THE INFLUENCE OF LOW AND HIGH LEVEL QUESTIONS AND READING ABILITY ON ACHIEVEMENT IN TENTH GRADE SOCIAL STUDIES

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THE INFLUENCE OF LOW AND HIGH LEVEL QUESTIONS AND READING ABILITY ON ACHIEVEMENT IN TENTH GRADE SOCIAL STUDIES

By

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Submitted to
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COMMITTEE ON GRADUATE STUDIES

The undersigned certifies that he has read, and recommends to the Committee on Graduate Studies for acceptance, a thesis entitled "The Influence of Low and High Level Questions and Reading Ability on Achievement in Tenth Grade Social Studies", submitted by Smita Acharya in partial fulfillment of the requirements for the degree of Master of Education.

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Supervisor

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Date 28/10/77

ABSTRACT

The purpose of this study was to determine the effects of different intellectual levels of questions upon the learning of high and low reading ability students.

Eight grade-ten history classes were selected from the Burin Peninsula Integrated School Board. Each class used the same history unit, however, treatment group 1 (T1) received high-level questions as supporting learning experience, treatment group 2 (T2) received low-level questions as supporting learning experience, and treatment group 3 (T3) received no supporting learning experience. At each treatment there were students of high and low reading ability (determined by Stanford Achievement Test, Form W). A final achievement test was constructed by the researcher and administered to all students at the end of three weeks. The test contained twenty low and twenty high-level questions based on the material covered by the questions.

The statistical procedures used to analyze the data included a 2 x 3 Analysis of Variance, and the Scheffe Method of Multiple Comparisons on the main effects, two 1 x 3 Analysis of Variances and two Scheffe Method of Multiple Comparison of simple effects.

Analysis of the data revealed that questions are central to learning. The students working with both high and low questions outperformed the control group. High

reading ability students outperformed the Low readers. Furthermore, the high reading ability students seemed to achieve better results when working with high level questions while low reading ability students seemed to obtain best results with low level questions. Both the treatment groups did significantly better than their control group.

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Mr. J. Hollett

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Dedicated to my Family

and

My Advisor, Dr. F.G. Jones

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CHAPTER I

Introduction

Questioning is perhaps the central skill in the teaching-learning experience because all the answers we ever get in a classroom are responses to questions. Hunkins (1972) has stated that questioning is central to learning. Aschner (1961) referred to the teacher as "a professional question maker" and claimed that asking questions is "one of the basic ways by which the teacher stimulates student thinking and learning". Charles DeGarmo, in 1911, emphasized its importance in teaching.

> In the skillful use of the questions more than in anything else lies the fine art of teaching; for in such use we have the guide to clear ideas, the quick spur to imagination, the stimulus to thought, the incentive to action.

The importance of questions as an instructional strategy has received increasing emphasis for educators in the past two decades. For example, asking questions is one of the ten major dimensions for studying teachers' behaviour in a widely used system of interaction analysis (Flanders, 1970). Since the fifties, a greater emphasis was placed on processes of investigation. In due process, questions gained increased importance in schools. With such a shift of emphasis, education assumed at least partially, a new posture. The result was the development of specific classifications of questions and questioning

strategies. Examples of such classifications are Bloom's Cognitive Taxonomy 1956, Suchman's Inquiry Strategy 1958, and Taba's Questioning Strategy 1967. According to Taba, questions focus and extend thought at the same level, and lift thought to another level. She relates these functions to questions and not to questioning strategies. The sequencing of questions is most often arbitrary, and there is no identification of the cognitive stages of questions. Rather she ranked them as "What?", "Why?", and "What does it mean?".

Suchman, concerned about the lack of student involvement in their own learning, developed a strategy requiring active student participation. Here, the teacher assumes the role of data source and guide. It is the students who pose four types or classes of questions: verification, experimentation, necessity, and synthesis. The Strategy deals with four types of data: events, objects, conditions, and properties. The main differences of Suchman's inquiry is that the teacher does not employ a questioning strategy. Rather he allows students to employ this strategy.

For the purpose of this study the questions will be categorized according to Bloom's Taxonomy - knowledge, comprehension, application, analysis, synthesis, and evaluation. The reason for this selection is that this taxonomy specifies a definite sequencing of questions and allows for active teacher/text involvement.

Inherent in Bloom's Taxonomy is that the higher levels subsume the lower ones. Thus comprehension subsumes

knowledge; application subsumes comprehension and knowledge and evaluation subsumes synthesis, analysis, application, comprehension and knowledge. This hierarchial nature of the taxonomy is important to remember when formulating questions at the various levels, or when determining objectives at a particular level since it applies that the high level questions include the low level. This scheme, as applied to Bloom's Taxonomy, develops questions that centre around and expand the mental capabilities of students at each level. Many educators are no longer content at having students learn only by reading a text. By using various types of questions, emphasis is not only on content but also process. But what are the outcomes?

The results are difficult to assess. Although, from a theoretical perspective, questions have been recognized as endemic to the teacher-learning process (Suchman 1956, Bloom 1956, Taba 1967, Flanders 1970), little scientific effort has been made to examine the effects of teacher's instructional questions on learner's achievement. What educational objectives can questions help students to achieve? How can effective questions be identified? What are the other factors related to achievement and types of questions used? Social studies teachers should be aware of how effectively questioning strategies enable students to deal intelligently with their world, and their lives. Teachers' questions are of little value unless they have an impact on student behaviour. Yet very few researchers have explored the relationship between teachers' questions

and students' outcomes. Until researchers find answers to questions such as those mentioned above, an effective art of teaching may well remain unrealized.

Statement of the Problem

The purpose of this study was to determine the effects of three different mental process levels of questions upon the achievement of high and low reading ability students.

The researcher specifically examined the following questions:

1. Will there be any significant difference in achievement among three groups of students; those involved with high-level type questioning, those involved with low-level questioning, and those receiving identical materials followed by an absence of questions?

2. Will reading ability produce a difference in achievement between three treatment groups of 10th grade history students?

Definition of Terms

Since the following have technical meaning in relation to this study, they are defined to ensure accuracy of understanding.

High Level Questions: These include questions such as analysis and evaluation questions which rank high on Bloom's six questions hierarchy. Inherent in this taxonomy is that

the higher levels subsume the lower ones. For example, objectives and supporting questions at the synthesis level not only guide students in analysis but also challenge them to function at the levels of application, comprehension and knowledge. It demands arrangement and rearrangement of information into elements, relationships, and organization.

Low Level Questions: This level includes questions such as knowledge and comprehension, which rank lowest on Bloom's Taxonomy. These questions require simple recall of ideas, terminology, facts, and principles, or translation, interpretation, and extrapolation.

High and Low Reading Ability: Students scoring above a quarter deviation from the mean, on the Stanford Achievement Test, Form W, are classified as high reading ability students. Students scoring below a quarter standard deviation from the mean on this test are classified as low reading ability students.

CHAPTER II

Review of Related Literature

This section reviews research of specific aspects of questions and questioning strategies as it relates to classroom situations. The bulk of the related literature deals with importance of questions and questioning in general, examination of questions as used by the teachers or the textbooks in specific subjects, the effect of particular location of questions, and the effect of particular type of questions in social studies.

Importance of Questions and Questioning in General

While educational research dealing specifically with questions is limited, numerous articles and books have praised the merits of questions as a device for effective teaching. Hunkins (1972) stated that questioning is central to learning. According to Taba (1967), questions lift the level of thought in the learning process. In her questioning strategy, she advocated complete involvement of students with questions at each particular learning phase. Taba insisted that premature raising of the thought to a higher level caused a decrease of student participation and a degeneration of total class thought to solely specific knowledge. If adequate attention were provided to each level of questions before continuing to the next higher

stage, the final result would represent high-level thought.

To draw teacher questioning away from specific learning, Burton (1929) identified general principles to good questioning. He stated that questions could be grouped into two broad classes, thought questions, designed to stimulate students' reflective processes and drill questions emphasizing isolated facts. Burton (1944) further added that if questioning was to be improved, the teacher's knowledge of aims had to undergo improvement and, furthermore, teachers had to consider the mental processes of learning by students.

According to Loughlin (1961), effective questioning is effective teaching. Questions should include: (1) distribution so that the whole class is involved; (2) having a balance between factual and thought-provoking questions; (3) utilization of both simple and exacting questions; (4) encouragement for responses, and (5) stimulation of critical thinking by enquiring "To what extent? How? Why? Compare?". Kelbaner (1964) supported these general principles by stating that the purposes of questions must be identified by the teacher, and realized by the student. She provided effective guidelines for the construction, use, and evaluation of classroom questions. They are as follows:

1. Timing: Ask questions at appropriate times.
2. Justification: Ask questions to fulfil specific purposes with maximal economy of time.
3. Clarity: State questions clearly.

4. Formulation: Formulate questions in accordance with the purposes for which they are asked.

5. Appropriateness: Use questions at the point where they can further learning better than any other technique.

6. Flexibility: It is necessary to have questions designed to cover segments of material appropriate to the logic of subject matter and to the differentials in age and ability of learners.

7. Answers: Time questions so as to allow children to think through and formulate answers.

8. Logic, Sequence, and Thought: Thought and understanding must precede questioning.

According to Carner (1965), teachers must be aware of the type of thinking required before they can ask effective questions. There are three levels of questioning - concrete, abstract, and creative. In order to promote critical reading, students must be taught to ask questions at these three important levels.

More effective use of questions was advanced by Wellington and Wellington (1962). Teaching, they stressed, was not the teacher asking questions but rather the teacher guiding students to ask effective questions. Here a simple question requires more than a simple answer. It should help students to define the question in his own words, and develop his ability to discover answers which he can use to make his own conclusion.

Suchman's technique of inquiry training (1966) resembles the ideas of Wellington and Wellington (1962) and Carner (1965). Suchman advocates the use of four types of questions - verification, experimentation, necessity and synthesis. Students can frame these questions in any

sequence they wish.

The above is only a representation of the exhortative writing about questions and questioning in general. This section, although useful, fails to provide specific insight necessary for improving questions, since the information and suggestions are based upon philosophical and pedagogical assumptions rather than on the results of empirically derived evidence. Furthermore, the specific effect of these questions on learning is not investigated here, and as a result questions relating to this problem persist.

Types of Questions Used by the Teachers and the Textbooks

Some research efforts have been directed toward the determination of the types of questions raised in the classroom. In general, the research conducted indicated that teachers' questions are low on the cognitive-emphasis scale.

One of the first serious studies of classroom questions was conducted by Stevens (1912). She noted a large emphasis on memory questions in both English and Social Studies classes, with a larger proportion of this type of questions existing in the Social Studies sections. Several conclusions were drawn from her study:

(a) the teacher did most of the questioning in the classroom and individual differences of students received slight attention;

(b) the classroom was considered primarily as a

TABLE 1-1

Use of Particular Type Questions in Classroom

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Stevens (1912)	Not available	English and Social Studies	Analysis of teachers questioning activities in English and Social Studies classroom.	Frequency and Percentage	(a) Teachers did most of the questioning and individual differences of students received slight attention. (b) There was a major emphasis on memory questions in both English and Social Studies, with a larger proportion of these questions existing in Social Studies section.
Floyd (1960)	Primary school teachers	Not available	Analysis of oral questioning activities through taped discourse of thirty classroom sessions.	Analysis of Frequency and Percentage	(a) 78% of the oral expressions and 93% of all questions were teacher originated. (b) 42% of the total questions were memory questions. (c) Teachers asked an average of 3.5 questions per minute, and wait only a second for an answer.

TABLE 1-1

Use of Particular Type Qucstions in Classroom

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Davis, O.L. and Tinsley, D.C. (1967)	Senior high school and Junior high school.	Social Studies	To analyze the range of cognitive objectives manifested in Social Studies classroom by the student-teachers and pupils' questions. Developed Teacher-Pupil Question Inventory (TPQI) using Bloom's Taxonomy.	Frequency analysis and Chi-Square	(a) Both student-teachers and pupils asked more "memory" questions than all other questions combined. (b) The types of questions asked by teachers and pupils were highly correlated (r=.90). (c) A large portion of junior high student teachers rather than senior high student teachers asked "evaluation" questions. (Chi-square = 18.05 $P < .001$).
Clegg (1967)	Elementary level	Not available	Modified form of TPQI was utilized to record the level of cognitive behaviour of six student teachers.	Frequency analysis	(a) There existed a complete range of cognitive levels in the questions asked by the student-teachers. (b) Only 27% of the questions were classified as memory questions.

TABLE 1-2

Use of Particular Type of Questions in Classroom Materials

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Davis and Hunkins (1966)	Grade five Social Studies texts	Social Studies	Text-questions were classified according to the Taxonomy of Educational Objectives: Cognitive Domain (Bloom).	Item frequency and percentage of the total number of questions.	(a) Of the total seven hundred and thirty-two questions analysed, 78% dealt with knowledge of specifics. (b) It concentrated on knowledge of specific facts rather than knowledge of terminology.
Hearn (1967)	Sixth-grade Text books	Not available	Text-questions classified according to Bloom's Taxonomy of Educational Objectives.	Item frequency and percentage of the total number of questions.	(a) Although the majority of questions dealt with knowledge of specifics, a small number of high level questions were also noted. (b) The cognitive levels of questions in captions were somewhat higher than those in the narrative.

TABLE 1-2

Use of Particular Type of Questions in Classroom Materials

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Pfeiffer and Davis (1965)	Grade nine	All grade nine course semester exam.	Test items analysed according to Bloom's Taxonomy of Educational Objectives: Cognitive Domain.	Item frequency and percentage of the total question.	(a) In social studies area civics examination emphasized exclusively the knowledge of specific information. In world history, examination stressed knowledge of specifics, but also required students to engage in other types of thinking, including synthesis. (b) In all the programs, at least half questions required only memory.

> place for displaying knowledge instead of a laboratory for gaining understanding in depth.

Stevens' work produced empirical evidence that teachers' questions were not geared to the development of higher cognitive functions of students. As a result, she requested logical use of questions as instructional devices and stated that questions should stimulate reflective thought in addition to memorization of facts.

Floyd (1960) studied the oral questioning activity of selected primary school teachers. Analysis of taped discourse of thirty classrooms revealed that about seventy-eight percent of the oral expressions were delivered by the teacher and that ninety-three percent of all questions were teacher-originated. Concerning quality of questions, Floyd noted that forty-two percent of questions asked were memory questions.

