materials used. The problem is to achieve a balance between too few and too many problems. At Harvard, in the Civilization course for example, only eight major topics are considered throughout the year. Professor S. H. Beer gives the rationale for such selective treatment of historical topics "the question is not, 'does the course touch on all the great books or events or institutions?' but rather does it select and organize its materials in such a way that the student continually gets new light on certain central problems."[27] The author feels that focusing the student's attention on seven or eight of these central problems is necessary if the organization of

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[25]Illinois Colleges Research Committee, Suggested Techniques for Critical Thinking. (See Appendix E)

[26]Chausow, op. cit., p. 38, cf. R. W. Tyler.

[27]Earl J. McGrath (ed.), Social Science In General Education (Dubuque, Iowa: Wm. C. Brown Company, 1948), pp. 3-5.

learning experiences is to result in the attainment of a significant increase in the student's ability to think critically, at both the "B" and "C" positions.

Organization using continuity and sequence.--David G. Ryans, writing in the Forty-first Yearbook of the National Society for the Study of Education, states previous learning should always set the stage for subsequent learning. Activity which is similar to earlier activity is thus facilitated.[28] New learning, which is based on existing response patterns, will be more easily acquired since the acquired habits and skills will serve as motives. And the interest value of new learning is intensified by its affinity with earlier experiences.[29] The Civilization course at Harvard is based on "great issues" or problems. These continually recur in new forms in subsequent problems. There is then, a continuity in terms of problems and in an accumulation of informed opinion from problem to problem.[30] Judd argues that it is the major task of the schools to endeavor to teach students to make comparisons and draw contrasts, to look for explanations based on previous experiences and to learn to express clearly the relationship between events and facts.[31]

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[28]D. G. Ryans, "Motivation In Learning", Forty-first Yearbook of the NSSE, Part II, op. cit., p. 313.

[29]Ibid.

[30]McGrath (ed.), op. cit., p. 8.

[31]Judd, op. cit., p. 193.

The Organization of Learning Experiences For the Maximum Cumulative Effect

It was necessary to consider additional characteristics which were needed to complement the minimum criteria in order to obtain the maximum cumulative effect in the achievement of critical thinking in the History of Civilization course. It was posited that the addition of these characteristics--small discussion classes, varied experiences, and what has been termed the "reciprocal nature of the learning factor"[32]--ought to contribute to a greater achievement of critical thinking. This suggested several basic hypotheses of the study: first, that among the various groups pertaining to the three idealized positions, there would be significant differences in the achievement of the objective of critical thinking; second, if the above were proved, it would seem apparent that better methods of teaching for this objective could be inferred from the criteria of the ideal-type construct.

Small discussion groups.--Discussion in small groups, providing for interaction between participants, characterizes the ideal learning situation for the attainment of the objective sought. A comparative study of the lecture method and the discussion method in relation to the learning outcomes has been made by Benjamin Bloom.[33] He discovered that discussion in small groups provided for greater gains in critical thinking. He noted that activity, i.e. talking on

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[32]J. P. vonGrueningen (ed.), Toward A Christian Philosophy of Higher Education (Philadelphia: Westminster Press, 1939), p. 93.

[33]Benjamin S. Bloom, "Thought Processes In Lectures and Discussions," The Journal of General Education, VII, No. 3 (April, 1953), 160-169.

the part of the learner, did not automatically aid in the learning process. He found that passive learning was operative on the part of the non-participants. However, he states that "when a number of persons engage in the same activity in a group, the other persons serve as competitors and that this rivalry and competition tends to have a facilitating effect on learning.[34] Thelen's studies in learning through group interaction conclude that involvement on the part of the student is one technique of achieving the greatest results in the educational process.[35] Keith Tyler indicates that discussion is a constructive process involving listening and thinking as well as speaking. He concludes that discussion contributes toward the student's attainment of the important goals of higher education, including the skills of critical thinking, problem solving, independent judgment, the scientific method, etc.[36]

Variety of experiences.--There will be a great variation of student interest and ability in the Civilization course. This will necessitate varied experiences to achieve the maximum results, allow for the variation in interest and abilities and provide practice in the desired behaviors. Edgar Dale, speaking at a symposium at the University of Minnesota recently, stated that "Mark Hopkins made

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[34]Ryans, Forty-first Yearbook of the NSSE, Part II, op. cit., p. 318.

[35]H. A. Thelen and R. W. Tyler, "Implications For Improving Instruction In the High School," Forty-ninth Yearbook of the NSSE, Part II, op. cit., pp. 308-310.

[36]Russell Cooper (ed.), The Two Ends of the Log (Minneapolis: University of Minnesota Press, 1958), p. 254.

education personal. He made it real." And he goes on to raise the question of how college teachers might make use of "real" and "stimulated reality" and thus provide for a variety of learning experiences.[37] Dewey warns against too few or too many such experiences, but suggests that a sufficient variety is necessary.[38] These experiences ought to provide the student exercise whereby he may develop generalized integrated knowledge.[39]

The reciprocal nature of the learning factor.--A number of the seven characteristics mentioned above anticipated the existence of what W. E. Hulme aptly terms a "creative human relatedness in the learning situation or the 'reciprocal nature of the learning factor."[40] As Edgar Dale implies, we need to inject a creative element into the learning process. He states that "our aim is to have the student learn more than the model exemplifies, to get something qualitatively different from what has been presented ... a creative element must be added."[41] Whether or not the pupil learns will depend, then, on whether or not he is made a part of the learning process. And the

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[37] Ibid, pp. 195-196.

[38] Dewey, Democracy and Education, op. cit., passim.

[39] W. A. Brownell and G. Hendrickson, "How Children Learn Information, Concepts, and Generalizations," Forty-ninth Yearbook of the NSSE, Part I, op. cit., pp. 114-115.

[40] vonGrueningen (ed.), op. cit., pp. 93-95.

[41] Cooper (ed.), op. cit., p. 193.

teacher by including himself tries to instill the idea that all are approaching a problem together.[42]

In this characteristic there are several propositions that should be implicit if the organization of materials and methods are to approach the maximum ideal. First, the dignity and worth of each student is emphasized. The concept of man's worth is more than one of the themes in the material discussed, but it also is evident in the learning process. The student senses this respect for his integrity and will be more inclined toward freer participation in all activities.[43] Secondly, this factor requires a permissive atmosphere where students are free to inquire, to discuss, and to compare, and which encourages honest expression of opinion, diversity in viewpoints and most important, original thinking.[44] Thirdly, this factor emphasizes what Ruth Eckert terms the right and obligation of private judgment.[45] The students will be expected to study independently and to reach their own conclusions rather than depend on textbooks which are as one writer put it "juiceless arid summaries of secondary sources."[46] Finally, the inclusion of the teacher

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[42]Cantor, op. cit., p. 84.

[43]Ibid.

[44]Cooper (ed.), op. cit.

[45]Ruth E. Eckert, "Materials and Methods In the Christian College," in Toward a Christian Philosophy of Higher Education, op. cit., pp. 127-128.

[46]Cooper (ed.), op. cit., p. 195.

himself in the learning process suggests a most important point. The teacher, by including himself, tries to communicate the idea that all are approaching the problem together.[47] Excellent educational situations are, to use William H. Whitehead's descriptive expression, "suffused with suggestiveness." The student might attempt to emulate the teacher in order to understand him, but in the process the better students should be challenged to transcend him.[48]

The writer proposes to use these three additional characteristics plus those discussed above to define the positions[49] on the ideal-type construct and their presence or absence in the organization of learning experiences to identify actual classroom situations which seem to approximate these positions. We are assuming then, that a continuum of classroom learning situations exists which are identifiable by these criteria of the ideal-type construct.

The Adaptation of the Concepts of Judd and Dewey In Suggesting Effective Methods for Maximum Results

Although the ideal-type construct aids in the identification of classroom situations, it does not however, suggest the most effective method of attaining the maximum results.

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[47]Cantor, op. cit., p. 84. [48]Cooper (ed.), op. cit., p. 193

[49]Supra, pp. 32-37.

The ideas of Judd and Dewey were adapted to this study to derive a framework which was designed to provide the maximum results needed.

C. H. Judd emphasizes generalized knowledge as a primary educational goal. In his book, The Cultivation of the Higher Mental Processes, he describes a sequential development from memory, through application to generalization. The basic goal of the educative process is emphasized as being that of generalized knowledge. With this generalized knowledge the student is able to more accurately and quickly apply his learning to new situations.[50]

The writer attempted to adapt Judd's ideas to a general education course in History of Civilization for college freshmen in the small liberal arts college. In this study, the higher level of understanding was considered the fundamental level from which to begin the student's development of critical thinking skills. Louis Gottschalk has suggested that the historian might consider himself a social scientist of the past by arriving at historical understandings and from these reach generalizations that appear to be valid and which provide explanations of the development of contemporary events, thoughts and institutions.[51]

Our supposition is not that the lower mental processes are unnecessary, for they are fundamental elements in the sequence of

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[50]Judd, op. cit., passim.

[51]Gottschalk, op. cit., pp. 31-33.

learning used. Reitz, in the Encyclopedia of Educational Research, spells out the role of these levels of learning and stresses the importance of the application of the higher mental processes.[52]

Dewey's writings regarding the experiential continuum[53] in which learning experiences blend into one another, furnished insights into the need for the provision of learning experiences which interacted with one another and which thus enriched the total understanding of the student. The need to provide problematic learning situations based on historical understandings using the organizational concepts of continuity and sequence becomes an essential factor in this study.

Our interest is in the transfer of critical thinking abilities to related problematic situations. The emphasis is therefore, on the organization of learning situations which aid in the development of valid generalizations. And the particular learning situations which deal with the content selected would be directed at providing the student with opportunities to utilize a variety of analytical and interpretative devices basic to the behavioral aspects of critical thinking.

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[52]Encyclopedia of Educational Research, op. cit., pp. 544-548.

[53]Dewey, Experience and Education, op. cit., passim.

Application of the Tyler Rationale Within This Organizational Framework

The rationale of R. W. Tyler furnished several insights regarding the precise characteristics to be included in this framework. The need to furnish some "threads" or elements which are woven together by this organizational principle so as to achieve the optimum results was satisfied by integrative concepts, skills, and values.[54] Consequently, Tyler's emphasis on the need for an organizational principle was adapted to the needs of this study.

The organizational plan for this thesis was to make use of a limited number of "unresolved issues" in history; these issues or problematic situations derived from history, served as the organizational structure; integrative concepts, skills and values were used as the organizational threads; and sequential development from historical understandings to generalizations regarding contemporary problems were used as the organizational principle.

The integrative concepts are those basic concepts which recur in each problem. These integrative concepts are the theme; the quest for authority, viz. (a) the development of individual liberty and (b) the conflict between individual liberty and social authority, and the concepts of, (1) the nature of historical-mindedness, (2) the complexity of causation in a historical episode, (3) the complexity of cultural change and historical continuity, (4) social

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[54] R. Tyler, Fifty-seventh Yearbook of the NSSE, Part I, op. cit., pp. 112-115.

forces as manifestations of human power, (5) the proper perspective of personalities in historical developments, (6) the role of ideas in social processes, (7) and the evolution of international organizations for the prevention of war.

The integrative skills are related to the critical thinking processes such as analyzing historical evidence by utilizing critical thinking abilities.[55] The integrative values are likewise relevant to the critical thinking processes in terms of the appreciation of the scientific method in historical analysis; of objectivity, that is an understanding of the role of personal biases in understanding history, and social science; applications of historical understandings to contemporary social problems; and willingness to withhold judgment until further evidence is presented. These concepts, skills and values served as the basis of continuity (that is, they recur throughout the course) and sequence (depth of understanding and comprehensive application to succeeding problems.)

In this manner, the organizational principle based upon the levels of thinking and their interaction tended to unify these concepts, skills and values, and provide for the achievement of the maximum cumulative effect. The development of the ability to make social science generalizations from historical analysis is an important objective of the course.[56] These generalizations were

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[55] Supra, pp. 20-21.

[56] Gottschalk, op. cit., p. 33.

achieved through the application of the critical thinking process as defined in this study, and were brought to bear upon the contemporary problems used to relate the History of Civilization course material to "unresolved issues" of this Age.

This organizational principle seemed to provide for maximum cumulative results especially where the "C" criteria were operative. H. M. Chausow had proved that a theoretical framework similar to this, resulted in significant difference in the achievement of critical thinking between various sections of the same class taught by different instructors.[57] Our purposes were somewhat different from his in that the writer planned to organize the last two learning situations described above within a single classroom. In this way the writer hoped to discover whether the application of the "C" characteristics would result in significantly better achievement in critical thinking than the operation of the "B" criteria in the same classroom. In such a situation it was hoped that the delineation of methods conducive to the greatest achievement of critical thinking would be possible. The instructor variable would be held constant by containing type "B" and type "C" in what would on the surface appear to be an identical classroom situation.

Summary

This chapter has been a description of the theoretical framework used in this study.

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[57] Chausow, op. cit., pp. 40-42.

In using the ideas of Weber and Burgess adapted by Chausow, an ideal-type construct of learning experiences was developed for our own purpose. Three ideal positions were identified representing the ineffective, minimum effective and most effective organization of learning experiences. It was hoped that this ideal-type construct would aid in the identification of the actual learning situations used in this study.

A sequential organizational scheme to insure the maximum development of the student's abilities to do critical thinking was traced. The ideas of Judd, regarding the levels of thinking, were adapted to Dewey's concept of learning situations blending together along an experiential continuum.

That part of the Tylerian rationale, relevant to the organization of learning experiences stressing the importance of an organizational plan was used. A number of problems in historical analysis made up the organizational structure. The organizational elements were interwoven through the organizational structure, and thus served as the threads of continuity and sequence and these are tied together by the organizational principle. The application of this organizational scheme to the various learning situations ought to aid in the attainment of the objective at the maximum position on the continuum as identified by the ideal-type construct.

CHAPTER III

APPLICATION OF THE THEORETICAL FRAMEWORK TO LEARNING SITUATIONS IN THE HISTORY OF CIVILIZATION COURSE AT GREENVILLE COLLEGE

Introduction

The development of the student's ability to do critical or independent thinking is accepted as one of the basic objectives of Greenville College, a small church related college of liberal arts and sciences. In the post World War II years, the faculty rewrote the educational objectives of Greenville College to include among its aims "to help each student develop the ability to think, including the use of the scientific method."[1] More recently, the faculty of the social science division agreed that one of the important objectives of the curriculum in this division was, " to help provide a background for 'critical and constructive thinking' regarding significant local, national and world problems."[2] The faculty of Greenville College agrees with other educators and with Huston Smith in particular, who wrote that, "critical thinking is not the only kind, but it is a tremendously important kind of thinking

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[1] Greenville College Record, Announcement of the Sixty-Eighth Year 1959-1960, Vol. LI, No. 1 (Greenville, Illinois: Greenville College, 1959), p. 7.