To measure the range of cognitive objectives manifested by the questions of student teachers in secondary school social studies, Davis and Tinsley (1967) developed a rating score called Teaching-Pupil Question Inventory (TPQI). This inventory had nine categories, the first seven adopted from Bloom's Taxonomy: memory, interpretation, translation, application, analysis, synthesis, evaluation, as well as affectivity and procedure. Observers trained in the use of the TPQI spent two periods recording the cognitive emphasis of the questions asked by student teachers and their pupils. The study revealed that both teacher and pupil predominantly emphasized memory

questions. Interpretation, translation, and levels of comprehension comprised the next largest number of questions asked.

A similar study, at an elementary level, was conducted by Clegg (1967). A modified form of the TPQI was utilized to record the level of cognitive behaviour of six student teachers. From results obtained, Clegg concluded that there existed a complete range of cognitive levels in the questions asked by the student teachers. Also, only twenty-seven percent of the questions asked were classified as memory questions. However, the relationship between questions and achievement was not examined.

Regarding textbook questions, only a few researchers have focused on its use in instructional materials. Davis and Hunkins (1966) classified questions in three elementary social studies textbooks by using Bloom's Taxonomy as a criterion. Item frequency and percentage analysis were measured. Their observation revealed an overwhelming emphasis on questions dealing with knowledge of specific facts. Of all seven hundred and thirty-two questions analysed, 78% dealt with knowledge of specifics. Furthermore, it concentrated on knowledge of specific facts rather than on knowledge of terminology. Hearn (1967) also employed Bloom's Taxonomy to investigate the cognitive emphasis of questions in the narratives and captions of four sixth-grade textbooks. His results were similar to that of Davis and Hunkins (1966), however, it noted that there were a small number of high level questions. The cognitive levels of

questions in captions were somewhat higher than those in the narrative. Pfeiffer and Davis (1965), using the same criterion, revealed a similar over all emphasis for questions on teacher-made (ninth-grade) tests for three different junior high school programs. The examination exclusively emphasized the knowledge of specific information in a civics program. In world history, the examination stressed knowledge of specifics, but also required students to engage in other types of thinking, including synthesis. In fact, in all programs, at least half the questions required only memory.

Effect of Particular Placement of Questions

It has been claimed in several studies (Rothkopf 1966; Rothkopf and Disbicos 1967; Bruning 1968 and Frase 1968) that groups given factual review questions perform significantly better on a criterion test of incidental information than control groups given no questions.

Rothkopf (1966) examined the effects of experimental textlike questions (EQ's) on both a General Achievement Test (GT) and an Experimental Question On Relevant Test (EQRT). The General Achievement test consisted of twenty-one questions answered by information that was incidental to the experimental questions. Rothkopf used his criterion measures to compare five treatment groups. Four groups were given questions placed in the text shortly before or shortly after the sections to which they pertained;

TABLE 1-3

Effects of Particular Placement of Questions

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Rothkopf (1966)	High school	Not available	To determine effects of experimental test-like questions on general achievement test and experimental question relevant test.	F-ratio and seven level analysis of variance.	The questions shortly after treatment, and the direction to read carefully treatment, produced significantly higher general test scores than the control group.
Rothkopf and Bisbicos (1967)	High school	Not available	To determine the effect of questions differing in location (before or after the relevant segment) and in required type of response.	t-test and analysis of variance.	(a) Learning as measured by a retention test, was facilitated by appropriate questions seen immediately after exposure to the relevant test segments. (b) Questions presented before inspection of the source segment did not produce these results.

TABLE 1-3

Effects of Particular Placement of Questions

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Frase (1968)	College students	Biographical prose material.	The effect of position of factual questions within the text, length of passage, and knowledge of results on specific and general retention.	2 x 3 x 2 factorial analysis	(a) All main effects were found to be significant. (b) Scores on the incidental information test were cited as supporting the facilitating effects of experimental questions on incidental information.

one of the before groups and one of the after groups were given answers after subjects responded; the other groups were not given answers. A fifth group was given all experimental questions and answers before starting the chapter. Rothkopf also included a control group given no questions and no special instructions and another given no questions but directions to read carefully. The seven-level one-way ANOVA design was used.

The results showed that the test-like questions, which are presented after reading the relevant text passage have apparently both specific and general facilitative effects on post-reading performance. Test-like questions which were presented before the relevant text passage was read produced only question-specific facilitative effects. These question-specific effects were greater when the correct answer was given to the student after he made his response than when no knowledge of results was available.

In the Rothkopf and Brisbicos (1967) experiment, the treatment questions differed in locations (before or after the relevant segment) and in required responses. Different treatments saw questions restricted to the following answer types: (a) a quantitative term or name; (b) a common English or technical word; (c) a mixture of (a) and (b). A control group, not given any treatment questions was also used. Two hundred and fifty-two high school students saw a thirty-six page passage with two experimental questions per three page zone. Following the treatment, students took a forty-eight page question

criterion test from which questions containing transfer of information effects had been removed. Results of an analysis of variance showed significant treatment differences. Learning of several categories of text content, as measured on a posttraining retention test, was facilitated by appropriate questions seen immediately after exposure to the relevant test segment. This experiment implies that facilitative effects can be produced by questions that are presented immediately after inspecting the appropriate test segment. Questions presented before inspection of the source segment were not found to produce these results.

In an experiment by Frase (1968), seventy-two college students read a 2,000 word biographical prose passage. A 2 x 3 x 2 factorial analysis assessed the effects of position of factual questions within the text, length of passage, and the knowledge of results. The length of passage refers to the number of lines of prose uninterrupted by an experimental question.

The posttest analysis focused upon (a) questions that had occurred during reading (retention questions), and (b) questions related to the section of prose passage not tested by the retention questions (incidental questions). All main effects were found to be significant. It was concluded that frequent post questioning either shaped or elicited appropriate reading skills while frequent pre-questions interfered with prose structure. Frequent questioning, either pre- or post-treatment, yielded precise

discrimination between relevant and incidental material. Question mode (multiple-choice or constructed response) had no effect. Relevant materials were retained better than the incidental materials.

Effect of Particular Type of Questions on Social Studies Students

The foregoing research results reveal that, even though questions have been considered by research, only a handful of studies have focused upon the cognitive outcomes that different types of questions might evoke. Only four studies to the researcher's knowledge have analysed the effects of questions on achievement when taught with materials stressing high cognitive level questions rather than simple knowledge - recall questions.

Hunkin's study (1966) of the effects of controlled levels of questioning on the achievement of students was one of the first major studies in this area. His research investigated the relative effectiveness of knowledge, analysis, and evaluation questions in stimulating achievement in sixth grade social studies. These question types are based on three of the six hierarchical categories of Bloom's Taxonomy of educational objectives. The general plan of the study involved constructing two sets of text-type materials and corresponding answer sheets. One stressed analysis and evaluation questions and the other stressed knowledge questions. The study took four weeks,

TABLE 1-4

Effects of Particular Type of Questions on Student

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Hunkins (1968)	Sixth grade students	Social studies	To determine the effects of materials - one stressing questions requiring "analysis" and "evaluation" and other requiring simple knowledge and recall as classified by Bloom's Taxonomy. Two other variables, sex and reading level were examined for possible relationship to achievement.	Analysis of Covariance	The employment of high cognitive-level questions (analysis and evaluation) produced significantly greater scores in social studies achievement than did knowledge questions.
Tyler (1971)	Second grade students	Social studies	To determine the relationship of the methods of questions used, to the achievement in Social Studies. Two other variables, sex and location of school were examined for possible relationship to achievement.	Analysis of Variance	(a) Oral presentation of instructional questions in social studies materials resulted in higher level of achievement than did written presentation of instructional materials. (b) Second grade children from suburban schools demonstrated higher level of achievement in social studies than those from urban schools.

TABLE 1-4

Effects of Particular Type of Questions on Student

Researcher	Grade Level	Content	Treatment Comparison	Statistic Used	Outcomes
Beseda (1972)	High school	Social studies	To determine the effect of student teacher's questions on pupil achievement as measured by IOWA test of Educational Development and on critical thinking ability as measured by the Watson-Glaser Critical Thinking Appraisal. Students were randomly assigned to high level questioning or control group.	Analysis of Covariance	(a) No significant difference found on the IOWA test which measured the pupil achievement. (b) Significant difference existed on the critical thinking appraisal in favor of control group rather than the experimental group.
Ryan (1974)	Fifth and Sixth grade students	Social studies	To examine the effects of multiple student responding to different level of questioning, on social studies achievement. Students were randomly assigned to one of three groups; high level questioning, low level questioning, or control.	Analysis of Variance	Results indicated that high level questioned group and low level questioned group outperformed control group in terms of achievement for both post and retention test situation ($P < .01$)

during which time students used these materials for thirty-five minutes per day. Analysis of covariance was used in the experimental design. Within each treatment, data were analysed according to sex and reading achievement. He concluded that sixth-grade children exhibited a higher level of social studies achievement if taught with materials stressing analysis and evaluation rather than knowledge questions. Achievement in this study referred to the raw score on a sixty-item multiple choice test constructed by the researcher. It had a reliability of .69.

Tyler's study (1971) was also designed to test the relationship of the methods of second-grade students. Two other variables, sex and location of school were examined for possible relationship to the subjects' achievement. Her study concluded that oral presentation of instructional questions in social studies materials for second-grade children resulted in higher levels of achievement on the part of the learner than did written presentation of instructional questions. In addition, it noted that second grade children from a suburban school demonstrated a higher level of achievement in social studies than did second-grade children from an urban school, even though both groups come from a similar socio-economic background.

Beseda (1972) investigated the levels of questioning used by student teacher and its effect on pupil achievement and critical thinking ability. The purpose of this study was to determine the effect of student teachers' questioning on secondary social studies students' achievement

as measured by the IOWA Test of Educational Development and the Sequential Tests of Educational Progress, and on critical thinking ability as measured by the Watson-Glaser Critical Thinking Appraisal. Analysis of Covariance was used to analyze the data. No significant difference was found on the IOWA test or sequential tests. However, a significant difference existed on the critical thinking appraisal, but it was opposite to the direction hypothesized. The control group was superior in critical thinking ability as measured by the tests used. This study is interesting in that it concludes against the typical achievement/critical thinking hypothesis as related to higher level of questioning, and yet no strong argument exists to disprove the validity of either.

A more recent study was conducted by Ryan (1974) which examined the effects of multiple student responses to different level of questioning, on social studies achievement. One hundred and five fifth and sixth grade subjects were randomly assigned to one of three groups; high-level questioning, low-level questioning or control. Instructionally, the geographical themes for high-level questioning group and low-level questioning group were identical. But, in implementing instruction, higher (than recall) questions were predominately employed in the high-level questioning group and low-level questions prevailed for low-level questioned group. Analysis of variance indicated that the high-level question group and the low-level question group outperformed the control group in terms of low as well as

high level achievement for both post and retention tests ($P < .01$).

Summary

The use and effect of questions in the area of social studies has been minimal. If it is true that all the answers we ever get are responses to questions, then we are asking the wrong type of questions in our classroom. In general, the research conducted in the area of types of questions used by teachers and textbooks indicate that the majority of these questions are low on the cognitive-emphasis scale. In the area of particular placement of the questions, research tend to state that learning is facilitated by appropriate questions seen immediately after the relevant readings. As for the effect of particular type of questions on social studies, students' research is not conclusive. On the whole, it shows that achievement is related to the type of questions asked, but is inconclusive in area of critical thinking and its relation to questions. In some research, like Hunkins (1968), the Achievement Test reliability is relatively low and the results can be questionable. What is required is a systematic appraisal of achievement instruments, contextual variables, and learning. This study is designed to investigate with these requirements in mind. Further, it was noted that the social studies materials have received scant attention from researchers. The use of history materials in this study

within the level of questioning context, answers the call from Hunkins (1968) and Beseda (1972).

The next chapter deals with the general methodology and specific procedures used in conducting the present study. The information gathered may answer some of the questions raised in discussions from this chapter and may provide a clear understanding of what effects differing levels of instructional ability.

CHAPTER III

Development of Materials and Methodology

This chapter presents an elaboration of the design of this study and the procedures employed in conducting the research. It is divided into the following main sub-headings:

(1) Instrumentation and Materials Of The Study And The Experimental Design.

(2) Experimental Study And The Contextual Variables.

and (3) Statistical Procedures, Hypothesis And Limitations Of The Study.

Instrumentation and the Experimental Design

The Instrumentation

This study used two types of instrumentations. The instrument publisher produced was the following:

> The Reading Test: Stanford Achievement Test, Form W, was used to obtain reading scores of the sample used. High and low reading ability students were classified according to the percentile ranks.

The following text was used for the material content of the experiment:

> The History Text: The students used the adopted Grade 10 series - Man In Society, published by Maclean-Hunter Learning Materials Co. (1972). The specific topic for this investigation dealt with the first ten units of the Future series.

In the present study, the development of the treatment materials, the treatment procedures and the testing

instruments were of prime importance. The treatment materials consisted of three different student and teachers' workbooks.

Workbook Format and Content

These workbooks were divided into three major parts, namely objectives, content and teaching strategy. Treatment 2 (low-level question group) workbooks contained low-level objectives and low level questions as teaching strategy (see Appendix D). Treatment 1 (high-level question group) workbooks contained high level objectives and its corresponding high-level questions as teaching strategy (see Appendix E). Treatment 3 (control) workbooks contained a combination of high and low-level objectives but omitted questions altogether. Instead, students were instructed to make appropriate notes after reading the content (see Appendix F). The content in the workbooks was the same for all treatment groups. Each unit in the student text - Man In Society: The Future - had a parallel unit in the workbook. The various questions that the students were required to answer were premised upon the reading and study of material appearing in each unit of the student's text. The specific questions appearing under the Teaching Strategy section for treatment 2 were written at the knowledge and comprehension levels of the Taxonomy of Educational Objectives: Handbook I, Cognitive Domain (Bloom, Englehart, Furst, and Hill; 1956). The specific questions for treatment 1 were written at synthesis and evaluation levels of the Taxonomy of Educational Objectives: Hand-

book I, Cognitive Domain (Bloom, Englehart, Furst, and Hill; 1956).

Construction and Characteristics of the Achievement Test

A forty-item, four option multiple choice test was constructed as the final Achievement Test. The test content and organization format closely followed the guide provided in Measuring Educational Achievement (Ebel, 1965). The objective of this test was to produce a single achievement score for each subject.

Major facts, concepts and ideas to be learned were identified in the treatment unit objectives (see Appendix A, B, and C). A table of specifications was drawn up and each content item was categorized for inclusion in the table (see Appendix G for table of specifications).