[2] Ibid., p. 75.

in which every liberally educated student should acquire some facility.[3]

The intent of this chapter is to apply formulations developed in Chapter II, to actual classroom situations so as to evaluate their applicability.

This theoretical framework was applied to the History of Civilization course at Greenville College in 1958-1959, which was one of three Illinois colleges participating in a study relative to the relationship of methods and achievement of the objective of critical thinking, under the sponsorship of the North Central Association Committee on Liberal Arts Education. This was a cooperative effort by these colleges to stimulate the conscious use of methods which the group felt would promote the achievement of critical or independent thinking in the various required freshman classes. A planning committee made up of instructors from the participating colleges agreed on some of the common methods to be used and the types of data to be collected. Exhibit B was developed to be used as a common guide for the colleges.[4] Instructors were to be made more aware of the educational process and of the need of continuous evaluation by keeping a daily log and handing in a report every three weeks, of the kinds of activities utilized in the various areas which were different from those used formerly, and which seemed to

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[3]Smith, op. cit., p. 164.

[4]See Appendix E for a copy of Exhibit B.

elicit activities conducive to growth in the objective.

Objective data was also collected and analyzed on the freshmen for the year 1958-1959 and compared with like data on the freshmen of 1957-1958. This included pre- and post-tests on the A.C.E. Critical Thinking Test Form G and achievement tests such as the S.T.E.P. social science tests.

The general assumptions of this Illinois Study seemed to be that (1) the freshman class of 1957-1958 was somewhat equal in ability to the classes of 1958-1959, and that there had not been an overall conscious effort on the freshman level to achieve the objective; (2) through a concerted conscious effort, critical thinking at the freshman level could be achieved in the general education courses; (3) achievement in critical thinking could be ascertained by analyzing the pooled observations of the participating teachers and students as well as objective data, i.e., results of a Test In Critical Thinking Form G.

Using this Illinois Study as general background, the writer planned to set up an experimental classroom situation in the History of Civilization course. By organizing the class materials and learning experiences according to the framework set down in the previous chapter, it was hoped that it would be feasible to delineate the relationship between methods and organization of experiences as they affected growth toward this most vital objective.

In this chapter our task is to associate the ideal-type construct with the actual classroom situations and methods

representing the respective "A", "B" and "C" positions identified; and to apply the organizational scheme in the experimental group so as to approach as nearly as possible the maximum end of the continuum.[5]

Identification of Actual Classroom Using the Ideal-Type Construct

These theoretical positions along the continuum were helpful in identifying learning situations that were similar to the ineffective organization of learning experiences, the minimum organization of such experiences, and the most effective organization of learning experiences necessary for maximum achievement in the ability to do critical thinking. The writer did not feel that the maximum end of this continuum existed when this study was begun, so it was necessary to set up a learning situation comparable to this position.

Students taking the American History course as their social science requirement in 1957-1958 in their freshman year, represented the "A" extreme position on the continuum. The control group in the History of Civilization course represented the "B" position. The experimental group in this course represented the "C", or extreme position on the continuum.

The American History course as taught prior to 1958-1959 did not meet the criteria posited as necessary for the minimum achievement of critical thinking. The writer felt that, although historical understandings were listed among the objectives, there was little

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[5]The means of derivation and the rationale were defined in the previous chapter.

attempt in the organization and selection of the learning experiences to provide for the application of these understandings to problematic situations which would contribute to the achievement of critical thinking abilities.

This course, although superficially organized around problem areas, did not provide experiences which were problematic to the student.[6] The syllabus was organized around problems related to the forty-seven chapters of the textbook.[7] The course used lecture-discussion situations with the hope that students would make the application of understandings gained to current problems.

The learning situations did not furnish the student practice in thinking critically. The mimeographed syllabus, "Guidelines to American History," included questions and projects which were based on the text and related readings. In addition to weekly reading assignments the students were to read and analyze an approved biography each semester. Because of the variety of books read, this report was to follow a standard outline. Since there was no discussion of this reading in class, and because it was virtually impossible to test over such material, this project did not as a rule provide a basis for evaluation of the student's ability to critically analyze historical material.

Class discussions and lectures were focused on arriving at

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[6]Chausow, op. cit., p. 50. cf. Earl Johnson.

[7]Thomas A. Bailey, The American Pageant (New York: D. C. Heath Company, 1956).

basic factual knowledge and understandings of the development of American History. Little if any, attention was paid to the basic critical thinking abilities, e.g. test items on the final examinations were mostly of the factual recall type.

Results of various formal and informal observations of the classroom situation cited in Chapter IV, all suggest that student motivation was lacking in the American History course. Although there were individual students who were stimulated because of appreciation of content, yet the concern of this study is with the overall group impact of the course and any generalizations made must be in group terms.

In responding to questions 6-10 on the Curriculum Evaluation Questionnaire,[8] juniors and seniors who had taken their general education work at Greenville College were asked to rank the "relative value in which they held these courses while taking them." The 131 students ranked the courses in this order: Humanities, Communications, Physical Science, Biological Science, and American History was last.

Questions 26-30 asked the students to "rate the comparative value of these courses since completing them." Only 12.4 per cent felt that the American History course was most valuable as compared with 22.7 per cent who thought this for the Humanities course and the others were rated in between, but all were over 20 per cent.

In this course, the instructor attempted to combine discussion techniques with lecture presentations. The students' lack

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[8] "Curriculum Evaluation Questionnaire" was developed as a check on student attitudes toward the achievement of general education objectives by the author.

of preparation frequently stymied such attempts. No doubt classes of sixty-five to seventy students contributed to lack of participation and all too often what little discussion took place was carried on by several "talkers"; the majority maintained passivity unless called on. Although small colleges traditionally pride themselves on their personal approach, classes of this size conducted in this manner, discourage the attainment of such a goal.

Although course requirements were spelled out rather carefully in the syllabus, the students did not feel free to discuss with the instructor one of these requirements, and each semester there were a number of reports written which were not apropos to this assignment. The teacher's knowledge of the interests, goals, etc. of the student was likewise meager; he was hard put just to know the name of each student.

The lack of interest and participation in extra-class activities is indicative of the absence of this criteria.

Further evidence given below suggests that the criteria mentioned as necessary if significant achievement in the goal of critical thinking was to occur in such a class were absent.[9]

The Organization of Learning Experiences In the History of Civilization Course

After several years of planning and revision a new general education or divisional course in History of Civilization was

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[9] Infra, Chapter IV.

introduced on a trial basis in the fall of 1958. Our task was to keep as close a check as possible on this course to insure that it would fulfill to a much larger extent than the previous courses the objectives of general education which it was organized to attain. This could be facilitated somewhat by working with the Illinois Study[10] in reporting observations of classroom situations and methods used which seemed to result in achievement of the particular objective of critical thinking. The writer hoped to more specifically relate such achievement to specific methodology by dividing the History of Civilization class into two groups, the control and experimental.[11] The control situation would meet the "B" criteria of the ideal-type construct as well as serving as a check on the experimental group and thus aid in isolating those methods which would result in the approximation of the maximum end of the continuum.

The nature of the course and the materials selected seemed to necessitate a greater degree of organization than was shown by the criteria used by Chausow[12] in basic social science courses at Wright Junior College, if they were to result in a minimum effectiveness of achievement in critical thinking.

The "B" Classroom Situation

Aside from the fact that the purpose of the course was defined more broadly and that the content was different from the

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[10] Supra, p. 50.

[11] These groups were randomized and were found to be statistically equal on A.C.E. scores and critical thinking pre-test scores.

[12] Chausow, op. cit., pp. 54-65.

previous required course, the following characteristics were used.

The course was organized into four problem units stressing the application of historical understandings to social science problems, or problematic situations. So the number of problems was reduced by five-sixth's (24 to 4). The writer felt that there is considerable evidence in the literature[13] bearing out the impossibility of trying to "cover the waterfront" in such a course and still maintain the focus on the application and generalization of historical understandings. So it was decided that a few selected problems, if adequately presented and analyzed in terms of a method of attack would be helpful in gaining the objectives of a general education course. We likewise had decided to relate the methods used to the objective of critical thinking so that each problem unit was designed to advance questions involving the student's critical thinking abilities.

As a consequence of the Illinois Study, student motivation and interest became a conscious goal of the instructors of those courses involved, including History of Civilization.

The course opened with a discussion of the role of the Middle East today. As this was just a few months following the Lebanon intervention, interest was still high, since the students had seen and heard a great deal concerning this problem in newspapers and on radio and television programs. From this discussion

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[13] Supra, p. 30, 37. cf. McGrath.

it was not difficult to raise questions about origins of Middle Eastern civilization, and several filmstrips were used to familiarize them with the birth of Western civilization in the three river valleys. The first unit had these five objectives:

1. Motivation of the students toward History of Civilization as a general education course;

2. Introduction of the scientific method and critical techniques to historical analysis and interpretation;

3. A summary of tentative problems which could be covered using the "value-conflict" approach;

4. An attempt to get members of the class involved in committees for the planning of important questions for the other units;

5. To show the importance of historical mindedness in understanding contemporary problems.

Students were asked to read and analyze an article about the Middle East today and the article[14] was analyzed in class using the critical thinking skills. They were assigned a short paper comparing the difference in the Middle East today and 5000 years ago. Materials used would be the article mentioned, filmstrips and library materials.

Student interest was high in both groups in Unit I; however, the instructor experienced some difficulty in trying to get the students to apply specific findings to general concepts such as historical mindedness, etc., and to see the relationship of the present to problems of the past.[15]

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[14]R. N. Frye, "Islam and the Middle East," Current History, Vol. 30, No. 178 (June, 1956), pp. 327-331.

[15]Instructor's anecdotal record, September 29, 1958.

Classroom experiences also provided practice in the critical thinking behaviors. Assignments were given in terms of problems and a variety of tests and daily quizzes were used with both the control and experimental groups. A frequent type of quiz was to have the students use the critical thinking abilities to analyze several key paragraphs in a historical reading, e.g. "Pericles' Funeral Oration," from Thucydides' "History of the Peloponnesian War."[16] These were usually open book quizzes and so the stress was not "on what?" but "what do you think?"

We will briefly examine some of the experiences selected to contribute to this characteristic during the four units that comprised the first semester.

Since the fall session opened a week late, because of delay in the building program, there was a total of forty-three class sessions in the semester. The first sixteen sessions dealt with an introduction to the critical method as used in historical analysis, a general over-view of the central theme, "the conflict between individual liberty and social authority," using a number of readings from the classical period to illustrate its existence. The next eleven class periods used problems from the medieval period to continue this discussion. Feudal obligations and the Magna Charta illustrated the contractual aspects of society; the struggle between Henry IV and Pope Gregory and Philip IV and Pope Boniface VIII

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[16]J. L. Beatty and C. A. Johnson, Heritage of Western Civilization, Selected Readings (New York: Prentice Hall Co., 1958), pp. 16-20.

illustrated the struggle between spiritual authority and temporal power. The next seven sessions dealt with the new stress on "man as the measure" and source of authority in the Renaissance. The ideas of Machiavelli and the individualism of Cellini and the political and cultural changes were discussed (these last two were touched on very lightly). The final three weeks dealt with the religious revolution of the sixteenth century emphasizing its modern implications, including the freeing of the individual conscience which was considered as one of the possible effects of this struggle.

In each unit questions were raised which it was hoped would stimulate the transfer of the historical understandings arrived at to present day problems. In a written analysis of selections by Plato[17] describing the trial and death of Socrates, the students were asked to relate his reasoning to several contemporary situations, e.g. a conscientious objector on trial during the cold war; a witness before a Congressional investigating committee; and the defense of a pacifist who had agitated against further H-bomb testing.

The four half-hour examinations were varied, so as to provide opportunity to apply the critical thinking abilities. It would seem that "practice in the desired behaviors" was superficially at least, equal. Unique treatment in this characteristic was afforded the experimental group in this class.[18]

Both groups were provided with more "sufficient time" to

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[17] Ibid., pp. 49-70.

[18] Infra, pp. 70-71.

think about the material than in the organization of the American History course. The chronological arrangement of the four problem units was designed to give significance to the factual knowledge covered. At the same time, it was not our intent to try to cover all the material in a given time period, for this would have prevented allowing for sufficient time to think about the significance of the material and to relate it to significant issues in a significant manner.[19] In as far as possible, periodic tests were kept short enough to allow for the careful consideration of thought items included.

Materials were organized according to the conceptual framework described in Chapter II, which furnished an organization using continuity and sequence. Recurring concepts of our western heritage were stressed. The critical skills were used as a device for analyzing and applying historical ideas to the understandings of present problems.[20] Critical thinking values and attitudes were stressed in each unit so that sequential development was provided for equally as far as the time spent in the class was concerned. As the students went from one problematic situation to another, they built upon their previous learning experiences. The later assignments were more difficult than the previous ones; this was more plainly evident when students who had not had the first semester enrolled in the second and discovered that numerous casual references

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[19]Smith, op. cit., pp. 149-153.

[20]Supra, Chapter II, pp. 45-47.

were made to previous problems by students who had taken the first semester of the course. It was hoped that the students would apply the understandings that they had gained in earlier units to the identification and analysis of material for later problems. Yet, without the careful treatment given the "C" group, students often missed the relationship between the subsequent learning situations.

The presence of these five characteristics[21] in the overall learning situation involving the History of Civilization course thus identified it as approximating the minimum or "B" position on the ideal-type construct we had adapted.[22] Hence, significant changes in the ability of the students to do critical thinking should take place according to the hypothesis. Yet, maximum results were not obtained and additional characteristics were necessary if the maximum achievement of the objective was to be reached.

Learning Experiences In the "C" Classroom Situation

This involved an attempt to maximize the organization of learning in the experimental situation in order to locate it in a relationship approximate to the extreme position identified as the "C" end of the learning continuum. The basic difference would then be in the more effective use of the "B" criteria[23] with the introduction and use of these additional characteristics, varied experiences, small classroom situations and the "reciprocal nature of the

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[21] Supra, p. 30. [22] Chausow, op. cit.

[23] Supra, p. 30, 32-37, 55-62.

learning factor."

The pertinency of these characteristics in providing learning experiences approximating the maximum end of the ideal-type construct will be shown in the following description of their application to the first four units of the Civilization course.