For content validity, the forty multiple choice items were submitted to three judges: Dr. G. Murphy of Curriculum and Instruction Department at Memorial University, Rev. Kearley of Social Studies Department at Avalon North Integrated School Board, and Miss H. Furey, a practising secondary teacher at St. Joseph's High School. All three were well acquainted with Bloom's Taxonomy. The achievement test contained 20 low level (knowledge and comprehension) questions, and 20 high level (synthesis and evaluation) questions. These questions had to be rewritten twice before the three judges fully agreed on the validation of these questions for the particular level they represented. Fry's readibility formula was administered on the achievement test and was found to be within a Grade ten level. Kuder-Richardson formula 20 was

used to test its reliability. Students with the Burin Peninsula Integrated schools who had completed the material on the series Man In Society: The Future were given the final achievement test and the Kuder-Richardson formula 20 was computed to be .81. The computer program used in the above calculation was University of Alberta's Test Scorer and Item Analysis test 01.

This study was a comparative analysis of grade ten students enrolled in the History course - Man In Society offered by the Burin Peninsula Integrated Schools. Campbell and Stanley's (1966) "Post Test Only Control Group Design" was used to set up the study.

The experimental layout for this design is:

R	X	O_1
R	X	O_2
R	X	O_3

R represents the random assignment of high and low reading level students to experimental and control groups.

X represents the treatment.

O represents the post-tests.

While the pre-test is a concept deeply embedded in the thinking of research in education, it is not absolutely essential to true experimental designs. Here, random assignment of the sample makes it possible to omit the pre-test. Furthermore, since the subject matter of the grade ten history series was being taught for the first time to these students, the question of prior knowledge was limited in this study. Campbell and Stanley (1963) have indicated that a pre-test of new subject matter is inappropriate. Because of this facility, the pretest is neglected and post-test only control group

design was used. This particular design was chosen since it eliminates a majority of factors threatening the internal and external validity of the study. Internal validity, the basic minimum requirement without which any experiment is interpretable is well constrained here, since it controls for variables such as history, maturation, testing, instrumentation, regression, selection, mortality and interaction of selection and maturation, etc. (Campbell and Stanley, 1966). External validity which asks the questions of generalizability of this study, is also partly maintained since this particular design controls the interaction of testing and treatment (Campbell and Stanley, 1966).

Experimental Study and the Contextual Variables

This study compared the effects of high-level and low-level question treatments and control group to determine if there were differences in achievement between high and low reading ability students in these treatments.

Sample Selection

Mr. M. Grandy of Burin Peninsula Integrated School Board made arrangements with the appropriate principals and teachers and obtained eight Grade ten classes (171 students) for the experimental study. These classes were already using the text Man In Society for their regular history course. The classes were situated in three different schools, School A had 4, School B two, and School C, also two, making a total of eight classes.

Random Assignment of Individuals to Treatment Groups

Specific steps were conducted in the randomization process. First, all students were administered the Stanford Achievement Test, Form W, appropriate for grade ten students. Student scores on this reading test were rank ordered and a mean and standard deviation were computed. The mean was found to be 26.17 with the standard deviation of 8.46. Students scoring above the quarter standard deviation from the mean 26.17 on the Stanford Achievement Test were classified as high reading ability students. Students scoring below the quarter standard deviation from the mean of 26.17 were classified as low reading ability students. Students falling within these deviations participating in the study but were excluded in the data analysis. The group of low and high reading ability students were then randomly assigned to one of the three treatments, namely low level question group (T_2), high level question group (T_1), and control group (T_3).

Distribution of Students by Treatment

The low and high reading ability students within the eight classes were distributed as displayed in Table 2-1.

TABLE 2-1

Sample Distribution Within Treatments

Treatments	High Reading Ability Students	Low Reading Ability Students	Total
T_1	N=19	N=23	N=42
T_2	N=19	N=23	N=42
T_3	N=18	N=24	N=42
Total	N=56	N=70	126

Not all 171 students were used in the study. There were two underlying reasons for their omission. First, when the treatments by reading levels were set up on the concomitant variables, some students' scores on the Stanford Achievement Test fell into the group between the high and low reading ability levels. This occurred because this study was concerned with only high and low reading ability students. This resulted in 72 percent of the total population being used for the data analysis.

Second, students were deliberately omitted from the analysis since they were absent from the school when the reading test - the Stanford Achievement test was administered. This resulted in a further omission of ten students of the total 171.

Orientation of Teachers

The researcher supplied each participating teacher of the three cooperating schools with the teacher's copy

of the workbook and written instructions regarding procedures. Because the teachers were not required to teach students the treatment unit, no attempt was made to train the teachers in any aspect of the treatment materials. During the experimental period of three weeks, teachers refrained from actively engaging in teaching, but assisted in coordinating the students' use of the materials. This lack of participation was used to minimize student-teacher interaction which could have influenced the experiment.

Treatment Procedures

Specific treatment procedures were employed in this study. Due to randomization of students rather than that of classes, all the three treatments took place within the classroom at the same time. Each of the three treatment groups worked in different parts of the classroom and were not allowed to communicate with any students during the experimental period. The teachers made sure that this rule was enforced. As the text materials used in this study were the same for all the three treatment groups, the focus of the study was on the manipulation of various components within the teaching strategy procedures. The treatment procedures were conceptualized in the following format:

	Treatment 1	Treatment 2	Treatment 3
Presentation			
Narrative in Text	X	X	X
Different Student Workbook Activities	X	X	X
Diagnosis			
Questions as teaching strategy	X_1	X_2	O
Correction	X	X	O
Feedback	X	X	O
Summative Achievement Test (administered to all students at the conclusion of the unit).	X	X	X

The X's indicate the components that were used in the procedure while the O's indicate those components not used. X_1 indicates use of high level questions, and X_2 indicates use of low level questions.

Contextual Variables

The contextual variables which could not be controlled included the effects of the school district, school and the teachers.

School District

The study was conducted in the Burin Peninsula Integrated schools. The total school enrollment with this school board in 1976-77 was 4043, in 20 different schools.

Table 2-2

Enrollment by Grades 1976-77

SCHOOL	K	1	2	3	4	5	6	7	8	9	10	11	Spec.Ed.	Others	Totals
Grand Bank Primary	78	85	83	64									14		324
Partanna Academy					72	76	90	84	81				34		437
John Burke High										66	62	61	11		200
Haddon Academy	67	47	91	74	59	59	65						17		479
Fortune Collegiate								64	61	34	41	41	13	2	256
Harfitt Primary	96	91	118										8		313
Salt Pond Elementary				95	119	95	107	125	127				17		685
Pearce Regional High										110	104	101	11	5	331
Sheen's Hill Elem.	27	33	30	22	23	22	25	24					16		222
St. Mary's, Lamaline	5	6	4	5	7	8	5	8	7						55
Seaman's Memorial	15	19	19	27	17	28	17						4		146
St. Hilda's School	17	16	15	14	11	18	16								107
St. Mary's, Hr. Mille	1	4	4	6	12	12	6								45
Salem Elementary	7	4	3	10	6	7	8								45
Jacques Fontaine High								44	30	49	25	22	9		179
Boat Harbour Elem.	7	6	7	5	9	3	3								40
Brookside Elementary	2	2	4	2	6		2								18
St. Mark's, Baine Hr.	4	10	4	2	3	2	4								29
Grand Le Pierre	11	10	5	8	8	13	12	13	6	6			11		103
Monkstown	1	4	1	4	3	2	2	7	4					1	29
Totals	338	337	388	338	355	345	362	369	316	265	232	225	165	8	4043

Table 2-3

School	Number of teachers
Fortune Collegiate, Fortune	14
Haddon Academy, Fortune	21
Grand Bank Primary, Grand Bank	15
Partanna Academy, Grand Bank	23
John Burke High, Grand Bank	13
Sheen's Hill Elementary, Burin	11
Harfitt Primary, Salt Pond	14
Salt Pond Elementary	31
Pearce Regional High, Salt Pond	16
Jacques Fontaine High, Jacques Fontaine	12
Grand Le Pierre	5
Frampton Elementary, Monkstown	2
St. Hilda's School, Bay L'Argent	4
Boat Harbour Elementary	2
St. Mary's School, Harbour Mille	2
St. Mary 's Elementary, Lamaline	3
Brookside Elementary	1
Seaman's Memorial, Garnish	6
Salem Elementary, Little Bay East	2
St. Mark's School, Baine Harbour	2
TOTAL	199

The student enrollment breakdown in individual schools is shown in Table 2-2. Busing is used to facilitate this arrangement. The total number of teachers with this school board are 199. Table 2-3 gives the exact number of teachers per school. As for teacher qualifications, the board hired 33 full time specialist personnel and 13 part-time specialists. Specific breakdown is as follows:

Table 2-4
Specialist Personnel

	Full Time	Part Time
Physical Education	4	4
Music	3	2
Art	-	-
Home Economics	1	3
Guidance	5	2
Industrial Arts	-	-
Religious Education	-	-
Media	2	2
Special Education	18	-

Teacher qualifications by Newfoundland teachers' certificate level were as follows:

Table 2-5
Teacher Qualifications 1976-77

Certificate One	8
Certificate Two	17
Certificate Three	22
Certificate Four	59
Certificate Five	60
Certificate Six	26
Certificate Seven	11

Characteristics of the Schools in the Study

The eight classes that participated in this study were located in three schools in the Burin Integrated School District. These schools contained the following characteristics.

School A

The school was constructed in 1966. There are 16 regular classroom teachers, and the school was administered by an appointed principal.

Classes ranged from grade nine to eleven. This school had four grade ten classes, all of which were used in the study.

School B

Constructed in 1969, this school contained classrooms from grade seven to eleven. It employed fourteen regular teachers and the school was administered by the appointed principal. It had two grade-ten classes, both of which were used in the study.

School C

The original construction of this school was destroyed by fire on February 14, 1976. The cause of fire was never determined but it was believed to be due to faulty wiring. As a result, this school shared a building with another school of the same school board and community. The original administrative staff and teaching routine was maintained as before. It consisted of grades nine to eleven, with three grade-ten classes. Only two of these were used in this study.

Characteristics of the Teachers in the Study

Four grade ten history teachers from the Burin Integrated School District participated in this study. The researcher spent ten days on the Burin Peninsula while the study was in progress and made considerable observations of classroom and material management during this time. The following teacher characteristics were noted:

Teacher A

This teacher was the eldest of the group, male and had taught for fifteen years. Aged 34, he had two undergraduate degrees - B.A. (Ed.) and B.A., majoring in history. He administrated four of the total eight classes in this study.

Teacher B

This teacher, male, aged 33, also had two undergraduate degrees - B.A. (Ed.) and B.A., majoring in history. He was involved in teaching for the last fourteen years and administered one of the total eight classes in this study.

Teacher C

This teacher, also a male, was in late twenties and had five years of teaching experience. He held a Bachelor of Arts and Education and reported that he had majored in history.

Teacher D

This teacher, the youngest of the group (age 24), male, had been teaching for three years. Majoring in history with a Bachelor of Arts and Education, he helped to administer two of the total eight classes used in this study.

Statistical Procedure

A 2 x 3 two way analysis of variance was used to test the hypothesis of interaction of the variables on the criterion achievement scores (Table 2-6). This experimental analysis was used to determine if the differences between low-level question, high-level question and control treatment produced differences in achievement for the high and low reading ability students.

Table 2-6
Experimental Layout

Questioning Method	Reading Levels High (1)		Low (2)		
High-Level Questions (T1)	X_{111} ⋮	⋮ X_{21n}	X_{121} ⋮	⋮ X_{12n}	$\mu_{1..}$
Low-Level Questions (T2)	X_{211} ⋮	⋮ X_{21n}	X_{221} ⋮	⋮ X_{22n}	$\mu_{2..}$
Control (T3)	X_{311} ⋮	⋮ X_{31n}	X_{321} ⋮	⋮ X_{32n}	$\mu_{3..}$
	$\mu_{\cdot 1.}$		$\mu_{\cdot 2.}$		$\mu_{...}$

According to X_{ijk} notation used in Table 2-6, i = 1,2,3 type of questioning method, j = 1,2 Reading Level and k = n, the unequal number of the student within the method-reading level.

To examine the treatment of main effects, the Scheffe method of multiple comparisons was used. In addition, two 1 x 3 one way ANOVA's and S-method were

computed to examine the effects within cells. All hypotheses were tested at 0.5 significance level. The computer programs used in the above analysis were the University of Alberta ANOV252 and ANOV11.

Statement of the Statistical Hypotheses

The purpose of this study was to compare the low-level questions, high-level questions and no-question treatments to determine if there were differences in achievements between low reading ability and high reading ability students in each of these treatments.

To accomplish this purpose, the following statistical hypotheses were tested at the .05 level of significance. Following are the null and alternative hypotheses of this study.