Our first problem was a greater emphasis on the "B" criteria. This included greater stress on the application of historical understanding to contemporary problematic situations.

This was achieved to a greater degree by meeting in committees with the "C" group, obstensibly to plan the unit's activities and in these meetings arrive at a hypothesis of the central problem of the unit which would then be discussed in class. For instance, in Unit I, two committees each made up of six members of the "C" group, met after several class periods and discussed "what were the central themes in the classical period", and "which of these might be present in our society today." In this instance, the themes agreed upon were the "existence of extreme individualism and extreme respect for social authority in Greece" and "the struggle to achieve liberty in Rome."[24] These provided opportunity for discussion by the entire class; however, the "C" group seemed to have a greater interest in such "application and generalization" of the material. One member of this group made this statement, "Ifound class discussion especially interesting and helpful in realizing the possibility of a relationship between the Greek ideas of 'justice and

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[24]Instructor's anecdotal record, Steering Committee Unit I.

freedom' of the individual, the Roman concept of natural law and our ideas today".[25] In attempts to further emphasize this characteristic, we frequently made use of current situations suggested by the class. In our analysis of Polybius' "Histories", the current election was mentioned as an illustration. In trying to decide whether his conclusions that "prosperity leads to deterioration" and "that rivalry for office is the beginning of such decay"[26] were valid, several of the students in the experimental group took exception. Their argument was that advances made since his time have strengthened faith in the voter as well as the "vote getter."[27]

Provision for greater application of historical understandings to present day issues contributed to increased motivation of students. The students in group "C" displayed a consistently higher degree of interest throughout both semesters. For, analysis of the anecdotal records kept by the instructor and questionnaires and rating sheets show that group "C" was superior in interest, attendance, completion of assignments and participation in class.[28]

In addition to the ideas used with the "B" group, the following discussion techniques were applied with greater success in

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[25]Instructor's anecdotal record, Unit I.

[26]Beatty and Johnson, op. cit., pp. 104-115.

[27]Instructor's anecdotal record, November 5, 1958, Unit I.

[28]Infra, pp. 98-99, 101.

stimulating the "C" group.

"The Creative Discovery Method" was one of these; however, it was used infrequently because of obvious limitations.[29] The writer began one class session by drawing what was supposed to be a gallows on the blackboard. This was supposed to be the symbol of a new religion, "how many would be willing to follow a religion which had such a symbol?" We were trying to get at the difficulty of explaining the rise of Christianity. This provoked considerably more discussion than it would have if I had merely asked the class to list the causes for the triumph of Christianity in the Roman age.[30]

In discussing Polybius' argument, that "the success of Rome was the result of the form of its constitution"[31], a student from the "C" group made the statement that "this was the case in the United States." The instructor challenged him to prove this. This was one instance where the "double dare you method"[32] elicited a lively response as well as the application of historical understanding to contemporary problems, for in order to illustrate the fallacy of this statement members of the group applied it to the U.S.S.R.[33]

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[29]R. H. Ennis, "Critical Thinking, More On Its Motivation," Progressive Education (May, 1956), Vol. 33, No. III, pp. 75-85.

[30]Instructor's anecdotal record, November 17, 1958.

[31]Beatty and Johnson, op. cit., pp. 104-115.

[32]Ennis, op. cit., pp. 76-77.

[33]Instructor's anecdotal record, November 3, 1958.

In the free-wheeling sessions that frequently developed, students in the "C" group often challenged other members of the group or of the class. Fortunately, this did not often occur but on occasions it was reported to the writer that these rather heated discussions were continued in the cafeteria line and through the lunch hour.[34]

Socio-dramas and role playing were used to create interest and discussion. Sometime after we had covered Unit one, a student remarked that "that little impromptu drama did more to help me remember the Greek ideas of 'freedom of the individual' than anything else."[35]

The conscious effort of the instructor to know the student's abilities and to provide them with varied experiences which would allow for individual differences, was related to the matter of student interest. And the instructor had an excellent chance to know the students in the experimental group since there were only twelve in the group. The instructor used the personal folders, which are filed in the office of the dean and readily accessible, to learn the student's major or field of interest, high school achievement and background in content being covered, his percentile rank on the A.C.E. Psychological Examination, and pre-test scores on the critical thinking test. Conferences were held with members of the

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[34]Instructor's anecdotal record, November 3, 1958.

[35]Instructor's report of interview with student, January 1959. This was in reference to several select scenes from "Antigone" which were used as basis for role playing situations.

"C" group early in the semester and these together with the give and take of class discussion, oral reports, quizzes and observations aided in knowing the student's strengths and weaknesses as well as his interests. The instructor was able to provide varied experiences to satisfy these individual differences.

In the required American History class of 1957-1958 and in the "B" group in the History of Civilization, the above average and superior students were not provided for. As greater emphasis was placed on the "C" criteria, this was greatly improved in the experimental group in 1958-1959. Especially was this true in terms of varied experiences. The anecdotal records of the instructor have numerous illustrations showing how the "superior" students were given a greater variety of learning situations in which they were challenged to think critically. In his contacts with the experimental group, the instructor felt that he had an obligation to identify those students who were substantially above average in academic ability as well as help the average and below average students. These learning experiences included special reports, quizzes, acting as committee chairmen, visits to lectures, attendance at the college "Colloquia," and the planning and writing of a research paper related to some problem in which they became interested during the first eleven or twelve weeks of the semester. The problem for this paper was to be decided on only after some exploratory reading, and a conference or conferences with the instructor,

in which the problem was defined, and a method of attack was agreed on. Contrasted with this use of a variety of experiences, was the treatment of the control group. Although they were in the same class, they were seldom called on if anyone else was seeking permission to talk, rarely if ever gave a special report and if any of them asked about a paper, I merely said "fine, here are some topics, which one do you want to write about?" and gave them my approval without a great deal of encouragement or help. Consequently, eight of the twelve in the "C" group wrote short research papers, but only four of twelve in the "B" group.[36] At no time was anyone told that these projects were required, but students in the "C" group were more interested and reacted to such a challenge and gained additional practice in critical thinking by using another variety of learning experience related to the objective.

In addition to a variety of tests, quizzes, etc., short written assignments on aspects of the problems were used which lent variety to the learning situation out of class as well as giving practice in the critical thinking behaviors. Films and filmstrips were used and analyzed using the critical thinking skills.

Although all assignments were aimed at the achievement of practice in the desired behaviors, the papers of the experimental group were carefully read and suggestions carefully written regarding ways of improving their handling of the basic skills of critical thinking. Several different groups of students from the

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[36]Instructor's anecdotal record, November 10, 1958.

experimental section acted out their interpretations of "Antigone" and then led the class in a discussion of how this tragedy was an epitome of the Greek views of man's relationship to social and religious authority.[37] In the test for this unit, the students were asked to evaluate the role of the main characters in this tragedy. The persons who had participated in the role-playing did a much better job of this part of the test than the others. All students had been required to compare Pericles' "Funeral Oration"[38] with a speech by an imaginary contemporary politician. The students in the "C" group, even though this was only in the fourth week of the course, more readily identified the central issue and underlying assumption of his oration and applied his arguments to a contemporary political speech. In Unit Four on the Protestant Reformation, the film "Martin Luther" was shown and discussed. And it was also made available for an evening showing the week before finals.[39] In discussing this problem, the class was asked, "which hypothesis would probably be more acceptable to Protestants today?: (a) the reformation was an attempt to purify church administration, (b) the reformation began as a reformation of church doctrine." The class voted first for the (a) hypothesis, then several of them from the experimental group objected. They got the idea the instructor was getting at when they reasoned that it was (b), because Luther taught

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[37]Instructor's anecdotal record, October 18, 1958.

[38]Beatty and Johnson, op. cit., pp. 16-28.

[39]Infra, pp. 93-94.

that "salvation was by faith and not works." After some discussion, the group agreed with the instructor that "b" might be the most acceptable today if we were to maintain the distinctiveness of the Protestant tradition, for the Roman Catholic church had had reform of its administration in the sixteenth century. The group decided, however, that both hypotheses are important in understanding a social movement as complex as the sixteenth century reformation, and so group processes, in this case at least, arrived at the most accurate interpretation.[40]

The different types of examinations used throughout the course served as learning experiences as well as evaluation instruments. The new situations given in the unit examinations required the students to use the critical thinking abilities they had acquired. On one multiple-choice unit test they had to give the reason for their choice of the answer selected on "3 x 5" cards. Post-test reviews of these tests were used to further their value.

It was possible then, through using a variety of learning experiences, to furnish the students in the "C" group considerably more practice in the critical thinking abilities, than the control or "B" group.

Providing for any uniqueness in the sufficiency of time was unnecessary since the writer had assumed that flexibility of class schedule, and the reduction of problem units, were a requisite if the

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[40]Instructor's anecdotal record, January 16, 1959, Unit IV.

minimum amount of achievement in the objective was to be attained. The "C" group however, responded more fully to the opportunities provided, judging by the quality of the work performed and the per cent of completed assignments.

Continuity and sequence, as a rule, were operational, more or less equally, in both groups.[41] The variable here seems to have been the greater motivation of students in the "C" group to utilize such continuity and sequence. Each unit test emphasized understandings but the emphasis changed to that of application and generalization by the time of the final.

Possibly the greatest carry-over from problem to problem was in the emphasis on the critical thinking skills. These were used in the interpretation of the historical sources. A member of the "C" group commented that she found herself asking her roommate, "What is your underlying assumption?" and "is your conclusion warranted?" in the course of discussing any of their subjects.[42] Another student wrote, "I never thought that I'd be able to understand the writings of Plato and the ideas of Socrates, but I find that the critical thinking skills are making this possible and interesting. One skill that I feel that I am learning is to think and to separate facts from opinions and assumptions in my reading, in other words, critical thinking."[43] Another student stated in an interview at the end of

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[41] Supra, p. 36-37, 61-62.

[42] Instructor's anecdotal record, Unit II.

[43] Instructor's summary of students reaction to open ended questionnaire regarding the value of the course, January 29, 1959.

the semester, "the course has improved my awareness of the need to think, and has helped me to develop the ability to fit ideas into a pattern."[44]

Analyses of the "Curriculum Evaluation" questionnaire and the "Student Reaction To Classroom Teaching" sustain these examples and also reflect the effects of organizing the course according to the organizational schema of the critical thinking skills in the "C" group.[45]

The writer assumed that the permissive atmosphere and variety of learning experiences which typified the "C" group were more characteristic of a small discussion class than the sporadic participation of the "B" group. The attitude of students in the "B" group corresponded more closely to that of students participating in a lecture-discussion class. This conclusion is supported by evidence given which compares the ratio of participation per class of each group.[46] The writer is aware that overt participation is not the only kind that results in learning, for Bloom's studies concluded that both covert participation and the quality of cerebral activity were important.[47] The writer's contention is not that talking more in class resulted in greater learning activity for the "C" group, but vice versa. It should be noted at this point that

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[44]Instructor's anecdotal record of interview, January 29, 1959.

[45]Infra, pp. 99-101.

[46]Infra, p. 101.

[47]Bloom, "Thought Processes In Lectures and Discussions," op. cit., pp. 160-169.

discussion is only one aspect of the teach-learning process,[48] and even then must be more broadly defined than just speaking. The experimental group then seemed to be more resolute in listening, observing, and thinking as well as speaking. Evidence given below supports this conclusion.[49]

The small class effect of group "C" was seen in their readiness to participate in the various modifications, viz. group dynamics, socio-drama, panels and special reports while the number of volunteers for such activities from the "B" group was relatively small. It should be noted that where there was a choice between two students, the student from the experimental group was chosen if at all possible.

Members of the "C" group met with the instructor for conferences at various times throughout the semester. After one such conference, the writer made the following notation in his anecdotal record.

> All Tuesday afternoon, I met with groups of students from Group I. Two of the poorer students did not show; one lived in the country and did not bother, the other had to work. The ostensible purpose was to go over Problem II with the group and review those points which they did not understand. The real purpose was to give members of the group additional practice in the critical thinking skills in small groups. The time was spent reviewing analyses of the readings and relating these to an overall theme, e.g. the understanding of the conflict between religious and temporal authority and the struggle to maintain individual liberty in such a static society. I also wanted to see if such an effort would have any effect on achievement on the test which was scheduled for the last of the

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[48] Cooper, op. cit., p. 254.

[49] Infra, pp. 98-104.

> week. Judging by the student reaction, it was a very profitable afternoon. One of the students said upon leaving, "Why couldn't all of our college classes be conducted in this way?"[50]

In achieving the specific goals of the course and the general goal as well, these small discussion techniques emphasized in the experimental group proved advantageous. For instance, the mean score of the "C" group was considerably higher than group "B" on Unit II.[51]

The reciprocal nature of the learning factor might well serve as the capstone to the characteristics previously described. Apparently the "C" group was made more fully a part of the learning process in all of these characteristics.

The setting up of these two groups seemed to substantiate one of Cantor's contentions, that is, "that the teacher has it within his power to establish the feeling tone of the classroom.[52] Relations between the instructor and the experimental group were of such a nature that the students did not hesitate to question or challenge one another, or the instructor, and in the process contributed to the impact of the learning situation on the group.[53] This give and take was lacking from the control group, except in an incidental manner. Responses on an unsigned questionnaire "Student Reaction To Classroom Teaching" supports this conclusion.[54]

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[50] Instructor's anecdotal report, November 20, 1958, Unit II.

[51] Infra, p. 93, Table 9.

[52] Cantor, op. cit., p. 79.

[53] Ibid., p. 80.

[54] Infra, pp. 100-101, Table 12.

Students in the "C" group felt that they had greater freedom to think, to ask questions or investigate, and they accepted a greater responsibility to contribute both to the group and to their own learning progress. This was the matrix in which group "C" operated, one in which a positive learning atmosphere was encouraged in the classroom, and evidently present in extra-class situations as well.[55]

Summary

This chapter has considered the application of the theoretical framework described in Chapter II to actual classroom situations at Greenville College.

The identification of the classroom situations was expedited by using the criteria of the various positions which had been posited along the ideal-type construct of learning experiences. The presence or absence of the various criteria was determined by describing the required American History classes prior to 1958-1959, and the distinctive methods used with the control and experimental groups within a single History of Civilization class.

The writer depicted the procedures of these three class situations using a number of illustrations and sources as evidence. These were observations of the instructor from his daily anecdotal record, course outlines, student rating sheets, student participation in out-of-class activities, and the organization and selection of

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[55]Cantor, op. cit., p. 80.

the total experiences within the various learning circumstances.