1. There will be no significant interaction between the types of questions asked and the individual reading ability.

$$H_0: \text{ All } \alpha B_{ij} = 0$$

There will be a significant interaction between the types of questions asked and the individual reading ability.

$$H_1: \alpha B_{ij} = 0 \text{ for at least one } \alpha B_{ij}$$

2. There will be no significant difference in achievement as indicated by the post test scores or students receiving materials followed by high-level questions, low-level questions and the control with no questions at all.

$$H_0: \mu_{1..} = \mu_{2..} \mu_{3..}$$

There will be a significant difference in achievement as indicated by the post test scores of students receiving materials followed by high-level questions, low-level questions and no questions at all.

$$H_1: \mu_{1..} \neq \mu_{2..} \neq \mu_{3..}$$

3. There will be no significant difference in achievement as indicated by the post test scores of students with high reading ability and students with low reading ability.

$$H_o: \mu_{1.} = \mu_{2.}$$

There will be a significant difference in achievement as indicated by the post test scores of students with high reading ability and students with low reading ability.

$$H_1: \mu_{.1} \neq \mu_{.2}$$

4. There will be no significant difference in achievement, as indicated by the means of the post test scores, of high reading ability students receiving materials followed by high level questions and high reading ability subjects receiving only knowledge questions with identical materials.

$$H_o: \mu_{11} = \mu_{21}$$

There will be a significant difference in achievement as indicated by the post test scores of high reading ability students receiving materials followed by high level, and high reading ability subjects, receiving only knowledge questions with identical materials.

$$H_1: \mu_{11} \neq \mu_{21}$$

5. There will be no significant difference in the achievement as indicated by the post test scores of high reading ability students receiving materials followed by higher level questions and high reading ability subjects receiving identical materials followed by an absence of questions.

$$H_o: \mu_{11} = \mu_{31}$$

There will be a significant difference in the achievement as indicated by the post test scores of high reading ability subjects receiving materials followed by high level questions and high reading ability subjects receiving identical materials followed by an absence of questions.

$$H: \mu_{11} \neq \mu_{31}$$

6. There will be no significant difference as indicated by the post test scores of high reading ability subjects receiving materials followed by low-level questions and high reading ability subjects receiving identical materials followed by an absence of questions.

$$H_o: \mu_{21.} = \mu_{31.}$$

There will be a significant difference in achievement as indicated by the post test scores of high reading ability subjects receiving materials followed by low-level questions and high reading ability students receiving identical materials followed by an absence of questions.

$$H_1: \mu_{21.} \neq \mu_{31.}$$

7. There will be no significant difference between low reading ability students receiving materials with high-level questions and low reading ability students receiving the material with low-level questions.

$$H_o: \mu_{12.} = \mu_{22.}$$

There will be a significant difference between low reading ability students receiving materials with high-level questions and low reading ability students receiving the material with low-level questions.

$$H_1: \mu_{12.} \neq \mu_{22.}$$

8. There will be no significant difference between low reading ability students receiving materials with high-level questions and low reading ability control students receiving the materials with no questions.

$$H_o: \mu_{12.} = \mu_{32.}$$

There will be a significant difference between low reading ability students receiving materials with high-level questions and low reading ability control students receiving the materials with no questions.

$$H_1: \mu_{12.} \neq \mu_{32.}$$

9. There will be no significant difference in achievement scores between the low reading ability students with low

questioning materials and low reading ability students in the control group.

$$H_0: \mu_{22} = \mu_{32}$$

There will be a significant difference in achievement scores between the low reading ability students with low questioning materials and low reading ability students in the control group.

$$H_1: \mu_{22} \neq \mu_{32}$$

Limitations of the Study

This study had several limitations which must be considered when examining its findings.

One of the limitations of the study was that while the researcher spent, on average, three days a week observing and assisting in the schools, there could be no total check made to ensure that written and oral directions were being carried out by the teachers and students in the study. Oral and written directions were provided prior to the beginning of treatment to each teacher, along with a sample copy and classroom set of the materials in the format to be followed. Classrooms were visited regularly each week and teachers reported no irregularities. These procedures strengthened the assumption that the teachers and students followed the instructions outlined, but the degree to which individuals may have deviated from the established procedures cannot be determined.

A second limitation is that even though teachers did not actively intervene in students' use of these materials, they were present in the room and thus possibly

affected the student in some unknown ways.

A third limitation is the assumption that the study eliminated for the major part the teacher-student and student-student interaction. This assumption of no interclass or intraclass interaction within and between treatments may have a confounding effect upon the results of the investigation.

A fourth limitation is that the length of the experimental period may not have been sufficient to facilitate students using analysis and evaluation questions. Furthermore, there was no difference in duration of time between each treatment. It is probable that different levels of achievement would require different time periods for mastery. In addition, the absence of teacher-class discussion, when working with high level questions, may also have a confounding effect upon the results.

A fifth limitation is that the study lacked complete student randomization. The study included partial random assignment. However, complete random selection was difficult due to the nature of the study. It may be noted that this study is presented, with its limitations, in anticipation of opening further areas of research.

CHAPTER IV

Results and Discussion of the Findings

The purpose of this chapter is to report, analyze, and discuss the data gathered in this study. The chapter is divided into two sections: 1) Presentation of the Findings; and 2) Discussion of the Findings. Table 3-1 presents the raw cell mean data that was used in the analysis of variance and subsequent data analysis.

Table 3-1

Final Achievement: Cell Mean Scores By Treatment and Reading Ability

Treatments	High Reading Ability	Low Reading Ability
Treatment 1 (high)	$\bar{X}$ = 29.333 N = 18 $S^2_{\bar{x}}$ = 11.41	$\bar{X}$ = 22.333 N = 21 $S^2_{\bar{x}}$ = 6.83
Treatment 2 (low)	$\bar{X}$ = 28.388 N = 18 $S^2_{\bar{x}}$ = 7.31	$\bar{X}$ = 23.000 N = 20 $S^2_{\bar{x}}$ = 20.94
Treatment 3	$\bar{X}$ = 26.222 N = 18 $S^2_{\bar{x}}$ = 11.47	$\bar{X}$ = 20.250 N = 24 $S^2_{\bar{x}}$ = 11.93

Presentation of the Findings

Analysis of the data by the ANOVA252 and ANOVAll are presented in Tables 3-2, 3-3, 3-4, 3-5, and 3-6. A 2 x 3 two way analysis of variance was used to test the statistical hypothesis (Table 3-2). All nine hypotheses were tested with the following findings:

$$H_o: \text{ All } \alpha B_{ij} = 0.$$

Table 3-2

Experimental Layout For 2 x 3 AVOVA

Treatments	Reading Levels High (1)	Low (2)	
High Level Questions (T1)	$\mu_{11.}$	$\mu_{12.}$	$\mu_{1.}$
Low Level Questions (T2)	$\mu_{21.}$	$\mu_{22.}$	$\mu_{2..}$
Control (T3)	$\mu_{31.}$	$\mu_{32.}$	$\mu_{3.}$

1. Interaction: Treatment by Reading Ability

This statistical hypotheses, that there will be no significant interaction between the types of questions asked and individual reading ability was tested against

the alternative hypotheses that there will be significant interaction between the types of questions asked and the individual reading ability.

There was no significant interaction of treatment and reading ability (See Table 3-2). The null hypotheses, was therefore accepted.

2. Main Effects: Treatments (A)

$$H_o: \mu_{1..} = \mu_{2..} = \mu_{3..}$$

This statistical hypotheses, that there will be no significant difference in achievement as indicated by the post-test scores of students receiving materials followed by high level questions, low level questions and the control with no questions at all, was tested against the alternative hypotheses that there will be a significant difference in achievement as indicated by the post-test scores of students receiving materials followed by high level questions, low level questions, and no questions at all. The F ratio for the treatment effect on Scheffe's multiple comparisons of main effects was non-significant for treatment one (high level questions) and two (low level questions), but was significant for treatment one (high level questions) and control and treatment two (low level questions) and control (See table 3-3).

3. Main Effects: Reading Ability (B)

$$H_o: \mu_{.1.} = \mu_{.2.}$$

Table 3-3

Results of the ANOVA Analysis

Test For Additivity

Source	Sum of Squares	D.F	Mean Squares	F Ratio	Significance
SAB	12.8125	2	6.40625	0.5473	N.S.
SE	1322.56	113	11.7041		

Scheffes Multiple Comparisons of Main Effects (A)

I	J	Contrast	F. Ratio	Significance
1	2	.08584	0.0061	N.S.
1	3	2.466	5.22	0.006*
2	3	2.552	5.67	0.004*

Scheffes Multiple Comparisons of Main Effects (B)

I	J	Contrast	F. Ratio	Significance
1	2	6.1227	95.08	0.000002*

* Significant at 0.05

This statistical hypothesis, that there will be no significant difference in achievement as indicated by the post-test scores of students with high reading ability and students with low reading ability was rejected in favor of the alternative hypothesis, that there will be a significant difference in achievement as indicated by the achievement scores of students with high reading ability and students with low reading ability (see table 3-3).

Simple Effects: High Reading Ability Students

The null hypothesis stated with respect to achievement, that at the high reading ability level, there is no significant difference between the student scores in treatment one (high-level questions) and treatment two (low-level questions).

One way analysis of variance was computed for the high reading ability group, followed by the Scheffe's Multiple Comparison Test. The cell means for high reading ability group across each treatment level are presented in Table 3-4.

Table 3-4

High Reading Ability Group: Results of The 1 x 3 ANOVA

Treatments	Cell Size	Mean Score	Variance
1 (high level questions)	18	29.333	11.412
2 (low level questions)	18	28.389	7.311
3 (control	18	26.222	11.477

The results of the Scheffe Multiple Comparison are reported in Table 3-5. There were no statistically significant differences in two of the three contrasts.

Table 3-5

Achievement: Summary of Results of The Scheffe Multiple Comparison of High Reading Ability Students

Contrast	F-Ratio	Significance
$\mu_{11.} - \mu_{21.}$	0.898	Not significant
$\mu_{11.} - \mu_{31.}$	2.960	Significant at .05 level
$\mu_{21.} - \mu_{31.}$	2.060	Not significant

4. Simple Effects: Treatment One and Two (High Reading Ability Students)

$H_o: \mu_{11.} = \mu_{21.}$

According to the analysis above, that there was no significant difference between and , the null hypothesis was accepted. There was no significant difference between students receiving high and low-level questions.

5. Simple Effects: Treatments One and Three (High Reading Ability Students).

$H_o: \mu_{11.} = \mu_{31.}$

The statistical hypotheses, that there will be no significant difference in achievement of high reading ability students receiving materials with high-level questions and same ability students receiving identical materials with no questions at all was rejected for the alternative hypotheses which stated that there was significant difference in achievement between the high reading ability students receiving materials with high-level questions and those in the control group (absence of questions).

6. Simple Effects: Treatment Two and Three (High Reading Ability Students)

H_o: $\mu_{21.} = \mu_{31.}$

This null hypothesis stated that there will be no significant difference in achievement of high reading ability students receiving materials with low-level questions and the same ability students in the control group. Scheffe's Multiple Comparison found no significant difference between the two groups. Therefore, the null hypothesis was accepted.

Simple Effects: Low Reading Ability Group

One way analysis of variance was computed for the low reading ability group, followed by the Scheffe's Multiple Comparison. The cell means for the low reading ability group across each treatment level are presented in Table 3-6.

Table 3-6

Low Reading Ability Group: Results of The 1 x 3 ANOVA

Treatments	Cell Size	Mean Score	Variance
1 (high level questions)	21	22.333	6.833
2 (low level questions)	20	23.000	20.947
3 (control)	24	20.250	11.935

The results of the test are reported in Table 3-7. The only contrast that was statistically significant was

Table 3-7

Achievement: Summary of Results of the Scheffe Multiple Comparison of Low Reading Ability Students

Contrast	F-Ratio	Significance
$\mu_{12.} - \mu_{22.}$	0.593	Not significant
$\mu_{12.} - \mu_{32.}$	1.946	Not significant
$\mu_{22.} - \mu_{32.}$	2.562	Significant at .05 level

between low reading ability students given low level questions (Treatment 2) and low reading ability students in the control group (Treatment 3).

7. Simple Effects: Treatment One and Two (Low Reading Ability Students

H_o: $\mu_{12.} = \mu_{22.}$

The above null hypothesis stated with respect

to achievement, that at the low reading ability level, there is no significant difference between the student scores in treatment one (high-level questions) and treatment two (low-level questions).

As a result of the analysis, the above null hypothesis was accepted.

8. Simple Effects: Treatment One and Three (Low Reading Ability Students)

$$H_o: \mu_{12.} = \mu_{32.}$$

This statistical hypothesis, that there will be no significant difference in achievement of low reading ability students receiving materials with high-level questions and the same ability group receiving identical materials with no questions at all was accepted.

9. Simple Effects: Treatment Two and Three (Low Reading Ability Students)

$$H_o = \mu_{22.} = \mu_{32.}$$

This null hypothesis, that there will be no significant difference in achievement of low reading ability students receiving materials with low-level questions and the same ability students in the control group was rejected for the alternative hypothesis which noted that there was a significant difference in achievement between the low reading ability students receiving materials with low-level questions and those in the control group, not given any questions.

Discussion of the Findings

The main concern of the researcher in this study was to examine the effects of different levels of questioning procedures on students of varying reading ability when social studies materials were used. The study found that when individual reading ability was disregarded (main effects of treatment), there was no significant difference in achievement between the students working with high or low level questions. However, there was significant difference in achievement between each treatment and the control group. This finding is consistent with that of Ryan (1974) where analysis of variance also indicated that the high level group and the low level group outperformed the control group in terms of achievement scores for both post and retention tests ($P < .01$). And although these findings are not consistent with Hunkins (1966) in that this study found that students did not achieve significantly higher when using materials stressing analysis and evaluation rather than knowledge questions, the results were similar to Beseda (1972). This later study investigated the levels of questions used by student teachers and its effect on pupil achievement and critical thinking ability. The purpose of this study was to determine the effect of teachers' questions on secondary social studies students' achievement as measured by the IOWA Test of Educational Development and the Sequential Test of Educational Progress. Students were randomly assigned to high level question group or control and

analysis of covariance found no significant difference on the IOWA test or Sequential tests.

In addition, the present study found that high reading ability students working with high level questions achieved significantly higher scores on the criterion test than similar ability students in the control group. At the same time the low reading ability students working with low level questions also achieved significantly higher than their control group counterparts. Furthermore, although there was no significant difference between each of the three groups, there seemed to be a trend regarding each of the ability groups. The high reading ability students scored higher when working with high level questions (T1) than did those working with low level questions (T2). The control group had the poorest achievement scores. Similarly, the low reading ability students scored higher when working with low level questions (T2), followed by those working with high level questions (T1), with the poorest results coming from the control group.

In the area of reading ability, it would seem that better readers scored higher results on the achievement test. One might examine this discussion and state that good readers will do well at all levels of achievement regardless of the types of questions provided, but this was not totally so. Significant difference existed between the high reading ability students working with high level questions and those given no questions at all. However, there was no significant difference in achievement between high reading ability students given low level questions and

their control group. These results suggest that, in the case of high reading ability students, significant achievement was not a function of absence or presence of questions, but rather it was a function of absence of questions or presence of high level questions.

In the area of low reading ability students, it should be noted that these students achieved significantly better scores when working with low level questions as opposed to no questions at all. However, when these students worked with high level questions as opposed to those with no questions at all, no significant difference existed.

These results suggest that high reading ability students do relatively well when working with high level questions, since they can not only handle various types of reading materials but also comprehend and analyse what the high level question is asking. However, when working with low level questions they do relatively poorly, since these questions do not challenge their superior ability and potential. The learning situation here is not as interesting or rewarding. Furthermore, when questioning structure is completely removed, student achievement is even poorer.

In the low reading ability context, it may be assumed that these students perform relatively well when working with low level questions, since these low level questions are compatible to their low reading ability. However, when working with high level questions, these

students are not only threatened but are also frustrated due to lack of teacher instruction and help, and, as a result, possibly achieve relatively poorly. These students may have lacked school experience that would foster analytic skill development needed for high level questions. Higher level mental operations are dependent upon students training in logical types of thinking. Lacking such training, it seems, would greatly hinder such student's ability to use questions. Further, the three weeks of the experimental time may not have been sufficient time to correct learning deficits.

In case of the low reading ability control group, where students were forced to work without any questions, the final achievement score was poorest. This may be due to the lack of a structured learning situation. Questions provide direction to learning and achievement. Without these guiding questions, the low reading ability students appear not to achieve as well as they can, when given low level questions.

This chapter has presented the findings of the study for each of the statistical hypotheses and has discussed some of the implications. The next chapter provides a summary of the study, introduces some educational implications, and recommends areas for further research.

CHAPTER V

Summary, Discussion, And Recommendations

Summary

Statement of the Problem

The purpose of this study was to determine the effects of four different mental process levels of questions upon the achievement of high and low reading ability students.

Specifically, the following questions were examined;

1. Is there any significant difference in achievement among three groups of students; those involved with high level type questions, those involved with low level questions, and those receiving identical materials followed by an absence of questions?
2. Will reading ability produce a difference in achievement between three treatment groups of 10th grade history students?

Instruments

This study used two types of instrumentations. The first was the Reading Test, Stanford Achievement Test, Form W, used to obtain reading scores of the sample used. High and low reading ability students were classified according to the percentile ranks.

The second type of instrument was that developed by the present researcher. It consisted of three different student and teachers' workbooks, one set stressing

questions requiring analysis and evaluation (high-level) questions for Treatment 1, the second stressing knowledge and comprehension (low-level) questions for Treatment 2. The third workbook contained a combination of high and low level objectives but omitted questions altogether. Instead, students were instructed to make appropriate notes after reading the content. The content in the workbooks was the same for all treatment groups.

Finally, a researcher-constructed forty-item, four-option multiple choice test was used as the Final Achievement Test in the study. The objective of this test was to produce a single achievement score for each subject. It consisted of twenty high-level questions (synthesis and evaluation) and twenty low-level questions (knowledge and comprehension) and was validated by three judges familiar with Bloom's Taxonomy. Fry's readability formula found the test to be within a grade-ten reading level. Kuder-Richardson formula 20, used to test its reliability, was computed to be .81.

Procedures

Eight grade-ten history classes were selected from three different schools within the Burin Peninsula Integrated School Board (171 students). Stanford Achievement Test, Form W, was used to differentiate between the high and low reading ability students. These students were randomly assigned to the three treatments, T1 receiving high level questions as supporting learning experience, T2 receiving

low level questions as supporting learning experience and T3 where questions were totally omitted.

During the experimental period of three weeks, teachers refrained from actively engaging in teaching, but assisted in coordinating the students' use of the materials. This lack of participation was used to minimize student-teacher interaction which could have influenced the experiment.

After three weeks, the achievement test constructed by the researcher was administered to all the subjects. A 2 x 3 Analysis of Variance and Scheffe's Multiple Comparison was used to test the main effects. In addition to examining the treatments within the cells, two one-way analysis and S-methods procedures were used.

Findings

The findings of the investigation were reported separately for each of the statistical hypotheses used to test the research hypotheses. The research hypotheses were intended to establish whether there was any significant difference in achievement among three treatment groups; those involved with high level questions, those involved with low level questions, and those receiving the same materials but with no questions. Secondly, it enquired whether the differences in reading ability produce differences in learning between the three treatment groups.

This study found that there were no significant differences in achievement for the students in Treatment 1

(high-level questions) and 2 (low-level questions), however there was significant difference between Treatment 1 (high-level questions) and Treatment 3 (control) and Treatment 2 (low-level questions) and Treatment 3 (control). Regarding the second research question, the study noted that high reading ability students produced significant results when working with high-level questions and low reading ability students achieved significantly well with low-level questions as compared to the control group.

Findings of the Treatment by Reading Ability: Interaction

There was no significant interaction between the types of questions asked and the overall reading ability.

Findings Between Treatment Groups: Main Effects

There was no significant difference in achievement scores between the students in Treatment 1 (high-level questions) and Treatment 2 (low-level questions). However, the students in both Treatment 1 and 2 scored higher than the ones in the control group.

Findings Between Reading Ability Groups: Main Effects

Students of high reading ability scored significantly higher than those of lower reading ability.

Simple Effects: Findings of the High Reading Ability Across Treatment

There was no significant difference in achievement

between the high reading ability students working with high and low level questions or between these students working with the low level questions and the control group. But there was significant difference between the high reading ability students working with high level questions and the control group. The treatment group did better than the control group.

Simple Effects: Findings of the Low Reading Ability Across Treatment

There was no significant difference in achievement between the low reading ability students working with high and low level questions or between students working with the high level questions and control group. But there was significant difference between the low reading ability students working with low level questions and the control group. The treatment group did better than the control group.

Discussion of Educational Implications

The prime concern of this study was to examine the effects of different levels of questioning procedures on students of varying reading ability when social studies materials were used.

This study found that when individual reading ability was disregarded (main effects of treatment) there was no significant difference in achievement between the

students working with high or low level questions. However, there was significant difference in achievement between each treatment and the control group.

The study also noted that high reading ability students learned and retained more of the history unit than low reading ability students. This result suggests that achievement was, in part, a function of the capacities and talents for learning that students of varying abilities brought to the instruction. Since these were the findings in general, the following suggestions would seem in order.

Questioning strategy is central to learning. Students working with questions in general will achieve significantly higher results than those working without questioning structure. Simply providing behavioural objectives of a lesson is not enough. Questions facilitate achievement in a learning situation. It seems to stimulate student thinking and learning and it follows that the task of every teacher is to become a "professional question maker" (Aschner, 1961). In a case where teachers are working with heterogeneous groups, it does not seem to make any significant difference as to what types of questions (high or low) are asked as long as questions are asked.

The present study also made substantial finding in the area of specific reading ability and questioning levels. Significant achievement difference existed between the high reading ability students working with high level questions and those given no questions at all. Furthermore, there seemed to be a general trend that high reading ability

students obtained significant results when working with high level questions. However, when working with low level questions, they do relatively poorly, since these questions do not challenge their probable superior ability and potential. The learning situation here was not as interesting or rewarding. Furthermore, when questioning structure is completely removed, student achievement is even poorer. In the low reading ability context, it may be assumed that these students perform relatively higher when working with low level questions since these low level questions are compatible to their low reading ability. However, when working with high level questions, these students do not perform as well since they may be threatened and possibly frustrated due to their low reading ability and lack of teacher assistance. In the case of the control group, where these students were forced to work without any questions, the final achievement score was poorest. This result may have been due to the lack of a structured learning situation resulting from the lack of questions. The above information may be of value to teachers, test makers, and publishers working with individuals with different reading levels. It seems to suggest that asking high level questions without any specific training in higher level mental skills, may hinder rather than help students with low reading ability. Yet these same questions may aid student achievement in the case of high reading ability students. On the whole, questions in general are still of prime importance in a learning situation and achievement seems to be a function of

the existence of questioning strategies.

Recommendations For Further Research

Based on the findings and conclusions of the present study, the researcher submits the following specific recommendations for further systematic research relating to the effects of different levels of questions on students of varying ability.

1. This study should be replicated in its present form using a larger number of schools, grade levels, and school systems.

2. This study should be replicated in its similar form without the artificiality of an experimental setting (the three experimental groups in one classroom) and without the student's knowledge that he is involved in an experiment.

The first recommendation made above acknowledges the fact that the sample used in the experiment was drawn from a population of tenth grade students of the Burin Integrated School System. Thus, the findings of this study can be generalized to similar populations that have similar characteristics. The second recommendation emphasizes the fact that the artificial experimental setting of this study where all three treatments took place in a classroom at the same time may have affected the results. In short, modification of the study can also be productive. The rest of the

recommendations provide direction for modification.

3. A similar study should be designed where two sets of teachers are trained to form specific types of high and low level questions each. The study should examine the social studies achievement of students working with these teachers as compared to the teacher who did not receive this training.

4. This study should be modified using teacher rather than text materials asking the high and low level questions in other areas of social studies and school curriculum. This may help us to answer whether certain types of questions are more productive in certain subject areas.

5. Other variables, such as student attitude towards the subject of the study, as well as individual reading level and levels of questions may be examined as a function of achievement.

The above are only a few of the possible studies that should follow this research. A systematic, comprehensive study of questioning is needed. This would entail a large scale, well coordinated team effort where individual investigators would each focus on a single task or variable yet coordinate such research with that of other colleagues. Such a group effort is needed not only in research dealing with questions and levels of questioning, but in the many aspects of investigating theories and practices in education.

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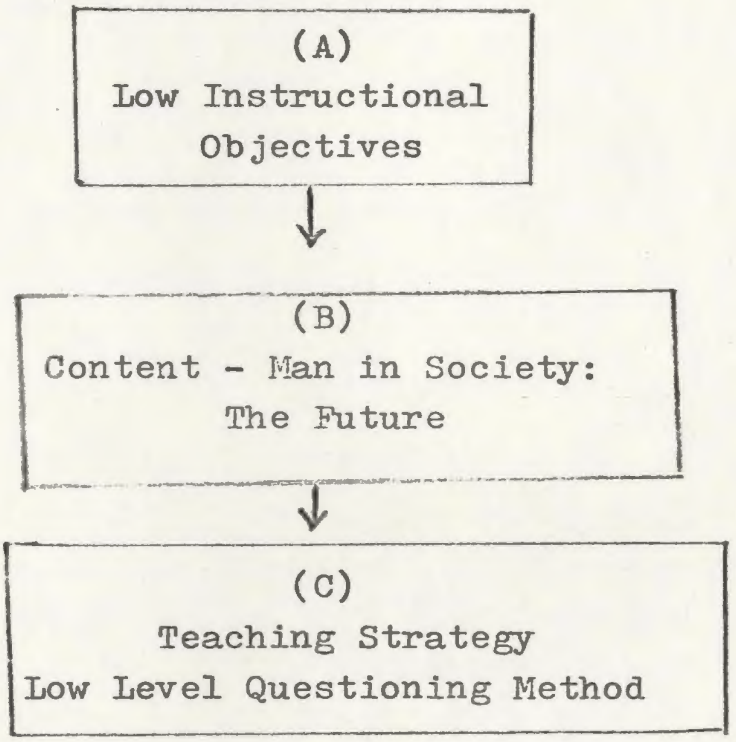
APPENDIX A

Instruction for Teachers: Treatment 1

The following instructional system model is used by the students in Treatment 1. It involves three major steps: (A) Low specific objectives provided to direct student learning at this level, (B) the Content, specifying the article to be read and (C) the Teaching Strategy of low level questioning method.



Model for treatment 1, Instructional System

At the beginning of a lesson, all students in Treatment 1 will be given the written objectives for that lesson. Instruct the students to study the objectives carefully since it lists the expected student learnings. Next, direct the students to read the lesson as it appears

in their textbook. They should be reminded to keep the stated objectives in mind when reading the lesson since they serve as organizers to direct learning. Following this, direct students to answer all the given (low level) questions related to their reading. Students should be urged to work on their own and be informed that the questions will not be graded for marks but will assist them to prepare for the final achievement test administered at the end of the three week experimental period. Students should not interact with each other during the experimental period of three weeks. Teachers are asked to refrain from actively engaging in teaching but should assist in coordinating the students' use of the materials.

Instruction for Students: Treatment 1

The following instructional booklet is produced for the use of students in Treatment 1. It involves (A) specific Objectives, (B) Content, and (C) Teaching Strategy.

At the beginning of a lesson, all students will be provided with the written objectives for that lesson. Study these objectives carefully since it lists the expected student learnings. Next read the lesson as it appears in your textbook - Man in Society: The Future. Specific reading instructions appear under Section (B) Content. Keep the stated objectives listed under (A) in mind when reading the lesson. They serve as organizers to direct learning. Following this, answer all the given questions related to your reading. These appear under Section (C), teaching strategy. Students are not allowed to interact with each other during the experimental period of three weeks. When answering questions, you are urged to work on your own. Your answers will not be graded for marks but are provided to help you learn the appropriate information. The final test will be administered in May 19th, 1977. It will include all the items covered during the three week period. Good luck!

Treatment 1

I Unit on "Technology or People"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to define what is meant by the term "technology".
2. Students will be able to list five conveniences that new technology provided George Daedalus with.
3. Students will be able to state in 2-3 sentences how Robert Collins sees the future.
4. Students will be able to summarize in not more than 15 sentences, the predictions made by Robert Collins.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology or people", pages 5-6.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology or people", answer the following five questions. You may refer to the text if required.

1. What is technology? Give a brief definition of it.
2. List five (5) conveniences that are provided for George Daedalus by the new technology.
3. Is Robert Collins' theory of the future optimistic or pessimistic? Give three reasons why.

4. What are the predictions made by Robert Collins? Summarize them in not more than fifteen sentences.

5. Robert Collins states that in George Daedalus' era, immortality may be worth having. From the information provided on page 6, interpret how the author would answer that question.

II Unit on "Life in Century 21"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson on "Life in Century 21"

(A) Objectives

1. Students will be able to list five of the technological advances that Canadians of the 21st century may be using.
2. Students will be able to write down whether the Canadians living in the 21st century will have more or less leisure time as compared to us (knowledge of theory and structure and extrapolation.
3. Students will write a half-page summary of what life in century 21st will be like.
4. Students will be able to separate all the technological advances mentioned in the reading into two lists:
   (a) those that are invented now, but have not been put into popular use.
   (b) those that will depend on future inventions or technological advances.

(B) Content

Text - Man In Society: The Future

Read the unit on "Life in Century 21", pages 7-8.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Life in Century 21", answer the following five questions. You may refer to the text if required.

1. List five (5) technological advances which may be enjoyed by the Canadians of the 21st century.

2. Will the Canadians living in the 21st century have more or less leisure time compared to us, living in the 20th century?

3. Summarize in not more than half a page what life will be like in the 21st century.

4. List in two columns, (a) all technological devices mentioned that have been invented but not yet in popular use, (b) all those mentioned that will depend on future inventions.

5. Write a summary (not more than seven sentences) describing how you would entertain a friend joining you for a dinner in the 21st century.