Using the criteria outlined in Chapter II, the writer derived the hypothesis that significant differences in achievement of critical thinking should take place in the various classroom situations.

In the subsequent chapter, the results gained in these actual classroom situations will be analyzed to check this hypothesis and to delineate those learning experiences which seem to result in the significant attainment of this objective.

CHAPTER IV

THE FINDINGS EVALUATED IN TERMS OF THE RELEVANCE OF THE LEARNING SITUATIONS TO THE ACHIEVEMENT OF THE OBJECTIVE

Introduction

The concern of this chapter is the evaluation of results realized in the various groups identified along the learning continuum. It is an assumption of this study that the achievement of the different groups can be related to the characteristics of the three positions described previously, and that this can best be done using data of a more or less subjective nature, e.g. interviews, rating scales, observations of the instructor, and scores on unit and final examinations. The writer feels that such evaluation should be more valid than objective data obtained on pre-test and post-tests of so called standardized tests. It is hoped that it will thus be possible to identify those learning processes and techniques which seemed to result in the greatest gain in the objective of critical thinking.

To more effectively evaluate in this way, it was necessary to control the instructor variable. This was possible since the "B" and "C" groups were included in the same class and the instructor had taught the classes in American History from which the freshmen in

the "A" learning situation were drawn. It was thus possible for the instructor, by using such observations, to check the hypotheses of this thesis. The first hypothesis was that the addition of certain minimum characteristics to the organization of the learning situation would result in a greater degree of achievement in critical thinking than could be attributable to chance. In order to maximize the achievement of critical thinking, the writer postulated that greater stress on these characteristics would be necessary as well as the addition of the "C" characteristics. It is further hoped that a comparative analysis of achievement in the three learning situations will enable an evaluation of those specific learning experiences contributing to such gains. Thus it should be possible to relate achievement in the desired behavioral objective to those methods which seem to facilitate its highest achievement.

The writer's contention is that such subjective evaluative devices together with observations used by the instructor, proved more helpful in performing this analysis than objective data. However, some attention will be given to information of the objective type. In the rather brief analysis of objective data, the fifty-two item "Test of Critical Thinking Form G" will be used. This device was used because it was designed to measure critical thinking abilities in general[1] and we were interested in the transferability of these skills to other areas than the social science field. The

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[1]This test was one of those developed by the A.C.E. Cooperative Study. Normative data is given in Appendix B. For a further description of. Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., pp. 174-207.

freshmen for 1957-1958 had already been given a pre and post-test of this form as a part of the Illinois Colleges Study, and it would be given to all freshmen in 1958-1959. This was another factor in favor of utilizing such data. The S.T.E.P. Social Studies Test Level 1A had been given to the freshmen as a part of their orientation week battery, so the writer administered a post-test in May 1959.

Achievement of Critical Thinking By Freshmen In the Required American History Classes

The "A" Classroom

An analysis of the gains made by students taking this course with those freshmen who had not taken American History in that academic year showed that the mean gain was somewhat higher than that of those in the "A" classes.[2]

Reference has been made to the general agreement among numerous writers regarding the relationship in practice in the behaviors sought and progress in those behaviors.[3] Another study by Glaser, earlier than those cited, contends that this is particularly so regarding the critical thinking objective.[4] American History had been included in the general education requirements largely because it was a statutory law that all public school teachers in Illinois

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[2]Mean gain for freshmen, not in American History = 5.66, for those in the "A" situation 2.66, the difference being 3.07. Since our concern is with a comparison of "A", "B", and "C" groups, we shall not attempt further analysis of the cause for these differences.

[3]Supra, p. 34.

[4]E. M. Glaser, An Experiment In the Development of Critical Thinking,(Teacher's College, Columbia University Press, 1941), passim.

have such a course. The assumption is that factual knowledge of our country's heritage would result in teachers who would be better citizens and thus teach citizenship by example. It is not our intent to point out the fallacy of such a law. Yet, even though this course was well organized around content-centered goals, it did not provide for practice in the application of knowledge to contemporary problems which was undoubtedly the purpose of such a requirement. Although the course listed critical thinking as one of its objectives, the reaction of upper classmen who had taken the course as freshmen was negative when asked, "Did the course stimulate independent thinking?" Only a small percentage of those responses agreed that it "stimulated them to think beyond the limits of the course materials."[5]

Neither did the course appeal to the interests of the students. For it was ranked last by the same students when asked "how effective was the course in stimulating interest?"[6] The failure of the course to make an impact on the social attitudes of the students might likewise be indicative of the absence of motivation to think and apply knowledge to contemporary social problems. The Inventory of Beliefs was given to a number of these students and a group of them were given a post-test in the spring of 1958. The mean score of the group given the post-test was slightly lower than the

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[5]Curriculum Evaluation Questionnaire, items 16-20. cf. p. 100, Table 12.

[6]Curriculum Evaluation Questionnaire, items 1-5.

pre-test.[7] The writer feels that this failure to respond suggests that student motivation, one of the characteristics basic to the minimum organization of learning experiences for the achievement of critical thinking, was absent.

A "survey" of student achievement toward the stated general education objectives in social science courses was the focus of an "honors" study in 1958-1959. Levi's "Inventory of Social Understanding"[8] was brought up to date and adapted for this purpose. The mean for the "A" group on the "Survey of Social Understanding" was several points below that of the "B" and "C" groups.[9] Such evidence seems to support the contention of the writer, that learning experiences in the required American History class emphasized coverage of content rather than the achievement of critical thinking, even though this was one of the stated objectives.

Comparative Analysis of Achievement of Critical Thinking In the Various Classroom Situations

The primary task of this chapter, and this thesis, is to make a comparative analysis of three different learning situations

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[7]Pre-test mean 59.7, post-test 58.4; difference in means = -1.3. Infra, p. Table 10 for comparison with "B" and "C" groups on this inventory.

[8]A. Levi, General Education In the Social Studies (Washington, D.C.: American Council On Education, 1948), Appendix pp. 325-336.

[9]This survey was adapted and administered by James Moody, a senior Social Science major, to students who had taken freshman social science courses in 1957-1958 and 1958-1959. The mean for freshmen from the History of Civilization course was 46.5 compared with 41.6 for the "A" group.

and the achievement toward desired behavioral changes of similar or nearly equal students in these learning situations. If the students are sufficiently equated, and their attainment of the goals varies from group to group, then it would seem possible to relate the differences in achievement to characteristics present in the learning situation in which the greatest gain was achieved. After a cursory look at objective data, we will more carefully evaluate the three groups using numerous other types of information.

Evaluation of Achievement Using a "Test of Critical Thinking Form G"

The freshman class of 1957-1958 had been given "Form G" in September and the post-test was given in mid-May. Forty-nine of these students had enrolled in the two American History classes taught by the writer. Freshmen in the History of Civilization class in 1958-1959 likewise had taken the pre-test in mid-September and the post-test in mid-April. The pre- and post-test mean scores, sigmas and mean gains, are compared in Table 1. Although the "B" group had a pre-test mean which was slightly higher, it still showed a gain which was significant at less than the .05 per cent level. It should be observed that the same students are included in the pre- and post-test results given. This comparison suggests that the control group in the History of Civilization class, statistically at least, approached the "B" criteria.

The experimental group was likewise compared with the control group. If the "B" characteristics resulted in the difference between

TABLE 1

COMPARISON OF MEAN PRE- AND POST-TEST AND IMPROVEMENT SCORES ON THE "TEST OF CRITICAL THINKING FORM G" FOR STUDENTS IN THE "A" AND "B" LEARNING SITUATIONS[a]

Classes	N	Pre-Test		Post-Test		Gain		Level of Significance	
		Mean	SD	Mean	SD	Mean	SD	t	P
Freshman Amer. History "A" Position Sept. 1957-June 1958	49	28.95	6.67	31.55	6.67	2.59	1.94		
History of Civ. Control Grp. "B" Position Sept. 1958-June 1959	12	29.25	6.79	34.17	6.95	4.92	3.23		
Difference between "A" and "B" classes								2.225	.05[b]

[a]To find the significance of difference between the gains of these two groups, the statistical procedure for the test of significance was taken from A. L. Edwards, Statistical Methods For the Behavioral Sciences (New York: Rinehart and Co., Inc., 1956), p. 254.

[b]For the degrees of freedom in this test of significance, t should equal 2.660 to achieve significance at the .01 level, Ibid., p. 501, Table 5.

"A" and "B", would greater stress on these and the present of additional characteristics show similar improvement? In other words, would learning situations organized to meet the "C" criteria result in maximum achievement of critical thinking as measured by the A.C.E. Test of Critical Thinking Form G? The small number of cases in the group made a comparison of pre- and post-test data on this test seem

of doubtful value.[10] A comparison was made of the significance of the difference between the control group ("B") and the experimental ("C") group in the History of Civilization. The results are given in Table 2.

TABLE 2

COMPARISON OF MEAN IMPROVEMENT SCORES ON "TEST OF CRITICAL THINKING FORM G" FOR THE "B" AND "C" LEARNING SITUATIONS[a]

	Mean	S.D.	t	P
"B" Position (N = 12)	4.9166	3.23		
"C" Position (N = 10)	8.7	4.69		
Difference between "B" and "C" Positions			2.127	.05

[a]For the degrees of freedom in this test of significance t should equal 2.845 to achieve significance at the .01 level of confidence and 2.528 equals the .02 level, Edwards, op. cit., p. 501, Table 5.

The results of the comparison in Table 2 tend to support the writer's hypothesis that significance difference in the achievement of critical thinking should occur between the control and experimental groups if the "B" and "C" criteria are met. The difference between the two is significant at slightly less than the .05 level

[10]A t test comparing the pre and post-test results gave a t-score of 3.63 which was significant at the .01 level.

of confidence.[11]

Since the differences of critical thinking achievements in the three learning situations was considered crucial to the study, a further check using analysis of variance was used for this purpose.

The three groups were approximately equal in their critical abilities according to the pre-test mean scores. The comparison of data used in the analysis of variance of the mean gain of the three groups is given in Table 3.

TABLE 3

COMPARISON OF THE PRE-TEST AND POST-TEST MEANS OF "A", "B", AND "C" LEARNING SITUATIONS ON "FORM G"

	American History the "A" Position	Control Group History of Civilization "B" Position	Experimental Grp. Hist. of Civ. "C" Posit.
N	49	12	10
Pre-test score	28.96	29.25	30.8
S.D.	6.67	6.80	6.
Post-test score	31.55	34.17	39.3
S.D.	6.67	6.95	5.80

The analysis of variance data testing the significance of difference in the mean gain of the three groups is shown in Table 4. The results are well beyond the one per cent level, which seems to support the writer's contention that the presence or absence of the

[11] In Table 2, t should equal 2.086 to achieve significance at the .05 level of confidence. Edwards, op. cit., p. 501.

characteristics described in Chapters II and III should affect the achievement of critical thinking.

TABLE 4

ANALYSIS OF VARIANCE OF ACHIEVEMENT OF THE THREE GROUPS ON A "TEST OF CRITICAL THINKING FORM G"[a]

Source of Variation	Sum of Squares	df	Mean Square
Between groups	326.4423	2	163.2212
Within groups	1100.8535	68	16.1898
Total	1427.2958	70	

$$F = \frac{163.2212}{16.1898} = 10.08 \qquad P \quad .01^{a}$$

[a]For the degree of freedom in this analysis of variance problem, the F result should equal 4.95 in order to achieve significance at the .01 level, Edwards, op. cit., pp. 315-322, 504-508, Table 8.

The A.C.E. Cooperative Study noted a "recurring pattern of association of large gains with low pre-test scores and small gains with high pre-test scores.[12] An attempt was made to check whether this was true of any or all of the three groups.

The pre-test scores of the three positions were divided on the basis of normative information given in the "Instructor's Manual."[13] The division used was high (34 and above), average (24-33), and low (23 and below). The "A" group did not follow the "pattern" referred

[12]Dressel and Mayhew, op. cit., pp. 247-248.

[13]Instructor's Manual For the Test of Critical Thinking Form G, Committee on Measurement and Evaluation, Cooperative Study of Evaluation In General Education of the American Council On Education (Michigan State University, 1953), pp. 12-13. (mimeographed)

to for some unexplainable reason. The "B" group did, however, but as Table 5 shows, the mean gain for the high group was 2.4 above that of the "A" position. The table shows that the "C" group had a higher gain in the high and average classifications, although the results were skewed by one case gaining 20 points in the low.

TABLE 5

COMPARATIVE MEAN GAIN ON "FORM G" OF LOW, AVERAGE AND HIGH GROUPS OF STUDENTS IN THE "A", "B", AND "C" POSITIONS

Groups	Classifications		
	Low	Average	High
"A" Criteria	2.6	2.6	2.6
"B" Criteria	7.33	3.4	5.
"C" Criteria	20.	8.33	6.33

The improvement of the "B" and "C" groups over the "A" could be ascribed to the additional characteristics included in each. Since the mean gain for the high, low, and average scores in the "A" group was static, group "A" does not follow the pattern but group "B" does.[14]

Achievement On the S.T.E.P. Social Studies Test

Achievement of results which are statistically significant in the important objective of critical thinking is of consequence,

[14] Supra, Chapter III for description and application of the "C" characteristics.

but attainment in all the related general education objectives was hoped for by the writer and expected by the administration of the college. To check on such performance the experimental and control groups were given pre- and post-tests on the "S.T.E.P. Social Studies, Form 1A." Since this test had not been given to the "A" group until May of 1958, comparative data on the respective post-test gains for the three groups were not possible. As tenuous as a comparison of the spring test of the three groups would seem, it might be of interest to make such an analysis. Table 6 is an attempt to compare the "A" group with both groups in the History of Civilization class.

TABLE 6

MEAN SCORES ON S.T.E.P. SOCIAL STUDIES 1A, SPRING TESTING, COMPARING "A" WITH "B" AND "C" POSITIONS

Classes	Mean	S.D.	Percentile Band (Grade 14)
American History Position "A" (N = 46)	39.89	8.18	43-65
History of Civilization (N = 21)	44.57	9.18	59-82
Difference in means	4.68		

Although comparative data on pre-test scores were lacking, making it impossible to compare the achievement of the History of Civilization class with the previous required class, it is rather

obvious that freshmen taking History of Civilization were in a higher percentile band after approximately a year of college than freshmen who had taken American History. This is perhaps a more valid comparison than grades earned in the two classes, for in the American History classes freshmen were in the minority. This meant that they would be ranked with upper-classmen and sophomores relative to achievement within the class while on the S.T.E.P. test they were compared with other freshmen on which the normative data had been compiled.

Table 7 shows a slightly greater gain for the "C" group over the "B" group, but since the t value was only .56 for 19 degrees of freedom, it would appear that the null hypothesis is correct. Yet the higher pre-test scores should be considered as affecting the gain of the "C" group and the more consistent achievement on the post-test needs to be noted. The two groups appear to be statistically similar in gains on this test; however, the "C" group started with a higher score and so perhaps in terms of percentage of possible gain, theirs was greater than the "B" group.[15]

It would seem safe to conclude that students in the two groups in History of Civilization ended the year, on the average, with a slight edge over the freshmen of the previous year in those skills and understandings measured by this test. In other words, the greater gains in critical thinking achievement were not attained at

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[15]Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., pp. 247-248.

the expense of other important goals, such as social science understandings. Although there was not a significant difference in achievement on this general social studies test, we shall see that group "C" was consistently ahead of the other two groups in terms of achievement of the particular aims of the class as shown by tests and final grades.

TABLE 7

"B" AND "C" LEARNING SITUATIONS COMPARED ON S.T.E.P. SOCIAL STUDIES FORM 1A

		Pre-Test			Post-Test				
Classes	N	Mean	S.D.	%ile Band	Mean	S.D.	%ile Band	Mean	S.D.
"B" Grp.	11	38.18	9.33	40-62	41.27	9.85	54-78	3.09	4.21
"C" Grp.	10	44.	9.44	62-84	48.2	6.94	73-90	4.20	4.42
Difference Between "B" and "C" groups		5.22			6.93			1.11	

t = .56
P = .6

Relationship Of Grades To Achievement

In Critical Thinking

In the final analysis it is the individual instructor who observes and judges the development of the student toward previously agreed on goals. Final grades should represent the accumulation of a number of such observations and judgments. Particularly should this be true of the "B" and "C" situations, although to a lesser

extent in the former, where the class was small and the instructor was desirous of stressing student motivation and the other characteristics which we have agreed should be present.[16] The writer assumed that there should be a greater relationship between the students final grades and his performance on the critical thinking test in the "B" and "C" positions than in the "A" group. The overall emphasis on the objective of critical thinking in freshman classes as a result of the Illinois Study, the stress on the identification and stimulation of the able or superior student at Greenville College,[17] as well as the organization of learning experiences in the two groups, is no doubt reflected in the greater relationship of grades to critical thinking as shown in Table 8.

TABLE 8

RELATION OF FIRST SEMESTER GRADES TO MEAN GAINS ON THE "TEST OF CRITICAL THINKING FORM G" COMPARED BY GRADE RANK

Semester Grades In the Three Positions	American History 1957-1958 Position "A"	History of Civilization 1958-1959 "B" and "C"	History of Civilization Position "B"	History of Civilization Position "C"
A	1.3	7.3	-	7.3
B	4.7	9.1	6.3	10.4
C	2.5	4.7	4.1	4.
D	2.3	1.6	2.	1.
F	2.4	3.	3.	-

[16] Supra, Chapter II and III.

[17] "In 1957 Greenville College received a grant from the Danforth Foundation for the purpose of developing a program which would provide opportunity for students of higher academic aptitudes to engage in studies which might help them approach their maximum in

Evidently there was greater achievement realized in critical thinking gains by the "B" and "C" students than the "A" students. Perhaps it would be safe to conclude that the organization of this former class was aimed at the average student and consequently the more able students were not challenged.[18] The small number of students in groups "B" and "C" made a three-way comparison difficult so we combined them in the second column in Table 8. It should be noted that there were an equal number of students receiving A's in both classes among the freshmen. The gain was greater for the 1958-1959 group, although their pre-test mean was 36 compared with 34.5 for the 1957-1958 group. There was thus a greater relationship of achievement as shown in earned grades to achievement in critical thinking in History of Civilization than in American History, and this relationship was still greater in comparing the experimental group with the control group within the History of Civilization course.

The superiority in achievement of the "C" over the "B" group is illustrated by a comparison of the four unit tests and the final semester comprehensive examination given in Table 9. These were mainly objective type tests stressing understandings, and the applications of critical thinking skills practiced in class to different situations. It should be noted that the two groups were

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scholarly achievement." This program was begun in 1958-1959 under the direction of Dr. E. L. Lyle. "First Annual Report To the Danforth Foundation On Independent Study For the Superior Student at Greenville College, pp. 27-30. (mimeographed)

[18] Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., p. 248.

equal on the A.C.E. Psychological Examination and not significantly different on the S.T.E.P. pre-test.[19] Yet the difference between the mean scores of the two groups increased in favor of the "C" group as the semester progressed. Part of the distinctive treatment accorded the "C" group related to the correction of such tests by the instructor. If the student missed multiple choice type items, a notation was made by the correct response telling why it was the correct item and referring to similar cases or problems discussed in class to an interpretation and application of a particular reading arrived at by the class.

TABLE 9

COMPARISON OF ACHIEVEMENT OF MEAN SCORES OF "B" AND "C" STUDENTS ON UNIT TESTS AND SEMESTER FINAL IN HISTORY OF CIVILIZATION

Classes	Unit I	Unit II	Unit III	Sem. Final & Unit IV	Total All Tests
"B" Group (12 cases)	43.7	17.	27.	89.	176.7
"C" Group (12 cases)	50.5	22.	35.	104.6	212.1
Difference between means of the two groups	6.8	5.	8.	15.6	35.4

Usually there was at least one brief essay question and corrections and comments were carefully written on these. If the

[19] Supra, p. 90, Table 7.

student confused underlying assumptions and arguments, this was pointed out; or if he failed to carefully state reasons for accepting a conclusion or argument, this likewise was indicated. This usually meant that their papers were graded more severely, yet a majority responded with a positive effort to this challenge, and on the final when they had a choice of answering fifteen true-false questions or analyzing the film "Martin Luther", a majority of the "C" group chose the latter, but only one or two of the "B" group took this option. This consistent superiority in achievement of the "C" group seems to represent a greater response to the positive tone of the learning situation and a desire to achieve the objectives which the group had mutually agreed were important.

Comparative Achievement of the Three Learning Situations On Social Attitudes and Understandings

In addition to the concrete examples of student achievement in the cognitive area, the relative impact of such courses in the realm of values is of consequence in planning and evaluating a general education curriculum. Jacob's study states that "objective evaluation of the outcomes of specific courses in social science ... indicates that they too rarely exert a distinctive impact on student attitudes.[20] He concedes however, that "some social science courses have been more effective in this regard than others. And he suggests

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[20]Philip E. Jacob, Changing Values In College, An Exploratory Study of the Impact of College Teaching (New York: Harper and Brothers, 1957), p. 58.

that the testimony of students who have had such reorientation of values together with objective indices of these changes have shown that some students have tended to become more liberal in their attitude on social and economic issues."[21]

To the extent that the "C" group developed more positive attitudes toward such problems, it achieved to a greater degree one of the behavioral objectives of a general education course.[22]

The three groups showed a significant difference in the mean gain on the "Inventory of Beliefs." Pre- and post-test data had been obtained on only a small group from the "A" learning situation and this was not necessarily a random sample of the forty-nine cases in that group. Nevertheless, there would appear to be some value in comparing mean improvement on the Inventory of Beliefs. The ten cases had a higher mean percentile on the A.C.E. Psychological Examination (72 as compared with 54 for the total "A" group), and their grade point average was higher also (2.69 compared to 2.44 for total group).

Although their pre-test scores and mean gain appeared to be similar to the total "A" group on the "Test of Critical Thinking" (31.2 compared to 31.55 and 2.4 vs 2.59), yet statistical analysis of this more or less selective sample showed significant difference in mean improvement scores of the "C" group compared to this group

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[21] Ibid., p. 72.

[22] Instructors Manual for the Inventory of Beliefs, The American Council On Education, Committee On Measurement and Evaluation (Michigan State University, 1953), p. 4. (mimeographed)

and that of the "B" group.[23] The mean difference between pre- and post-test on the Inventory of Beliefs was -1.3 for "A", -.02 for "B" and 9.3 for "C"; the sigmas were 7.19, 6.45 and 13.81 respectively.

The analysis of variance data testing the difference between these scores is given in Table 10. Since the F test was significant between the .01 and .05 levels of confidence, this analysis suggests that on the data used, the "C" learning situation was the only one showing important development of attitudes as measured on this inventory.

TABLE 10

ANALYSIS OF VARIANCE OF MEAN IMPROVEMENT SCORES OF THE THREE LEARNING SITUATIONS ON THE "INVENTORY OF BELIEFS"

Source of Variation	Sum of Squares	df	Mean Square
Between groups	702.867	2	351.433
Within groups	1956.600	27	72.466
Total	2659.467	29	

$$F = \frac{351.433}{72.466} = 4.85 \qquad P \quad .05^{a}$$

[a]For the degree of freedom in this analysis of variance problem, the F results should equal 5.49 to achieve significance at the .01 level or 3.35 to achieve significance at the .05 level. Edwards, op. cit., p. 506, Table 8.

[23]The Inventory of Beliefs had been given to a section of American History and the post-test was administered with the final examination in the spring. The examination took most of the period for most of the students and so the Inventory was only given to those who had finished with considerable time. This was a select group as only three had a G.P.A. below B-.

The Social Science Survey, developed as part of an "honors" project,[24] provided a further check on students' attitudes toward political, economic and social problems of national and international importance. This survey was used to compare sophomores who had taken their social science requirements in 1957-1958 with freshmen who were taking these requirements in 1958-1959. It was found that the mean for the "A" group on this survey was about the same as that of sophomores who had not taken any social science.[25] (41.6 for 20 sophomores who had taken American History compared to 42 for those who had not taken social science) The mean score for the 12 freshmen in the "B" group was 43 compared to a mean score for freshmen without a social science course, of 40. The "C" group had a mean score of 48.6 as contrasted with a mean of 40 for freshmen not taking any social science or an advantage of 8.6 plus a difference of 7.1 between it and the "B" group.

The positive results in favor of the "C" group seem to have been validated by the results obtained by this group on the Inventory of Beliefs.[26] It would seem safe to generalize from this data by concluding that the "C" group demonstrated a greater degree of awareness of significant contemporary problems than the students in the other groups.

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[24] Supra, p. 81.

[25] In the case of specialized curricula, e.g. music and pre-engineering, social science requirements are sometimes put off until the junior year.

[26] Supra, p. 96, Table 10.

Comparison of the Various Learning Situations Using Student Responses As Indices of Achievement of Critical Thinking

There are a number of other tangible results which demonstrate the greater viability of the course objectives to the "C" group than to the other groups. These can be demonstrated by an analysis of class attendance, final grades, completion of assignments, student interest, and awareness of progress in the desired behavior and student evaluation of the course as compared with other general education courses.

Absenteeism was rare in the experimental group in History of Civilization. In the sixteen weeks of classes, there were only ten absences or less than one per student for the semester. The control group averaged slightly over one per student for the semester for a total of thirteen and the "A" group with a total of 96 absences averaged nearly two absences per student. This difference no doubt was affected by the "flu" rate which closed school for nearly a week, but the instructor was aware of a number of absences caused by students staying out of class to "cram" for a test in another course. There were no known absences for such reasons in the "C" group.

Although learning experiences were of a different nature in the "A" group, than in the other two, yet there were weekly assigned reading reports required on which they were to identify the central theme and the underlying assumption of the reading. The History of Civilization class did much better at assignments of this nature,

probably because these readings were analyzed as a part of the class procedure in that class, whereas in American History they were seldom discussed, but were graded and handed back without any written comments. In the History of Civilization class the type and number of assignments were the same but the "C" group made marked progress in terms of recognizing central issues, underlying assumptions, and in evaluating arguments and deciding whether the conclusions of the readings were warranted or unwarranted. The quantity or number of assignments completed in the "C" group was superior to the "B" group, as well as the quality.

A general index of the positive attitude of the "C" group toward the stimulus value of History of Civilization courses is suggested by Table 11. The fact that this interest was sustained is shown by the number of first semester students who participated in independent study for course honors the second semester. Of the ten students from a class of forty-two, seven were from the first semester, and five of these had been members of the "C" group.[27]

TABLE 11

INTEREST IN HISTORY OF CIVILIZATION COMPARED WITH OTHER REQUIRED FRESHMAN COURSES AS SHOWN BY PER CENT OF "B" AND "C" GROUPS APPROVING EACH

Course	"B"	"C"
History of Civilization	40%	75%
Communications	35%	13-2/3%
Biological Science	25%	11-1/3%

[27]This was work over and beyond their grade for the course, which would be planned in individual conferences with the instructor,

Students in the "C" group ranked History of Civilization first as compared to other general education courses when asked "which of the courses stimulated the greatest degree of independent thinking?"[28] The reactions of the three groups to this questionnaire are compared in Table 12.

TABLE 12

STUDENT EVALUATION OF COMPARATIVE VALUE OF THE REQUIRED COURSES IN STIMULATING INDEPENDENT THINKING PER CENT OF GROUPS APPROVING EACH[a]

Course	"A"	"B"	"C"
American History	15	-	-
Humanities	46	-	-
Biological Science	17	33%	13%
Communications	10	16%	0
Physical Science	22	-	-
History of Civilization	-	51%	87%

[a]The Humanities and Physical Science courses are almost always taken the sophomore year.

Since transferability of learned behavior is pertinent to the objectives of a general education course, the response of the students to the question "which course has the most carry over value into out-of-class activities?" is significant. The "A" group ranked their experiences in American History fourth in this category; group "B" ranked History of Civilization third; while group "C" ranked it

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and would include regular progress reports every other week. No credit was given but the term course honors was appended to their grade.

[28]Curriculum Evaluation Questionnaire, items 16-20.

first among all the required courses in general education which they had taken in their freshman year.[29] The validity of these ratings is heightened when the fact that all the freshman courses were emphasizing the critical thinking objective as participants in the Illinois Colleges Study on the Teaching of Critical Thinking is noted.

Unsigned teacher and classroom rating sheets[30] were passed out in one of the last classes of the first semester of each course. A summary of these responses shows that 80-90% of the "C" students rated the instructor very favorable as compared to 33-55% of the "B" group. The variety of responses in the different groups to the check list of specific suggestions, for the course or instructor, indicates a variety of forces operative in the three learning situations which obviously affected achievement. Sixty-seven per cent of group "A" checked the suggestion that "the material should be presented more slowly;" thirty per cent that "the instructor should use more visual aids;" thirty-six per cent checked "students should be encouraged to participate more in class discussions." Of the students in group "B", seventy-five per cent checked that "students should be encouraged to participate more in class discussion.[31] Only nine per cent of the "B" students felt that grading

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[29]Curriculum Evaluation Questionnaire, items 31-35.