III Unit on "Technology will destroy us"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to list three types of information the computers use in making predictions about the future of mankind.
2. Students will be able to write down in their words the solution offered by the computer, for the prevention of future destruction.
3. Students will be able to summarize, in not more than 10 sentences, the predictions made by the computer if we continue to advance in generally the same direction technologically as we have been.
4. Students will be able to assert in writing whether the writer believes that the computer's recommendations will be followed or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology will destroy us", pages 9-10.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology will destroy us", answer the following five questions. You may refer to the text.

1. List three types of information the computers use in making predictions about the future of mankind.
2. In your own words, state the computer's solution for the prevention of future destruction.

3. Summarize (in not more than 10 sentences) the predictions made by the computer if we continue to advance in generally the same directions, technologically as we have been.

4. What do the computers predict will happen given each of the following situations:

   (a) If we increase our investment in industry and technology, especially in the under-developed countries.

   (b) If we cut our birthrate in half.

   (c) If we, in addition to reducing our birthrate, cut down on food production, industry, and technological investment and development.

5. Does the writer believe that the computer's recommendations will be followed. Why, or why not?

IV Unit on "Machines That Think"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to write the year and place in which the first digital computer was developed.
2. Students will be able to list three areas where computers might be widely used in the future.
3. Students will be able to write in their own words the way in which a computer is similar to, or different from, a machine such as a gasoline or electric motor.
4. Students will be able to summarize (three sentences or less) the view of the Federal Communications Minister regarding the future of computers in our society.

(B) Content

Text - Man in Society: The Future

Read the unit on "Machines That Think", pages 11-12.

(C) Teaching Strategy

Question Method - Having read the unit on "Machines that Think", answer the following five questions.

1. Where and when was the first digital computer developed?
2. List three areas where computers may be widely used in the future.
3. In what ways is a computer similar to, or different from, a machine such as a gasoline or electric motor?
4. What does the Federal Communications Minister say about the future of computers in our society?
5. What is a computer?

V Unit on "Optimism Abounds"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Student will be able to state the attitude and point of view of the writer towards the increasing computerization of our society.
2. Student will be able to list four ways in which computers are currently being used in our society.
3. Students will be able to summarize in not more than six sentences, the predictions made by the writer of the article concerning the possible future use of computers.
4. Students will be able to state the advantage of using computers in medicine.

(B) Content

Text - Man in Society: The Future

Read the unit on "Optimism Abounds", pages 13-14.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Optimism Abounds", answer the following four questions. You may refer to the text if required.

1. Briefly state the attitude, and point of view, of the writer towards the increasing computerization of our society.
2. List the ways in which computers are currently being used in our society.
3. What predictions does the writer of the article make concerning the possible future use of computers?
4. What are the advantages of using computers in medicine?

VI Unit on "Big Brother is a Machine"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the ways in which the kinds of jobs that computers handled changed over the years.
2. Students will be able to identify the technical changes that were necessary for the computers to handle more complex jobs.
3. Students will be able to explain why the computer technology was inefficient in the early stages.
4. Students will be able to write down what is meant by the term "Industrial Revolution".

(B) Content

Text - Man In Society: The Future

Read the unit on "Big Brother is a Machine", pages 14-16.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Big Brother is a Machine", answer the following four questions. You may refer to the text if required.

1. In what ways did the kind of jobs that computers handle change over the years?
2. What technical changes were necessary before computers could handle more complex jobs?
3. Why was the computer technology inefficient in the early stages?
4. Explain the term Industrial Revolution.

VII Unit on "The Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to summarize the forecast of the future, as described in the article "The Consumer Society".
2. Students will be able to explain the term "consumer society".
3. Students will be able to write down how production and consumption has changed over the past fifty (50) years.
4. Students will be able to list the new developments manufacturers and retailers foresee in the production and distribution of goods.

(B) Content

Text - Man in Society: The Future

Read the unit on "The Consumer Society", pages 17-13.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Consumer Society", answer the following four questions. You may refer to the text if required.

1. Summarize the forecast of the future as described in the article "The Consumer Society".
2. What is meant by a "consumer society"?
3. Generally speaking, how has (a) production, and (b) consumption changed over the past 50 years?
4. What new developments do manufacturers and retailers foresee in the production and distribution of goods?

VIII Unit on "Beyond the Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to give the reasons suggested in the reading to explain why some people have rejected the life style of the majority.
2. Students will be able to summarize the way in which the life style of this group differs from the majority.
3. Students will be able to state the predictions for the future made by the people being interviewed.
4. Students will be able to identify the terms used by Reich to represent the new way of thinking and the new life style.

(B) Content

Text - Man in Society: The Future

Read the unit on "Beyond the Consumer Society", pages 19-20.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Beyond the Consumer Society", answer the following four questions. You may refer to the text if required.

1. What reasons are suggested in the reading to explain why some people have rejected the life style of the majority?
2. Briefly summarize the way in which the life style of this group differs from the majority.
3. What are predictions made by the people being interviewed, for the future?
4. What is the term Reich uses to represent the new way of thinking and the new life style.

IX Unit on "The Population Bomb"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson

(A) Objectives

1. Students will be able to state the argument Chant uses to prove that Canada cannot afford to let her population continue to grow at its present rate.
2. Students will be able to describe briefly the kind of society Chant foresees if Canada allows unrestricted population growth.
3. Students will be able to give the meaning of ZPG.
4. Students will be able to identify the steps ZPG advocates for controlling population growth.

(B) Content

Text - Man in Society: The Future

Read the unit on "The Population Bomb", pages 21-22.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Population Bomb", answer the following four questions. You may refer to the text if required.

1. List the arguments Chant uses to prove that Canada cannot afford to let her population continue to grow at its present rate.
2. Describe briefly the kind of society Chant foresees if Canada allows unrestricted population growth.
3. What is ZPG?
4. What steps does ZPG advocate for controlling population growth?

X Unit on "Population: An Alternative View"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the estimated number of babies legally put to death in their mothers' wombs in 1971.
2. Students will be able to identify how the author views pro-abortionists, population projections to the year 2000.
3. Students will be able to state the year since when the population growth has been declining in North America.
4. Students will be able to quote the figure released by Statistics Canada regarding the number of children per woman.
5. Students will be able to identify the most common form of birth control today.

(B) Content

Text - Man In Society: The Future

Read the unit on "Population: An Alternative View", pages 24-27.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Population: An Alternative View", answer the following five questions. You may refer to the text if required.

1. What is the estimated number of babies legally put to death in their mother's wombs in 1971?
2. How does the author react to the pro-abortionists population projections to the year 2000?

3. Name the year since when the population growth has been declining in North America.

4. What is the figure released by Statistics Canada regarding the number of children per woman?

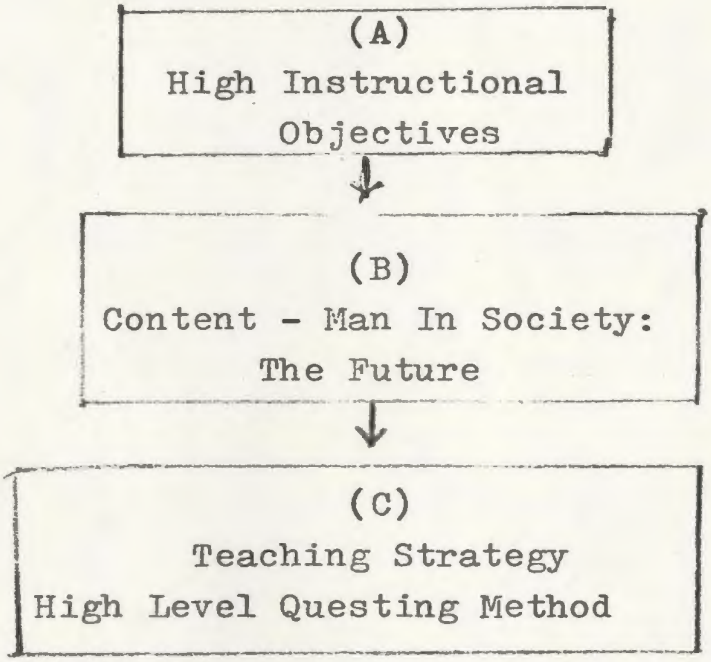
5. What is the most common form of birth control today according to your textbook?

APPENDIX B

TREATMENT 2

Instruction for Teachers: Treatment 2

The following instructional system model is used by the students in Treatment 2. It involves three major steps: (A)High Specific Objectives provided to direct student learning at this level, (B) the Content, specifying the article to be read and (C) the Teaching Strategy of high level questioning method.



Model for Treatment 2, Instructional System

At the beginning of a lesson, all students in Treatment 2 will be given the written objectives for that lesson. Instruct the students to study the objectives carefully since it lists the expected student learnings. Next direct students to read the lesson as it appears in their textbook. Students should be reminded to keep the stated objectives in mind when reading the lesson, since they serve as organizers

to direct learning. Following this, direct students to answer all the given (high level) questions related to their reading. Students should be urged to work on their own own and be informed that the questions will not be graded for marks, but will assist them to prepare for the final achievement test administered at the end of the three week experimental period. Students should not intereact with each other during the experimental period of three weeks. Teachers are asked to refrain from actively engaging in teaching but should assist in coordinating the students' use of the materials.

Instruction for Students: Treatment 2

The following instructional booklet is produced for the use of students in Treatment 2. It involves (A) Specific Objectives, (B) Instructional Content and (C) Teaching Strategy.

At the beginning of a lesson all students are provided with the written objectives for that lesson. Study these objectives carefully since it lists the expected student learnings. Next read the lesson as it appears in your textbook - Man In Society: The Future. Specific reading instructions appear under Section (B), Instructional Content. Keep the stated objectives listed under (A) in mind when reading the lesson. They serve as organizers to direct learning. Following this, answer all the given questions related to your reading. These appear under the Section (C), the Teaching Strategy. Students are not allowed to interact with each other during the experimental period of three weeks. When answering the questions, you are urged to work on your own. Your answers will not be graded for marks but are provided to help you learn the appropriate information. The final test will be administered on May 19th, 1977. The test will include all the items covered during the three week period. Good luck!

Treatment 2

I Unit on "Technology or People".

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Given the three different visions of the future, students will be able to evaluate which of the alternatives presented seems most likely to occur in light of past changes and present situations.

2. By being able to form a pattern from the parts of information provided, students will be able to specify whether the future development of George Daedalus' world is highly likely or not.

3. Students will be able to clarify whether the conveniences that new technology has provided George Daedalus with are desirable or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology or People", pages 5-6.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology or People", answer the following three questions. You may refer to the text and other appropriate materials if required.

1. The three different visions of the future are:
   (i) The optimistic view where technology is concerned as a path to utopia, universal comfort, health and prosperity.
   (ii) The pessimistic view where technology is a curse which will bring forth a doom and,
   (iii) A third vision of the technology sees man prisoner to his machines, working to keep

them in perfect running order.

Evaluate which of the above three seems most likely to occur in the light of past changes and present situations.

2. From the parts of information provided, specify whether the future development of George Daedalus' world is highly likely or not.

3. State, giving specific reasons, whether the conveniences that new technology has provided George Daedalus with, are desirable or not.

II Unit on "Life in Century 21"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson on "Life in Century 21".

(A) Objectives

1. Students will be able to evaluate whether the conveniences that technology can provide Canadians of the 21st Century are likely or not, and whether they are desirable or not.

2. Students will be able to draw upon information from various sources and by putting these together in a structure or pattern, they will be able to conclude whether the new developments help man to:

   (a) think better?
   (b) do things better?
   (c) be more comfortable?
   (d) communicate with others?
   (e) increase his knowledge?
   (f) get places faster?

(B) Content

Text - Man In Society: The Future

Read the unit on "Life in Century 21", pages 7-8.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Life in Century 21", answer the following two questions. You may refer to the text and other such appropriate materials.

1. State, giving specific reasons, whether the conveniences that new technology has provided Canadians of the 21st century are: (a) likely or not, (b) desirable or not.

2. Researching from various sources, present a case giving reasons, whether the new developments help man to:

(a) think better or not.
(b) do things better or not.
(c) be more comfortable or not.
(d) communicate with others or not.
(e) increase his knowledge or not.
(f) get places faster or not.

III Unit on "Technology will Destroy us"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to write about an episode in their lives when they were up against a technological difficulty, something that stood in their way and had to be overcome.

2. Students will be able to compare the story of George Daedalus with the article "Technology Will Destroy Us" and evaluate the strength of each case.

3. Students will be able to evaluate which of the following is most likely by preparing a short position paper arguing the possibility of one of the following:
   (a) All the countries of the world will continue to develop their technology at the present rate despite predictions of disaster.
   (b) Various countries of the world will revise or slow down technology in specific areas. This will occur only when the evidence becomes overpowering that to do otherwise will lead to complete destruction of natural resources and/or death by pollution.
   (c) Most countries will soon begin to voluntarily cut back on developing their industry and technology and become more farsighted in their approach to further development.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology will Destroy us", pages 9-10.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology will Destroy us", answer the following three questions.

You may refer to the text.

1. Write about an episode in your life (not more than a page) when you were up against a technological difficulty, something that stood in your way and had to be overcome.

2. Briefly compare (less than a page) the story of George Daedalus with the article "Technology will Destroy us" under the following headings:

   (a) What was the main theme or message?

   (b) How convincing was each case? Explain why it was or was not convincing.

3. Which of the following do you think is most likely? Prepare a short paper arguing the possibility of one of the following:

   (a) All the countries of the world will continue to develop their technology at the present rate despite predictions of disaster.

   (b) Various countries of the world will revise or slow down technology in specific areas. This will occur only when the evidence becomes overpowering that to do otherwise will lead to complete destruction of natural resources and/or death by pollution.

   (c) Most countries will soon begin to voluntarily cut back on developing their industry and technology and become more farsighted in their approach to further development.

IV Unit on "Machines That Think"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Putting together all the information provided in the text and elsewhere, students will be able to hypothesize as to whether computers will benefit or destroy mankind.

2. Students will be able to evaluate whether the future developments towards a highly computerized society is likely or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Machines That Think", pages 11-12.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Machines That Think", answer the following two questions.

1. Using all the information available, make a case arguing whether computers will benefit or destroy mankind.

2. From all the information available, evaluate whether the future developments towards a highly computerized society is likely or not.

V Unit on "Optimism Abounds"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to predict other areas where computers might be widely used in the future.
2. Students will be able to evaluate the ways in which the use of computers might have a harmful or negative effect on society.
3. Students will be able to write a researched paper on the history of the computer development.

(B) Content

Text - Man In Society: The Future

Read the unit on "Optimism Abounds", pages 13-14.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Optimism Abounds", answer the following three questions. You may refer to the text and other library materials if required.