[30]"Student Reaction To Classroom Teaching" developed for Greenville College by Dean George T. Tade.

[31]In a typical four weeks period the average voluntary participation was 1.7 times per class period for "B" group compared with an average of 10.7 per class for group "C". "Anecdotal Report Student Observer", October 27, 1958.

policies were unusually fair, as opposed to seventy per cent of the "C" group. Evidently History of Civilization was not considered a "snap" course by the "C" group, for sixty-six per cent or 8 of 12 checked that they did "more than average the amount of work for the number of credits" as compared with only twenty per cent of the twelve students in the "B" group.

However, on the question, "What is the feeling between the teacher and the student?", fifty-eight per cent of the control group checked "extremely friendly in and out of class," as compared to forty per cent for the American History group in 1957-1958 and ninety per cent for the "C" group in History of Civilization. On item 9, "Do you feel you can get personal help in this course if you need it?" twenty per cent of both the "A" and "B" groups agreed that they "could get a great deal of personal help if needed" as compared to seventy-three per cent for the "C" group. Forty per cent of the "B" group checked the statement, "I would like to get better acquainted with the instructor" as compared with twenty per cent of the "A" group and nineteen per cent of the "C" group.

There was one item on which there was not a strong consensus, item 8, "How clearly are your responsibilities in this course defined?" Group "B" was divided between "usually" and "have a general idea," and the "C" group likewise except for three students who checked "always know what is expected of me." There was a general tendency to rate both the course and the instructor high on these rating sheets. And it was the student's positive attitude toward the

organization of learning experiences; toward the instructor, and the materials selected; and the classroom "atmosphere" which seemed to have been crucial to the greater advances toward the objective of critical thinking made by the students in the "C" learning situation.

Specific Learning Experiences Which Seem Related To the Attainment of Critical Thinking By the "C" Group

The significant difference in the achievement of critical thinking by the "C" learning situation suggests that the methods utilized should have contributed to this growth. In Chapter II, where the application of the learning situations was described and in this chapter, three or four characteristics have been identified, which are necessary if the maximum achievement of the objective is to be reached.

The stress on student motivation in both the "B" and "C" groups seems to have been basic to growth in the objective. It is generally accepted as axiomatic that without some form of motivation, no learning would take place, but the writer is concerned with that form of motivation whereby the organization of learning experiences is consciously focused on the interest, attitudes and purposes of the individual student.[32]

At least one well known historian has stated that "in learning history it is better for a student to be impelled by his

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[32]T. R. McConnell, "Reconciliation of Learning Theories," Forty-first Yearbook of the NSSE, Part II, op. cit., p. 263.

own interests than by the teachers."[33] An example of the use of attitudes in the "B" and "C" learning situations was the discussion of the "impact of Christianity on history," as a prelude to the problem which used materials from the medieval period. The instructor had discovered that all students in both groups had strong religious interests, but one of the better students in the "C" group had a negative attitude toward anything that was related to the medieval period. So the class spent a week discussing the ideas of St. Paul and Augustine as a foundation for this epoch. This resulted in a decrease of this student's negative attitude toward a problem which the group had decided to discuss, as well as emphasizing the background for the problem of "conflict of authority," in the Middle Ages.

The use of small discussion groups, in and out of class, combined with the variety of experiences provided for the "C" group seemed to enhance the attainment of the objective. It would seem that the number in the class is not as significant as what Cantor termed "the student's perception of his self and situation in the learning process."[34] For as a whole, the "C" group identified themselves with the learning situation. This is not to say that everyone in the "B" group failed to do this, nor that everyone in the "C" group succeeded. But, this personal emphasis in the learning situation is essential if general education courses are to

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[33]Gottschalk, op. cit., p. 173.

[34]Cantor, op. cit., p. 79.

provide for the uniqueness of each individual and provide him with the opportunity to develop his particular interests, faculties and potentialities within the framework of a prescribed general education curriculum.[35] Such opportunities are not guaranteed automatically with the reduction in numbers of students in the classroom, as the experience of the "B" group demonstrates.

The fourth method which seemed to contribute to the development of the ability to think independently, was the "reciprocal nature of the learning process." This includes the involvement of the teacher in the learning process. Time and again as the writer worked with the students, in the analysis and interpretation of the historical readings, he was forced to admit that an idea submitted was different than that which he had used in his analysis of the reading, or an application made was more meaningful than one he had been trying to suggest to the class. The instructor was not afraid to admit to himself, and to the students, that he had learned something from his students.[36] This reciprocal nature of the learning process is dependent on a positive, permissive attitude on the teacher's part. Cantor contends that this attitude "determines the spirit of the classroom, the matrix in which learning can take place."[37] When the teacher is secure enough to admit his errors rather than justify them, the student is helped to admit his

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[35]French, op. cit., pp. 92-93.

[36]Hulme in vonGrueningen, op. cit., pp. 93-95.

[37]Cantor, op. cit., p. 93.

limitations.[38]

These four methods: student motivation, used with both groups but stressed to a fuller extent with group "C"; an atmosphere characteristic of a small discussion class; a variety of experiences allowing for individual differences; and the reciprocal nature of the learning factor, seemed to be related to the achievement of the objective. Obviously they are overlapping methods and might well be summed up under what Sidney French and other writers term "the student centered" approach to general education.[39]

A description of the types of activities participated in by both "B" and "C" groups and which led to a minimum achievement of the objective has been given previously.[40] The evidence submitted in this chapter has shown that without the presence of the "C" criteria maximum results were not obtained.

Summary

The results gained by classes identified along the ideal-type construct of learning experiences have been discussed in this chapter.

Students in the three learning situations, identified by the various criteria, were given pre- and post-tests in the fifty-two item "Test of Critical Thinking Form G." The "B" and "C" groups

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[38] Ibid., p. 87.

[39] French, op. cit., pp. 13-15.

[40] Supra, pp. 55-62.

were also given pre- and post-tests on the S.T.E.P. Social Studies Test 1A.

Data from these tests suggested that the "B" group in the History of Civilization class achieved more than the "A" group, freshman students in American History in 1957-1958, and that the "C" group had achieved to a greater extent than the "B" group.

It was concluded that greater gains in critical thinking were made by the "C" group on the basis of observations made by the instructor, the testimony of students, grades on unit and final examinations, responses on teacher evaluation sheets, curriculum evaluation questionnaires, and improvement in attitudes as shown on pre- and post-test results of the Inventory of Beliefs.

These favorable results lend credence to the assertion that the objective of critical thinking can be most readily obtained in a "student-centered" learning situation. Implications of these findings will be discussed at length in Chapter V.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Critical Thinking Important As An Educational Goal In Our Contemporary Culture

In a society where the decision making process rests fundamentally in the citizens, rather than in a monolithic leadership, the need of having a citizenry trained in the application of critical thinking abilities to the "democratic decision making processes" is imperative. The history of mankind too often has shown the folly of separating scholarship from citizenship. Educators, politicians, and college students as well need to realize that scientific education and even scientific thinking is not sufficient for the survival of the present crises in our civilization. This scientific skill must be applied to social problems of common concern. The educated man or woman should be able to analyze the assumptions underlying the conflicting points of view[1] and rival ideologies so as to avoid the fallacy of one modern scientist-philosopher who suggested that the "West should give the Communists a monopoly on H-bombs and then the world would be safe and peaceful."[2]

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[1]Morse (ed.), op. cit., pp. 101-103.

[2]Bertrand Russell, quoted by Dr. William Yardley Elliot in an address at The Principia College Public Affairs Conference, April 18, 1959.

Over the past decade or so educational literature has been replete with discussions of the value and need of stressing the objective of critical thinking. The President's Commission For Higher Education indicated the need of a common objective around which to integrate the purposes and values of our educational system.[3] And world and national leaders have emphasized the need of training in the "decision making process."[4] And probably every institution of higher learning in America states as one of its principle objectives, the development of independent or analytical thinking.[5] And, most philosophies of education support the idea that students should be trained in the ability to think and that the end result would be that they would be able to think for themselves.[6]

Teaching Critical Thinking Is Needed In the Liberal Arts College General Education Social Science Curriculum

The Social Science Committee of the Cooperative Study of Evaluation found that "most social scientists agree that the ability to think about social, political and economic issues clearly, critically and on the basis of the best available information, is a

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[3]Higher Education For American Democracy, op. cit., p. 103.

[4]Supra, pp. 2-4.

[5]Mayhew, editorial in North Central News Bulletin, op. cit., p. 1.

[6]C. R. Miller, "Critical Thinking," Childhood Education, XVI, p. 196.

desirable educational objective.[7]

The writer has noted recent trends which in addition to the crises of western society, suggested the importance of critical thinking as an objective in a History of Civilization course in the liberal arts college.[8] These trends are: a wide agreement among educators to broaden objectives to include critical intelligence as well as understanding; recognition of the lack of critical thinking abilities by college students; a trend toward broad divisional type courses in the liberal arts college; a trend to measure the achievement of these educational goals in terms of the higher mental processes; and, inter-institutional studies of the most effective means of attaining this objective.

In spite of the great number of studies reported which discuss this objective, there have been few attempts to provide opportunities to practice the critical abilities in the typical classroom of the traditional liberal arts college.[9] And still fewer attempts have been made to evaluate the success of such methods and thus relate them to the achievement of critical thinking.[10]

The participating colleges in the "Illinois Liberal Arts Study On Critical Thinking" became more aware of the need for developing methods which would provide practice in this objective.

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[7]Dressel and Mayhew, Critical Thinking In Social Science, op. cit., p. V.

[8]Supra, pp. 4-7.

[9]Dressel and Mayhew, Critical Thinking In Social Science, op. cit., p. III.

[10]These are described in Appendix E.

General agreement regarding methods which should be conducive to such an objective was arrived at after a number of inter-college conferences in the years of 1955-1957.

In 1958-59 an inter-institutional attempt to apply these methods was made by three Illinois liberal arts colleges. Since Greenville was one of the cooperating schools, the writer was able to participate in this project. As nearly as possible classes were to be taught by the agreed methods. The fifty-two item "Test of Critical Thinking Form G" which "measures the ability of college students to demonstrate critical thinking skills"[11] was the primary device used to check on achievement of this objective. Anecdotal records of observations of the most effective methods used in the various classes were to be kept and reported every three weeks. This then was an attempt to bridge the gap which the A.C.E. study found existed between the definition of objectives and their evaluation.[12]

This thesis evolved out of the author's interest in the Illinois Study and out of a plan to develop a new general education course for the social science division of Greenville College using the objective of critical thinking as the integrating principle.[13]

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[11]The A.C.E. Committee On Measurement and Evaluation, Instructors Manual for the Test of Critical Thinking Form G, p. 4. Developed by the Cooperative Study of Evaluation in General Education, Michigan State University, 1953.

[12]Mayhew, loc. cit.

[13]Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., pp. 275-277.

Learning Experiences Developed To Attain the Maximum Achievement of Critical Thinking

It was decided that this would be basically a history of western civilization course, using the critical thinking skills in analyzing "unresolved" problems in history and applying the understandings arrived at to an analysis of contemporary social problems. In order to maximize the organization of the learning experiences to obtain this objective, emphasis was placed on the second and third steps of the four recommended by R. W. Tyler, i.e.:

1. Presentation of learning experiences which would allow the students practice in the defined behaviors of critical thinking (e.g. identifying the central issues, etc.)

2. Organizing these learning experiences so as to achieve the maximum cumulative effect. (e.g. providing for continuity and sequence from one learning experience to another)[14]

To accomplish this maximum cumulative effect suggested by Tyler, the writer adapted the theoretical formulations derived from the ideas of Weber, Judd, Tyler and Dewey by H. M. Chausow in a study of Critical Thinking In the Social Science Classes at Wright Junior College in 1953.[15] In his study, Chausow adapted Weber's ideal-type construct to educational experiences, and from the ideas of the other three he developed an organizational schema.

In the adaptation of the ideal-type construct to the description of learning experiences, three ideal positions were established along the learning continuum. They were the ineffective

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[14]Herrick and Tyler, op. cit., pp. 60-67.

[15]Chausow, op. cit., pp. 26-32.

organization of learning experiences, represented by the American History course as taught in 1957-1958; the minimum effective organization of learning experiences represented by the control group in the newly organized History of Civilization course and the most effective organization of learning experiences represented by the experimental group in the History of Civilization course.

The students in the "B" group were identified by the presence of the "B" criteria.[16] The "A" group was identified by the absence of or failure to use the "B" characteristics.[17] And the "C" position on the learning continuum was greater stress on the "B" criteria plus additional characteristics which placed greater emphasis on individual differences in the learning situation.[18]

The "B" and "C" characteristics were applied in the same class and by the same instructor. Thus it was possible to relate differences in achievement to the function and effect of the characteristics present in the learning situation. It was necessary to use various sources of evidence to check whether or not the particular characteristics were present or absent in the "B" or "C" situations within the History of Civilization classroom. The sources of evidence used for this purpose included questionnaires, student ratings of classroom situations and teacher, anecdotal records by the instructor and student assistant, interviews with members of the two groups in which their reactions to classroom experiences, tests, etc. were

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[16] Supra, p. 30, Chart I. [17] Ibid.

[18] Supra, p. 30, Chart I and pp. 103-105.

discussed, logs or notebooks kept by students, and comparison of all three groups on the Inventory of Beliefs and Social Science Survey, and participation in class and co-curricular activities related to the classroom, e.g. attendance at Little United Nations, etc.

The concept of the ideal-type construct assumed that greater achievement in critical thinking should take place as one moved from the "A" to the "C" learning situation. That is, while significant increase in critical thinking would not take place in the "A" group, this would be so in the "B" group. And students in the "C" group would have a greater gain than the "B" group.

An Organization Designed For Maximum Results

The ideal-type construct aided in identifying classroom situations and in checking on the hypothesis of the thesis. However, a design which would provide effective learning experiences for attaining maximum results in critical thinking was needed.

The ideas of Judd, Dewey and Tyler suggested such a design.[19] The concept of levels of thinking for such a course; e.g. from understandings, to applications, to generalizations; was furnished by Judd, Dewey's idea of interaction of learning experiences led to the idea of interaction of these three levels. And Tyler gave the emphasis of an organizational theory consisting of principles, threads or elements, and structures.