1. Can you think of other areas where computers might be widely used in the future?
2. Is there any way in which the use of computers might have a harmful or negative effect on society?
3. Write a short research paper (one to two pages) about the history and the future of the development of the computer.

VI Unit on "Big Brother is a Machine"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to evaluate if there is any danger in becoming dependent on a machine that makes decisions than the one that sends messages or moves things.

2. Technology takes as well as gives. Students will be able to synthesis what man must give in order to reap benefits from technology.

3. Students will be able to evaluate the effects of our society if we suddenly lost the use of the electric generator, the gasoline engine, the telephone and the television.

(B) Content

Text - Man In Society: The Future

Read the unit on "Big Brother is a Machine", pages 14-16.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Big Brother is a Machine", answer the following three questions. You may refer to the text and other materials if required.

1. Is there any graver danger in becoming dependent on a machine that makes decisions than one that sends messages or moves things?

2. Technology takes as well as gives. What must man give in order to reap its benefits? What are the benefits?

3. Today, our society is dependent on technology to a much greater extent than it was 25, 50 or 100 years

VII Unit on "The Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to evaluate the change in attitude that has taken place and will take place in the consumer society.
2. Students will be able to come up with the advantages and disadvantages of being a member of a society oriented towards consumption.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Consumer Society", pages 17-18.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Consumer Society", answer the following two questions. You may refer to the text and other appropriate materials if required.

1. What is meant by Consumer Society, and what attitude changes have taken place, or may take place in the consumer society?
2. What are the advantages and disadvantages to being a member of the Consumer Society?

VIII Unit on "Beyond the Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. After comparing and contrasting the information provided by the articles "The Consumer Society" and "Beyond the Consumer Society", pages 17-20, students will be able to evaluate which view represents a strong possibility for the future of our society.

2. Students will be able to draw up the advantages and disadvantages of each life style.

(B) Content

Text - Man In Society: The Future

Read the unit on "Beyond the Consumer Society", pages 19-20.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Beyond the Consumer Society", answer the following two questions. You may refer to text and other such sources if required.

1. Compare and contrast the information provided in the articles "The Consumer Society", and "Beyond the Consumer Society". Which of the two readings do you think represents a strong possibility for the future of our society?

2. Make a list of advantages and disadvantages of each life style as you see them.

IX Unit on "The Population Bomb"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Given a list of possible ways to control population growth in Canada, students will be able to argue, giving reasons which methods they would personally support and not support and which methods do they think the majority of Canadians would support.

2. Students will be able to write a short paper (one to two pages) arguing one of the following issues:
   (a) Society should not have a say in the number of children people have.
   (b) If a society limits its population it will be in effect diminishing its own military might.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Population Bomb", pages 21-22.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Population Bomb", answer the following two questions. You may refer to the text and other such materials if required.

1. Below is a list of possible ways to control population growth:
   (a) Tax families with more than two children.
   (b) Press for education on over-populations problems at all levels - national, provincial, local.
   (c) Pressure politicians and opinion-makers to take a stand on the need for population stability.
   (d) Stop all baby bonuses.

(e) Repeal laws which restrict voluntary abortions.

(f) Give full media coverage to family planning clinics.

(g) Sterilize all parents after the birth of their second child.

Giving specific reasons; classify the above methods of dealing with this problem in Canada under the following headings:

(1) those you would personally support.

(2) those you would not support.

(3) those you think the majority of Canadians would favor or oppose.

2. Write a short paper (one to two pages) arguing one of the following issues:

(a) Society should not have a say in the number of children people have.

(b) If a society limits its population it will be in effect diminishing its own military might.

X Unit On "Population: An Alternative View"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Having examined some of the prevailing theories and projections on the right to life, students will be able to react, giving reasons to the following statement by Albert Schweitzer, "If a man loses his respect for one part of life, he will soon lose it for all life".

(B) Content

Text - Man In Society: The Future

Read the unit on "Population: An Alternative View", pages 24-27.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Population: An Alternative View", answer the following question.

1. Research into the prevailing theories and projections on the right to life and write a short paper (one to two pages) giving your reaction (agree or refute) to the statement: "If a man loses his respect for one part of life, he will soon lose it for all life". (Albert Schweitzer)

APPENDIX C

TREATMENT 3

Instruction for Teachers: Treatment 3

At the beginning of a lesson, all students in Treatment 3 will be given the written objectives (A) for that lesson. Instruct the students to study these objectives carefully since it lists the expected student learnings. Next direct students to read the lessons as it appears in their textbook. Students shall be reminded to keep the stated objectives in mind when reading the lesson, since they serve as organizers to direct learning. Following this, direct students to make personal notes related to their reading. This should help them to prepare for the final achievement test administered at the end of the three week experimental period.

Instruction for Students: Treatment 3

At the beginning of a lesson, all students are provided with the written objectives (A), for that lesson. Study these objectives carefully since it lists the expected student learning. Next read the lesson as it appears in your textbook - Man In Society: The Future. Specific reading instruction appear under Section (B), the Content. Keep the stated objectives listed under (A) in mind when reading the lesson. They serve as organizers to direct learning. Following this, make personal notes related to your reading. This should help you to prepare for the final test administered on May 19th, 1977. The test will include all the items covered during the three week period. Good luck!

Treatment 3

I Unit on "Technology or People"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to define what is meant by the term "technology".
2. Students will be able to list five conveniences that new technology provided George Daedalus with.
3. Students will be able to clarify whether the conveniences that new technology has provided George Daedalus with are desirable or not.

(B) Content

Text - Man In Society: The Future

Read the unit on"Technology or People", pages 5-6, and make notes related to this reading.

II Unit on "Life in Century 21"

Read the following objectives carefully and make a note of these when reading the lesson in the text. These objectives state what you should know by the end of the lesson on "Life in Century 21".

(A) Objectives

1. Students will be able to list five of the technological advances that Canadians of the 21st Century may be using.
2. Students will write a half-page summary of what life in Century 21st will be like.
3. Students will be able to evaluate whether the conveniences that technology can provide Canadians of 21st Century are likely or not, and whether they are desirable or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Life in Century 21", pages 7-8, and make notes related to this reading.

III Unit on "Technology will Destroy us"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to list three types of information the computers use in making predictions about the future of mankind.
2. Students will be able to summarize in not more than ten sentences, the predictions made by the computer if we continue to advance in generally the same direction technologically as we have been.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology will Destroy us", pages 9-10, and make notes related to the reading.

IV Unit on "Machines That Think"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to list three areas where computers might be widely used in the future.
2. Students will be able to write down in their own words the way in which a computer is similar to, or different from a machine such as a gasoline or electric motor.
3. Students will be able to evaluate whether the future developments towards a highly computerized society is likely or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Machines That Think", pages 11-12 and make notes related to this reading.

V Unit on "Optimism Abounds"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the attitude and point of view, of the writer towards the increasing computerization of our society.
2. Students will be able to list four ways in which computers are currently being used in our society.
3. Students will be able to evaluate the ways in which the use of computers might have a harmful or negative effect on society.

(B) Content

Text - Man In Society: The Future

Read the unit on "Optimism Abounds", pages 13-14, and make notes related to this reading.

VI Unit on "Big Brother is a Machine"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the ways in which the kinds of jobs that computers handled changed over the year.
2. Students will be able to explain why the computer technology was inefficient in the early stages.
3. Students will be able to evaluate if there is any danger in becoming dependent on a machine that makes decisions than the one that sends messages or moves things.

(B) Content

Text - Man in Society: The Future

Read the unit on "Big Brother is a Machine", pages 14-16 and make notes related to this reading.

VII Unit on "The Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to summarize the forecast of the future, as described in the article "The Consumer Society".
2. Students will be able to write down how production and consumption has changed over the past fifty (50) years.
3. Students will be able to come up with the advantages and disadvantages of being a member of a society oriented towards consumption.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Consumer Society", pages 17-18 , and make notes related to this reading.

VIII Unit on "Beyond the Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to give the reasons suggested in the reading to explain why some people have rejected the life style of the majority.

2. Students will be able to summarize the way in which the life style of this group differs from the majority.

(B) Content

Text - Man In Society: The Future

Read the unit on "Beyond the Consumer Society", pages 19-20 and make notes related to this reading.

IX Unit on "The Population Bomb"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the argument Chant uses to prove that Canada cannot afford to let her population continue to grow at its present rate.
2. Students will be able to identify the steps ZPG advocates for controlling population growth.
3. Students will be able to describe briefly the kind of society Chant foresees if Canada allows unrestricted population growth.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Population Bomb", pages 21-22, and make notes related to this reading.

X Unit on "Population: An Alternative View"

Read the following carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the estimated number of babies legally put to death in their mothers' wombs in 1971.

2. Students will be able to state the year since when the population growth has been declining in North America.

(B) Content

Text - Man In Society: The Future

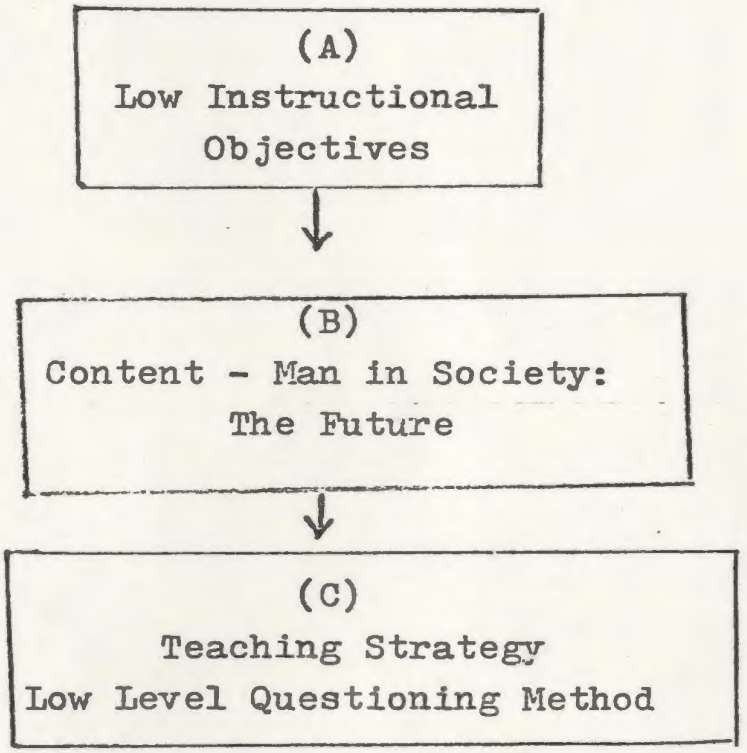
Read the unit on "Population: An Alternative View", pages 24-27, and make notes related to this reading.

APPENDIX D

TREATMENT 1

Instruction for Teachers: Treatment 1

The following instructional system model is used by the students in Treatment 1. It involves three major steps: (A) Low specific objectives provided to direct student learning at this level, (B) the Content, specifying the article to be read and (C) the Teaching Strategy of low level questioning method.



Model for treatment 1, Instructional System

At the beginning of a lesson, all students in Treatment 1 will be given the written objectives for that lesson. Instruct the students to study the objectives carefully since it lists the expected student learnings. Next, direct the students to read the lesson as it appears

in their textbook. They should be reminded to keep the stated objectives in mind when reading the lesson since they serve as organizers to direct learning. Following this, direct students to answer all the given (low level) questions related to their reading. Students should be urged to work on their own and be informed that the questions will not be graded for marks but will assist them to prepare for the final achievement test administered at the end of the three week experimental period. Students should not interact with each other during the experimental period of three weeks. Teachers are asked to refrain from actively engaging in teaching but should assist in coordinating the students' use of the materials.

Instruction for Students: Treatment 1

The following instructional booklet is produced for the use of students in Treatment 1. It involves (A) specific Objectives, (B) Content, and (C) Teaching Strategy.

At the beginning of a lesson, all students will be provided with the written objectives for that lesson. Study these objectives carefully since it lists the expected student learnings. Next read the lesson as it appears in your textbook - Man in Society: The Future. Specific reading instructions appear under Section (B) Content. Keep the stated objectives listed under (A) in mind when reading the lesson. They serve as organizers to direct learning. Following this, answer all the given questions related to your reading. These appear under Section (C), teaching strategy. Students are not allowed to interact with each other during the experimental period of three weeks. When answering questions, you are urged to work on your own. Your answers will not be graded for marks but are provided to help you learn the appropriate information. The final test will be administered in May 19th, 1977. It will include all the items covered during the three week period. Good luck!

Treatment 1

I Unit on "Technology or People"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to define what is meant by the term "technology".
2. Students will be able to list five conveniences that new technology provided George Daedalus with.
3. Students will be able to state in 2-3 sentences how Robert Collins sees the future.
4. Students will be able to summarize in not more than 15 sentences, the predictions made by Robert Collins.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology or people", pages 5-6.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology or people", answer the following five questions. You may refer to the text if required.

1. What is technology? Give a brief definition of it.
2. List five (5) conveniences that are provided for George Daedalus by the new technology.
3. Is Robert Collins' theory of the future optimistic or pessimistic? Give three reasons why.

4. What are the predictions made by Robert Collins? Summarize them in not more than fifteen sentences.

5. Robert Collins states that in George Daedalus' era, immortality may be worth having. From the information provided on page 6, interpret how the author would answer that question.

II Unit on "Life in Century 21"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson on "Life in Century 21"

(A) Objectives

1. Students will be able to list five of the technological advances that Canadians of the 21st century may be using.
2. Students will be able to write down whether the Canadians living in the 21st century will have more or less leisure time as compared to us (knowledge of theory and structure and extrapolation.
3. Students will write a half-page summary of what life in century 21st will be like.
4. Students will be able to separate all the technological advances mentioned in the reading into two lists:
   (a) those that are invented now, but have not been put into popular use.
   (b) those that will depend on future inventions or technological advances.

(B) Content

Text - Man In Society: The Future

Read the unit on "Life in Century 21", pages 7-8.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Life in Century 21", answer the following five questions. You may refer to the text if required.

1. List five (5) technological advances which may be enjoyed by the Canadians of the 21st century.

2. Will the Canadians living in the 21st century have more or less leisure time compared to us, living in the 20th century?

3. Summarize in not more than half a page what life will be like in the 21st century.

4. List in two columns, (a) all technological devices mentioned that have been invented but not yet in popular use, (b) all those mentioned that will depend on future inventions.

5. Write a summary (not more than seven sentences) describing how you would entertain a friend joining you for a dinner in the 21st century.