The theory basic to the organization of this study was that there would be constant interaction of historical understandings,

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[19] Supra, pp. 42-45. cf. Chausow, pp. 26-32.

their applications and greater emphasis on generalized knowledge as one proceeded from problem to problem. That is to say that development from historical understandings to generalizations about social science problems was to be utilized.

This organizational framework was used in both the "B" and "C" learning situations. However, the "C" group had greater opportunity to gain practice in the behaviors of critical thinking and were active in planning the problematic situations used. In the process of analyzing historical materials, the students were asked to identify the central theme, the underlying assumption, and to decide whether or not the arguments were valid or the conclusions warranted. After arriving at historical understandings as a result of such a process the students in the "C" group, together with the instructor, evolved specific contemporary problems to which the understandings arrived at were to be applied. A variety of learning experiences were used to aid the student in arriving at historical understandings. And in each problem unit the students applied the historical material to a contemporary problem. Students, largely from the "C" group, defined the problem in its contemporary frame of reference, discussed the validity and applicability of the arguments used by "great thinkers" in the readings, suggested a hypothesis for the problem and tried to agree on what was a warranted conclusion. The hypothesis was usually of a controversial nature and resulted in a variety of conclusions. An analysis of the basic assumptions underlying each conclusion, and the reliability of historical

arguments used, helped the students to check the hypothesis of the unit and their own conclusions. Students thus gained not only basic understandings about historical data but practice in the application of such to social problems through using critical thinking skills.

This procedure was used in each unit of the course at progressively higher levels of understanding, application and generalization. This organization of educational experiences produced greater results in critical thinking with the "C" group than with the "B" group in the same class or the "A" group of a different class in a previous year.

A Summary of the Results

Particular data were compiled to check any significant differences which might have occurred among the various positions along the learning continuum of the ideal-type construct. This information was of two types: results of objective tests such as the A.C.E. Critical Thinking Form G, S.T.E.P. Social Studies Test, and subjective evidence such as inventories, ratings, grades, observations and other evidence related to the characteristics of the learning situations.

There was not a significant gain in critical thinking in the "A" group as demonstrated by comparison of gains on the A.C.E. test of critical thinking with the "B" group. Analysis of the course syllabus, tests, and student ratings showed that it did not meet the minimum criteria required for such achievement.

The minimum criteria seemed to be met in the "B" group in the

History of Civilization course. When compared with the "A" group it made significantly greater gains in critical thinking. The experimental group in the same class approximated the "C" position, for when gains made by it were compared with those of the "B" group it showed a marked difference of achievement.[20] The gains on the three groups were compared using analysis of variance. The difference was significant at the one per cent level of confidence.

The three groups were divided into low, average, and high groups on the pre-test of "Form G."[21] The differences in the gain of the critical thinking were quite obvious. In the "A" group the gain was the same, for all three brackets. In the "B" group, the greatest gains were made by the low pre-test scorers. The "C" group had only one case in the low bracket, which suggests that the high gain was atypical, but the gains for the average and high groups were considerably higher than "A" and "B" groups. So it would seem that the meeting of the "C" criteria stimulated greater achievement on the part of the superior as well as the average and low-average students.[22]

Since pre-test data was not available on group "A" for the S.T.E.P. Social Studies Test, it was not feasible to compare the gains of the three groups on this test. However, a comparison of the gains made by the experimental and control groups in the History

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[20]The difference between the mean gain of the "B" and "C" groups was 3.78.

[21]Supra, p. 87.

[22]Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., p. 248.

of Civilization course supports the contention that the added emphasis on the critical thinking objective in the experimental group was possible without a reduction in content or in achievement of the other objectives of a general education course in the social sciences.[23] The ascendancy of the "C" group in achievement of the particular goals agreed on by the class and the instructor, was manifested by the positive relationship between grades and gains on the critical thinking test. Again it was noted that the students receiving A's and B's in the "C" group made greater gains than these categories in the "A" and "B" groups.[24] The meeting of the "C" criteria resulted in greater increase in critical thinking and a consistent edge in grade-point achievement and overall understanding of general social science content and problems.

Further comparisons of the three groups on their attitude toward class procedure, viz. results of their evaluation of the various required "general" courses, and student ratings of teachers, number of assignments completed, class attendance and participation, participation in related activities, anecdotal records of interviews with students and analysis of gains on the Inventory of Beliefs demonstrated the superiority of the "C" group. Evidence suggests then that maximum critical thinking can be achieved in a course such as the History of Civilization if the learning experiences are selected and organized so as to effect the "C" criteria.

Concurrent with the Civilization course, was an overall

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[23] Supra, p. 90.

[24] Supra, p. 91-94.

emphasis on the objective of critical thinking in the freshman class in 1958-1959. The planning and procedures of these classes, with a few exceptions, approximated the "B" criteria. Although the achievement of both "B" and "C" groups should have been influenced by this study, the gains on the A.C.E. Test of Critical Thinking Form G were lower for the "B" group than for the freshmen who had not taken History of Civilization. The writer feels that the functioning of the two criteria within the same class could have resulted in an adverse affect on motivation of the students in the "B" group.

Some Implications

It seems evident that the objective of critical thinking is attainable within a general education course in social science at the freshman level. And such achievement can be achieved without sacrificing achievement in the content of the course. The emphasis of the critical thinking objective in the planning and teaching of a History of Civilization course seems to provide not only for greater integration within the course and with other general education courses,[25] but the critical thinking skills provide an introduction to historical method for the college freshman. It has been too often assumed that these historical methods are a natural result of studying history. The organization of this course provided a way whereby the desired results from a general education history course could be more effectively attained.

It has been mentioned that this study was a part of attempt

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[25]Dressel and Mayhew, General Education, Explorations In Evaluation, op. cit., p. 273.

to organize all the general education courses on the freshman level for the purpose of attaining this objective. The results, especially at the "C" group, suggest that a great many advantages accrue from such a cooperative effort of this type. It seems apparent that the possibilities of achieving the objective of critical thinking are greater when cooperative planning across divisional as well as departmental lines makes horizontal integration of the learning process an actuality. This was also valuable in-service training experience for the participating instructors. On a survey of Faculty Opinions and Attitudes about the experiment, it was found that, "a large majority of the faculty felt more strongly about the importance of critical thinking than before. They also felt that the study was intellectually stimulating, challenging and provocative as well as providing an impetus for them to try new approaches to teaching for the objective and as an aid in keeping out of a methodological 'rut.'"[26] The respondents were of the opinion that this emphasis on faculty participation in the planning and organization of the general education curriculum resulted in greater understanding of the values of such a curriculum by both students and faculty.[27]

It would seem that since both "B" and "C" groups were in the same classroom that the "C" criteria had two effects, one positive and the other negative. First of all, use of small discussion

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[26]This survey was developed and summarized by the Greenville College director of this study, Professor Richard Stephens.

[27]"Survey of Faculty Opinions and Attitudes," items 1 and 8.

techniques, a variety of experiences, greater stress on student motivation, and a climate of learning which stressed the reciprocal nature of the learning process in the "C" group seemed to be the factors which contributed most to the achievement of the objective. At the same time, the characteristics of application of understandings to contemporary problems, limited practice in the desired behaviors, sufficient time to think about the material, organization using continuity and sequence, and some emphasis on student motivation, did not, without the above, result in as high a level of achievement as was attained by the rest of the freshman class. Either these characteristics were more effective in other classes or the lack of opportunity to participate, other than in a vicarious manner, in the learning process, had an adverse effect on the "B" group. The writer does not feel that this was caused necessarily by lack of participation as such, but by the effect on student motivation of an attitude growing from this lack. Rather able students felt that they were limited in the extent to which they might become actively engaged in the learning process and were inclined to feel that a great deal of effort was not expected of them in this regard. This is made evident by the fact that two in the group raised their grades from C's to solid B's when these factors were not affecting their attitude, during the second semester of the course. It seems possible then, even in a large class, to provide opportunities for the more able students to achieve up to their ability. Small class techniques could be used in a rather large class

to stimulate the able and at the same time the mediocre student would be helped, at least as much as in the so-called "traditional" classroom situation.

The faculty members involved in the experiment with other freshman classes felt that there was "possibly some relationship between the personality of the teacher and improvement in critical thinking."[28] It should be noted that the instructor variable was controlled, since both groups were in the same classroom. Yet the methods which seemed to result in greatest gain were those methods that depended on the establishment of a positive relationship between the instructor and student. This personal variable is an important factor in the setting up of a learning situation where the greatest achievement of critical thinking is the goal. Nevertheless, it has been demonstrated that it is the type of learning experiences or methods used, and not necessarily the instructor, that bring the greatest results.

This study upholds the contention of those educators who assume that methods revelant to the instruction and evaluation of the higher mental processes can be developed and used by the classroom teacher. The challenge of today is to train leaders not only in knowledge about science, engineering, and technology, but in broad understandings which must be applied to government, foreign and civic affairs and educational problems.[29] In the complicated and

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[28] Ibid., item 6.

[29] The President's Commission On Education Beyond the High School. First Interim Report to the President, Washington, D.C., 1956, p. 1.

even confused problems which face our democratic society, these "higher mental processes" are indispensable.

The writer feels that the results of this study should stimulate the further development, and use of methods to obtain this objective in the general education courses in social science at his own and similar liberal arts colleges.

Next Steps

A consideration of the insights gained from this study discloses several important aspects relative to the objective of critical thinking which should provide fruitful material for further study. The first relates to further development and organization of learning experiences so as to attain a greater achievement of this objective; the second, with ways and mean of evaluating the results and relating them to this organization. An additional task would be to identify the specific methods which seem to have the greatest relevance for achievement of this objective.

Some of the questions suggested by this study which should be answered if the maximum achievement of critical thinking is to be achieved are: How can the ideal-type construct aid such future study? How may further integration aid such? Should the analysis of critical thinking behaviors described here be broadened? Could more time be provided for such studies? What specific role do attitudes play in such achievement? And, should an analysis of individual differences be part of such a study?

In the adaptation of the ideal-type construct, the presence

or absence of several characteristics underlying the positions on the continuum was assumed. How could a study be designed to check the value of each of these to the objective? Perhaps some of the characteristics are unnecessary or additional ones may be needed.

Since History of Civilization was taught concurrently with other freshman classes using similar methods and stressing the same objective, then a large degree of horizontal integration was provided. The writer feels that greater integration could be obtained at this point if there was more cross fertilization between academic disciplines for some months or weeks preceding such a study. Frequently, a communications barrier separates faculty members of even a small college when they set out to agree on means of attaining certain objectives which they agree are of value.[30] Would a greater degree of vertical integration be possible? Are the objectives stressed on the freshman level used at other levels as they progress through college? Or do they get the feeling that general education courses are totally unrelated to work done in the other five or six semesters of their college career?

This study was carried on over the first semester; the Illinois Study did not last much longer as its main emphasis was the first semester and the first month or so of the second. Could such a study be carried on over several years? It would thus emphasize

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[30]For instance, when the committee developed some of the common methods which could be used, one was that "assignments should be given in problems." A math instructor reacted by saying that he had always given assignments in problems.

such achievement at least through the sophomore year. A number of the schools with well integrated general education programs have two year programs in the social sciences. The Language Arts division and the Science division of Greenville College have more or less loosely integrated programs, and it would seem possible to organize such a study over a two year period. If so, would the extension of such a study lead to a maximization of the objective of critical thinking?

In such a study could it be assumed that the critical thinking skills ascribed to social science courses are also applicable to other subject fields?[31] This study has assumed that this was not only feasible but one of the purposes of the critical thinking objective in general education, hence "Form G" of "A Test of Critical Thinking" was used in this study rather than the "Test of Critical Thinking In Social Science." What common types of experiences can be set up to assure a more equal emphasis on all of the critical thinking skills given? Or are some of these more or less apropos of certain subject areas than others? Are some of the behaviors of critical thinking more readily obtainable than others? For instance, the observations of the writer were that students more quickly arrived at what they felt were warranted conclusions, but had considerable difficulty identifying underlying assumptions. Should not a general education course in Social Science, especially in the History of Civilization, place greater stress on the definition of

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[31] See Appendix A.

such skills and could this be done by showing how these skills are frequently related to each other in their usage? This seems especially needful for the slow or mediocre student who too often has been made to think that a history of civilization course involves only the factual level of learning and not historical understandings, applications or generalizations which may be developed.

Does this stress on the critical thinking objective place too great an emphasis on the idealized "rational" man of the enlightenment of the eighteenth century? What relationship exists between the emotional life of the student and his ability or inability to think critically? The exploratory study by Philip Jacobs of what happens to values held by American college students as a consequence of the general education they receive in the social science curriculum came up with some rather negative conclusions, regarding the value of existing programs in affecting this aspect of general education.[32] However, Edward Eddy's report of a more recent study conducted by the N.E.A. sounds a more positive note.[33] The writer found a positive relationship between gains on the Inventory of Beliefs and on the A.C.E. Test of Critical Thinking.[34] Certainly there remains much to be found out regarding the relationship of the affective domain and the achievement of critical thinking.

The chief concern of this study was the level of achievement

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[32]Jacobs, op. cit., passim.

[33]Edward Eddy, College Influence On Character (Washington, D.C.: American Council On Education, 1959), passim.

[34]Supra, p. 86, Table 4 and p. 96, Table 10.

of the various groups. However, it was noted that individual scores varied considerably even in the group approximating the most effective realization of the objective. Yet it was difficult to ascertain any pattern to which these differences in individual achievement could be ascribed. It would seem feasible that an analysis of individual cases on a larger sample than used in the present study, utilizing techniques which would identify personality types most frequently associated with high and low achievement in critical thinking, would provide a profitable area of study. Stern used such an approach in assessing the relationship of personality typologies to the achievement of general education objectives as measured on the Inventory of Beliefs.[35]

Regarding the evaluation of results, there are a number of areas to be studied. One is the possibility of identifying critical abilities through using carefully structured subjective evaluative devices, e.g. self-rating sheets for students and ratings by their peers. Introspective devices such as those used by Bloom and Broder, with which the thought processes of the extremely low or high scorers could be studied, should be used so as to more closely identify some of the devices most conducive to the attainment of the objective.[36]

It would seem helpful to develop more information regarding the relationship of gains on "The Test of Critical Thinking" to

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[35] Instructors Manual for the Inventory of Beliefs, op. cit., pp. 11-13.

[36] Bloom and Broder, op. cit., passim.

ratings of students' ability to think by various faculty members. Perhaps ways could be developed of emphasizing the value of techniques of evaluating for such skills in the various classes. The subjective estimation of teachers is often regarded as an unreliable method of evaluation, yet it is based on the same method as that used in the laboratory, that is observation; however, the variables are more numerous. The instructor who has selected the learning experiences with the objective in view and is using other evaluation devices is in a good position to estimate the progress of the individual and of the group. Such technique would no doubt necessitate a greater understanding of the meaning of critical thinking as a general education objective than has been arrived at by a great many of the faculty members that we have had contact with in the course of the Illinois Colleges Study On Critical Thinking.

In the future the writer would like to see normative data on the correlation of critical thinking achievement with achievement on the Sequential Tests of Educational Progress in the Social Sciences and likewise studies on the relationship of critical thinking abilities and academic aptitude in the various areas measured by the S.C.A.T. battery of tests.

Further exploration of these areas by teachers who are involved in teaching Social Science classes in general education in the college classroom should provide a clearer understanding of the nature of critical thinking as well as greater application of this significant objective.

APPENDIX A

AN OPERATIONAL DEFINITION OF CRITICAL THINKING FOR GENERAL EDUCATION IN SOCIAL SCIENCE

Critical Thinking Defined In Behavioral Terms

1. To identify central issues.

   One of the basic skills in critical thinking is the ability to identify the central issues or main theme. A thesis may be perfectly clear; it may be hidden in a mass of verbiage; or it may be unstated. Until the student has identified the central issue, analysis of a presentation cannot proceed on a sound basis.

2. To recognize underlying assumptions.

   An argument is always based upon certain assumptions. These assumptions may be generally accepted; they may be subject to grave doubt; or they may be absolutely untenable. The validity of many arguments depends upon the validity of the assumptions on which they are based. An individual whose analysis does not go beyond the argument and into the assumptions will seldom arrive at a truly satisfactory insight into any social issue.

3. To evaluate evidence or authority.

   a. To recognize stereotypes and cliches.

      Social science materials contain abundant illustrations of faulty thinking in the form of stereotypes and cliches. Everyone is familiar with the popular concepts of the American club woman, the tired businessman, the absent-minded professor, one hundred per cent Americanism, and the good old days. People who accept these at face value may be victimized by skillful propaganda techniques.

   b. To recognize bias and emotional factors in a presentation. The validity of any presentation must depend solely upon such factors as the soundness of its reasoning and its factual basis. Many presentations, however, neglect reason

and fact and substitute highly colored words or appeals to prejudice. This practice may hide from the unwary the fact that there is very little substance supporting a presentation.

Since bias refers to opinions or attitudes based on prejudice and preconception rather than upon fact and reason, it bears no constant relation to truth and is as likely to be favorable as it is to be unfavorable. To detect bias is not to impute dishonesty, for many biases are unconscious. Recognizing this bias, conscious or not, is the important thing. Awareness of the part one's own biases may play in the process of analysis and decision is also an important factor in critical thinking.

c. To distinguish between verifiable and unverifiable data.

An early step in determining the verifiability of a proposition is the distinction between material which is of a factual or verifiable nature and that which is not. Sweeping generalizations, value judgments, beliefs, and opinions are usually unverifiable. Material of a factual nature on the other hand is capable of proof or disproof, although the data necessary to verify it may not always be available.

d. To distinguish between relevant and non-relevant.

To analyze social situations and problems adequately, an individual must be able to distinguish between those facts which have a bearing upon the solution and those that do not. One should ask, "Does this statement define, illustrate, or bear upon the problem?"

e. To distinguish between essential and incidental.

Not all relevant data are essential to an interpretation. Some may be of only secondary significance. To recognizeethat the facts are essential and what facts are merely incidental is important.

f. To recognize the adequacy of data.

To appreciate the connection between adequate data and a valid conclusion is a basic ability in critical thinking. A judgment made on the basis of fragmentary evidence is likely to be of little value. In dealing with social issues it is particularly important that judgments be based upon sufficient information.

It is also important to be able to detect that significant data have been ignored or omitted in a presentation. The omission may have been unintentional, but often the additional evidence has been purposely suppressed in order to strengthen the argument advanced. In many cases consideration of neglected material will destroy an argument completely.

g. To determine whether facts support a generalization.

Facts may be relevant, essential, and adequate but still may not support a generalization purportedly built upon them. The ability to recognize faulty logic of this sort is closely related to the ability to draw warranted conclusions which is discussed below.

h. To check consistency.

All arguments must be checked for internal consistency. Identification of a major inconsistency may invalidate a presentation and, in any case, an argument cannot be considered logically whole if it is based upon contradictory generalizations. If an argument withstands the test of internal consistency, it still should be submitted to a check for consistency with other known data.

4. To draw warranted conclusions.

The drawing of a warranted conclusion may involve either of two different abilities. A conclusion may be a truth or proposition drawn from another proposition which is admitted or supposed to be true; an inference or a deduction. It may also be the end result of an inductive process in the form of a thesis which grows out of an examination of factual data. The abilities discussed under 3 above involve principally the analysis and disinterested examination of evidence. The drawing of warranted conclusions is the active step of bringing together all accepted data in a summary statement of general form.[1]

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[1]Dressel and Mayhew, Critical Thinking In Social Science, op. cit., pp. 1-3.

APPENDIX B

VALIDATION OF THE "TEST OF CRITICAL THINKING FORM G"

The writer assumed that this examination was related to the hypothesis of this study. It was used to make an analysis of the comparative gains made by the three groups of students toward the objective of critical thinking. Hence, it is necessary to present evidence of its reliability and validity when used for this purpose.

"While Form G was the form used, the most extensive data available concerning validity and reliability were obtained from earlier forms, particularly Form A."[1] However, since so many items from Form A have been used, supplemented by the most effective items from Forms B and C, evidence from these earlier forms was used to infer the validity and reliability of Form G. As a matter of fact, the evidence suggests that Form G is the most reliable form since a reliability of .84 was obtained.[2]

"The items selected for Form G have high indices of discrimination. The committee selected only items with indices above .30 in at least two institutions for inclusion on Form G of the test."[3]

Validity was based on judgments of the committee members and

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[1] Instructors Manual for the Test of Critical Thinking Form G, op. cit., p. 6.

[2] Ibid.

[3] Ibid., p. 7.

on numerous other comparisons using rating of critical thinking ability by teachers, counselors and peers.

Correlations with other measures of mental aptitude tend to support the assumption that the "Test of Critical Thinking" is something other than a measure of intelligence. The low correlation with the Inventory of Beliefs and Problems In Human Relations furnish negative evidence of validity.[4] However, the average correlation with the Test of Critical Thinking In Social Science averaged about .60, supporting the assumption of the writer that these two test similar skills despite the difference in content and problems used.

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[4]"Test of Critical Thinking Form G" correlation with A.C.E. Psychological Examination .55; with Critical Thinking In Social Science, .60; with Problems in Human Relations, .25; Inventory of Beliefs, .23, Ibid., pp. 9-10.

APPENDIX C

DESCRIPTION OF THE INVENTORY OF BELIEFS

The committee which constructed the Inventory consisted of representatives from a number of institutions. The members conceived of attitudes as being one of the major clusters of outcomes of an entire general education program or of a college program. Thus they were interested in the total impact of college on students rather than with the outcomes of specific courses. The Inventory of Beliefs consists of 120 statements to which students are asked to respond by means of a four-element key: strongly agree, agree, disagree, strongly disagree.[1]

Reliability

Reliability studies yielded coefficients ranging from .68 to .95 with a median r of .86. Estimates of reliability, based on Kuder-Richardson formulae for internal consistency, run from .89 to .94, depending on the institution.[2]

Validity

The Inventory of Beliefs is related to the achievement of the objectives of general education.

1. Validity in Terms of the Objectives of General Education

Substantial numbers of statements included in the "Inventory" are relevant to objectives of general education was assured by the manner in which these statements were originally obtained from teachers of general

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[1] Instructors Manual for the Inventory of Beliefs, op. cit., p. 5.

[2] Ibid., pp. 5-7.

education courses. Face validity was a fundamental requirement for choosing items to be included in the "Inventory."

2. Validity In Terms of Psychological Dimensions.

To the extent that this collection of statements is characterized by unusually high reliability, it would appear that the instrument is a valid measure of opinions which are relevant to such education.

Evidence for validity in this respect is available from two types of data: (a) correlation with other tests, and (b) analyses of differences between extreme scorers.

2.1 Inter-Test Correlations.

L Low positive correlation between the Inventory of Beliefs and measures of more intellectual or cognitive factors is strongly suggestive of the non-cognitive nature of the dimensions being measured by the "Inventory."

2.2 Comparison of Extreme Scorers.

Persons with extreme low score (i.e., accepting many statements) might be presumed to represent an atypical segment of a college population.

Uses of the Test

1. Inter-College Comparison.

The "Inventory" can be used to show the impact of college experience upon students if the test is administered at the beginning of an academic year and repeated after any desired interval of time. However, the Inventory of Beliefs was designed to cut across the whole college experience rather than to measure opinions about particular course-related topics; changes in test scores cannot be expected to reveal precise information about the effects of any one course or even any group of courses in the curriculum.

2. Intra-College Evaluation.

The Inventory of Beliefs can be used in studies of the curriculum in general education growing out of the known relationship between extreme scores on the "Inventory"

and differential aptitude for and interest in various parts of the general education curriculum. An instructor would be better able to interpret the gains (or losses) made by his students on appropriate subject matter-oriented achievement tests if these students had also taken the Inventory of Beliefs. He could make a more meaningful evaluation of the effectiveness of his instruction if he should discover, for example, that the students who show least gain on his subject matter tests are the very ones whose low scores on the Inventory of Beliefs would have led him to diagnose for them special difficulty in courses of this type.[3]

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[3] Ibid., pp. 9-11.

APPENDIX D

DESCRIPTION OF THE S.T.E.P. SOCIAL STUDIES TEST LEVEL 1A

The S.T.E.P. Social Studies tests were designed to measure student development in the broad social studies understandings and abilities which effective citizens should possess. In order to gain insight into what these understandings and abilities are, members of the Social Studies planning committee considered representative curricula and teaching practices throughout the country. They arrived at a list of abilities involved in critical thinking and analysis and a list of eight social, geographical, political, and economic understandings which the Social Studies tests should assess.[1]

Skills.

1. Identify generalizations, main points, and central issues.
2. Identify, compare, and contrast underlying values, attitudes, assumptions, biases, and motives.
3. Distinguish fact from opinion and recognize propaganda.
4. Assess the adequacy of data with respect to its relevancy sufficiency, verifiability, and consistency.
5. Compare and contrast data.
6. Apply appropriate outside information and criteria.

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[1]Cooperative Test Division. Manual for Interpreting Scores, Sequential Tests of Educational Progress, Social Studies (Princeton, New Jersey: Educational Testing Service, 1957).

7. Draw valid generalizations and conclusions.

Understandings.

1. The nature of social change and its effect on man's way of living.

2. The effects of geographic environment on man's way of living and the institutions he develops.

3. Man's increasing control over the forces of nature as a major factor in accounting for the ways in which he lives today.

4. The nature of democratic society and the rights, privileges, and responsibilities of free men.

5. The means whereby society directs and regulates the behavior of its members.

6. Man's economic wants and ways of satisfying them.

7. The interdependence of individuals, communities, societies, regions, and nations.

8. The various ways in which man attempts to understand and adjust to his environment and his place in the universe.[2]

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[2]Cooperative Test Division. A Prospectus, Sequential Tests of Educational Progress (Princeton, New Jersey: Educational Testing Service, 1957), p. 18.

APPENDIX E

CLASSROOM PROCEDURES WHICH SHOULD CONTRIBUTE TO IMPROVED CRITICAL THINKING SKILLS

I. Activities related to assignments.

A. Assignments should be made in the form of problems or questions rather than page assignments. In so far as possible, this should be done every day, not just when the spirit strikes.

B. The problems presented to students should in so far as the material of the course allows be specifically and clearly related to student needs and student interests. The instructor should constantly search for ways of stating problems that were within the experience range of students.

C. Assignments should encourage student positing of problems. Thus, in so far as possible, students in the class should be asked to help set the assignments in terms of their own interest and their own needs.

D. The course should be so arranged as to give students time to do critical thinking. There was the feeling that many of our assignments are so large that students just do not have the time to do much more than read and to memorize.

E. Assignments should constantly emphasize the connection between that course and other courses. It has become almost axiomatic that transfer of training to happen at all must be facilitated by the teacher. The assignments a teacher makes can help in this regard.

II. Tests as a means of developing problem solving ability.

A. Tests should generally be of the problem type rather than those commanding only recall of information. Tests may be either of the objective or the essay type, but ought to focus on problems which draw on materials from the course, but

which require these materials to be viewed in the light of a new situation.

B. Questions which require summary and bringing together of a variety of facts and principles ought to be used.

C. A variety of test forms should be attempted so that students do not develop stereotyped ways of approaching their solutions.

D. Open book examinations in which independent thinking is actively encouraged is another appropriate technique.

E. Tests and examinations ought to be short enough to allow students to think. The feeling here was that typically examinations required so much recall that students had little time to do more than write out memorized facts.

F. Class time ought to be devoted to the review of every test given.

III Suggested instructional materials.

A. Considerable use should be made of outside materials, films, outside speakers, tape recordings and the like. Then the content of each of these ought to be treated analytically rather than just descriptively.

B. The use of tape recordings of classroom performances and a replaying of these tapes to portions of a class seem to have some merit.

C. The use of a bulletin board or a flannel board or a blackboard should be attempted very frequently.

D. The use of the Science Research Associates Punch Board for test situations might be attempted.

E. Student participation in obtaining materials to be used in class was another approach.

IV Teacher conduct in class.

A. The experimental classes should be encouraged to participate very actively.

B. The physical set up of the experimental classes might be varied. For example, breaking the orthodox pattern of seats in rows might be one approach.

C. The experimental classes ought to be characterized by a somewhat more permissive atmosphere than the control classes.

D. Larger units ought to be the focus of attention rather than small ones so as to encourage students to see interrelationships between a number of facets of the study.

E. More individual and committee work ought to be encouraged rather than treating the entire class as a unit.

F. The teacher ought to give specific attention to the level of difficulty of materials and the aptitude level of the students in theclass.

G. Some of the newer techniques such as the socio-drama and role-playing ought to be attempted very frequently.

H. Individual student conferences ought to be encouraged and with maximum ease for the students.

I. The teacher should lay greater stress on independent work.[1]

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[1]Exhibit B, developed by the Illinois Research Committee of the North Central Association Committee On Liberal Arts, under the direction of Dr. Lewis B. Mayhew.

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