III Unit on "Technology will destroy us"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to list three types of information the computers use in making predictions about the future of mankind.

2. Students will be able to write down in their words the solution offered by the computer, for the prevention of future destruction.

3. Students will be able to summarize, in not more than 10 sentences, the predictions made by the computer if we continue to advance in generally the same direction technologically as we have been.

4. Students will be able to assert in writing whether the writer believes that the computer's recommendations will be followed or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology will destroy us", pages 9-10.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology will destroy us", answer the following five questions. You may refer to the text.

1. List three types of information the computers use in making predictions about the future of mankind.

2. In your own words, state the computer's solution for the prevention of future destruction.

3. Summarize (in not more than 10 sentences) the predictions made by the computer if we continue to advance in generally the same directions, technologically as we have been.

4. What do the computers predict will happen given each of the following situations:

   (a) If we increase our investment in industry and technology, especially in the under-developed countries.

   (b) If we cut our birthrate in half.

   (c) If we, in addition to reducing our birthrate, cut down on food production, industry, and technological investment and development.

5. Does the writer believe that the computer's recommendations will be followed. Why, or why not?

IV Unit on "Machines That Think"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to write the year and place in which the first digital computer was developed.
2. Students will be able to list three areas where computers might be widely used in the future.
3. Students will be able to write in their own words the way in which a computer is similar to, or different from, a machine such as a gasoline or electric motor.
4. Students will be able to summarize (three sentences or less) the view of the Federal Communications Minister regarding the future of computers in our society.

(B) Content

Text - Man in Society: The Future

Read the unit on "Machines That Think", pages 11-12.

(C) Teaching Strategy

Question Method - Having read the unit on "Machines that Think", answer the following five questions.

1. Where and when was the first digital computer developed?
2. List three areas where computers may be widely used in the future.
3. In what ways is a computer similar to, or different from, a machine such as a gasoline or electric motor?
4. What does the Federal Communications Minister say about the future of computers in our society?
5. What is a computer?

V Unit on "Optimism Abounds"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Student will be able to state the attitude and point of view of the writer towards the increasing computerization of our society.
2. Student will be able to list four ways in which computers are currently being used in our society.
3. Students will be able to summarize in not more than six sentences, the predictions made by the writer of the article concerning the possible future use of computers.
4. Students will be able to state the advantage of using computers in medicine.

(B) Content

Text - Man in Society: The Future

Read the unit on "Optimism Abounds", pages 13-14.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Optimism Abounds", answer the following four questions. You may refer to the text if required.

1. Briefly state the attitude, and point of view, of the writer towards the increasing computerization of our society.
2. List the ways in which computers are currently being used in our society.
3. What predictions does the writer of the article make concerning the possible future use of computers?
4. What are the advantages of using computers in medicine?

VI Unit on "Big Brother is a Machine"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the ways in which the kinds of jobs that computers handled changed over the years.
2. Students will be able to identify the technical changes that were necessary for the computers to handle more complex jobs.
3. Students will be able to explain why the computer technology was inefficient in the early stages.
4. Students will be able to write down what is meant by the term "Industrial Revolution".

(B) Content

Text - Man In Society: The Future

Read the unit on "Big Brother is a Machine", pages 14-16.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Big Brother is a Machine", answer the following four questions. You may refer to the text if required.

1. In what ways did the kind of jobs that computers handle change over the years?
2. What technical changes were necessary before computers could handle more complex jobs?
3. Why was the computer technology inefficient in the early stages?
4. Explain the term Industrial Revolution.

VII Unit on "The Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to summarize the forecast of the future, as described in the article "The Consumer Society".
2. Students will be able to explain the term "consumer society".
3. Students will be able to write down how production and consumption has changed over the past fifty (50) years.
4. Students will be able to list the new developments manufacturers and retailers foresee in the production and distribution of goods.

(B) Content

Text - Man in Society: The Future

Read the unit on "The Consumer Society", pages 17-18.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Consumer Society", answer the following four questions. You may refer to the text if required..

1. Summarize the forecast of the future as described in the article "The Consumer Society".
2. What is meant by a "consumer society"?
3. Generally speaking, how has (a) production, and (b) consumption changed over the past 50 years?
4. What new developments do manufacturers and retailers foresee in the production and distribution of goods?

VIII Unit on "Beyond the Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to give the reasons suggested in the reading to explain why some people have rejected the life style of the majority.
2. Students will be able to summarize the way in which the life style of this group differs from the majority.
3. Students will be able to state the predictions for the future made by the people being interviewed.
4. Students will be able to identify the terms used by Reich to represent the new way of thinking and the new life style.

(B) Content

Text - Man in Society: The Future

Read the unit on "Beyond the Consumer Society", pages 19-20.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Beyond the Consumer Society", answer the following four questions. You may refer to the text if required.

1. What reasons are suggested in the reading to explain why some people have rejected the life style of the majority?
2. Briefly summarize the way in which the life style of this group differs from the majority.
3. What are predictions made by the people being interviewed, for the future?
4. What is the term Reich uses to represent the new way of thinking and the new life style.

IX Unit on "The Population Bomb"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson

(A) Objectives

1. Students will be able to state the argument Chant uses to prove that Canada cannot afford to let her population continue to grow at its present rate.
2. Students will be able to describe briefly the kind of society Chant foresees if Canada allows unrestricted population growth.
3. Students will be able to give the meaning of ZPG.
4. Students will be able to identify the steps ZPG advocates for controlling population growth.

(B) Content

Text - Man in Society: The Future

Read the unit on "The Population Bomb", pages 21-22.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Population Bomb", answer the following four questions. You may refer to the text if required.

1. List the arguments Chant uses to prove that Canada cannot afford to let her population continue to grow at its present rate.
2. Describe briefly the kind of society Chant foresees if Canada allows unrestricted population growth.
3. What is ZPG?
4. What steps does ZPG advocate for controlling population growth?

X Unit on "Population: An Alternative View"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the estimated number of babies legally put to death in their mothers' wombs in 1971.
2. Students will be able to identify how the author views pro-abortionists, population projections to the year 2000.
3. Students will be able to state the year since when the population growth has been declining in North America.
4. Students will be able to quote the figure released by Statistics Canada regarding the number of children per woman.
5. Students will be able to identify the most common form of birth control today.

(B) Content

Text - Man In Society: The Future

Read the unit on "Population: An Alternative View", pages 24-27.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Population: An Alternative View", answer the following five questions. You may refer to the text if required.

1. What is the estimated number of babies legally put to death in their mother's wombs in 1971?
2. How does the author react to the pro-abortionists population projections to the year 2000?

3. Name the year since when the population growth has been declining in North America.

4. What is the figure released by Statistics Canada regarding the number of children per woman?

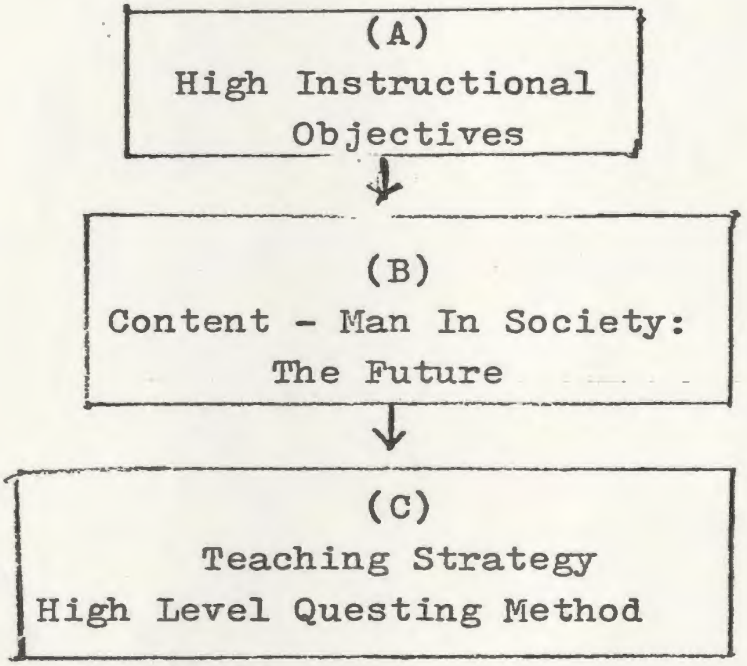
5. What is the most common form of birth control today according to your textbook?

APPENDIX E

TREATMENT 2

Instruction for Teachers: Treatment 2

The following instructional system model is used by the students in Treatment 2. It involves three major steps: (A)High Specific Objectives provided to direct student learning at this level, (B) the Content, specifying the article to be read and (C) the Teaching Strategy of high level questioning method.



Model for Treatment 2, Instructional System

At the beginning of a lesson, all students in Treatment 2 will be given the written objectives for that lesson. Instruct the students to study the objectives carefully since it lists the expected student learnings. Next direct students to read the lesson as it appears in their textbook. Students should be reminded to keep the stated objectives in mind when reading the lesson, since they serve as organizers

to direct learning. Following this, direct students to answer all the given (high level) questions related to their reading. Students should be urged to work on their own own and be informed that the questions will not be graded for marks, but will assist them to prepare for the final achievement test administered at the end of the three week experimental period. Students should not intereact with each other during the experimental period of three weeks. Teachers are asked to refrain from actively engaging in teaching but should assist in coordinating the students' use of the materials.

Instruction for Students: Treatment 2

The following instructional booklet is produced for the use of students in Treatment 2. It involves (A) Specific Objectives, (B) Instructional Content and (C) Teaching Strategy.

At the beginning of a lesson all students are provided with the written objectives for that lesson. Study these objectives carefully since it lists the expected student learnings. Next read the lesson as it appears in your textbook - Man In Society: The Future. Specific reading instructions appear under Section (B), Instructional Content. Keep the stated objectives listed under (A) in mind when reading the lesson. Theyserve as organizers to direct learning. Following this, answer all the given questions related to your reading. These appear under the Section (C), the Teaching Strategy. Students are not allowed to interact with each other during the experimental period of three weeks. When answering the questions, you are urged to work on your own. Your answers will not be graded for marks but are provided to help you learn the appropriate information. The final test will be administered on May 19th, 1977. The test will include all the items covered during the three week period. Good luck!

Treatment 2

I Unit on "Technology or People".

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Given the three different visions of the future, students will be able to evaluate which of the alternatives presented seems most likely to occur in light of past changes and present situations.

2. By being able to form a pattern from the parts of information provided, students will be able to specify whether the future development of George Daedalus' world is highly likely or not.

3. Students will be able to clarify whether the conveniences that new technology has provided George Daedalus with are desirable or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology or People", pages 5-6.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology or People", answer the following three questions. You may refer to the text and other appropriate materials if required.

1. The three different visions of the future are:
   (i) The optimistic view where technology is concerned as a path to utopia, universal comfort, health and prosperity.
   (ii) The pessimistic view where technology is a curse which will bring forth a doom and,
   (iii) A third vision of the technology sees man prisoner to his machines, working to keep

them in perfect running order.

Evaluate which of the above three seems most likely to occur in the light of past changes and present situations.

2. From the parts of information provided, specify whether the future development of George Daedalus' world is highly likely or not.

3. State, giving specific reasons, whether the conveniences that new technology has provided George Daedalus with, are desirable or not.

II Unit on "Life in Century 21"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson on "Life in Century 21".

(A) Objectives

1. Students will be able to evaluate whether the conveniences that technology can provide Canadians of the 21st Century are likely or not, and whether they are desirable or not.

2. Students will be able to draw upon information from various sources and by putting these together in a structure or pattern, they will be able to conclude whether the new developments help man to:

   (a) think better?
   (b) do things better?
   (c) be more comfortable?
   (d) communicate with others?
   (e) increase his knowledge?
   (f) get places faster?

(B) Content

Text - Man In Society: The Future

Read the unit on "Life in Century 21", pages 7-8.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Life in Century 21", answer the following two questions. You may refer to the text and other such appropriate materials.

1. State, giving specific reasons, whether the conveniences that new technology has provided Canadians of the 21st century are: (a) likely or not, (b) desirable or not.

2. Researching from various sources, present a case giving reasons, whether the new developments help man to:

(a) think better or not.
(b) do things better or not.
(c) be more comfortable or not.
(d) communicate with others or not.
(e) increase his knowledge or not.
(f) get places faster or not.

III Unit on "Technology will Destroy us"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to write about an episode in their lives when they were up against a technological difficulty, something that stood in their way and had to be overcome.

2. Students will be able to compare the story of George Daedalus with the article "Technology Will Destroy Us" and evaluate the strength of each case.

3. Students will be able to evaluate which of the following is most likely by preparing a short position paper arguing the possibility of one of the following:
   (a) All the countries of the world will continue to develop their technology at the present rate despite predictions of disaster.
   (b) Various countries of the world will revise or slow down technology in specific areas. This will occur only when the evidence becomes overpowering that to do otherwise will lead to complete destruction of natural resources and/or death by pollution.
   (c) Most countries will soon begin to voluntarily cut back on developing their industry and technology and become more farsighted in their approach to further development.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology will Destroy us", pages 9-10.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Technology will Destroy us", answer the following three questions.

You may refer to the text.

1. Write about an episode in your life (not more than a page) when you were up against a technological difficulty, something that stood in your way and had to be overcome.

2. Briefly compare (less than a page) the story of George Daedalus with the article "Technology will Destroy us" under the following headings:

   (a) What was the main theme or message?

   (b) How convincing was each case? Explain why it was or was not convincing.

3. Which of the following do you think is most likely? Prepare a short paper arguing the possibility of one of the following:

   (a) All the countries of the world will continue to develop their technology at the present rate despite predictions of disaster.

   (b) Various countries of the world will revise or slow down technology in specific areas. This will occur only when the evidence becomes overpowering that to do otherwise will lead to complete destruction of natural resources and/or death by pollution.

   (c) Most countries will soon begin to voluntarily cut back on developing their industry and technology and become more farsighted in their approach to further development.

IV Unit on "Machines That Think"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Putting together all the information provided in the text and elsewhere, students will be able to hypothesize as to whether computers will benefit or destroy mankind.

2. Students will be able to evaluate whether the future developments towards a highly computerized society is likely or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Machines That Think", pages 11-12.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Machines That Think", answer the following two questions.

1. Using all the information available, make a case arguing whether computers will benefit or destroy mankind.

2. From all the information available, evaluate whether the future developments towards a highly computerized society is likely or not.

V Unit on "Optimism Abounds"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to predict other areas where computers might be widely used in the future.
2. Students will be able to evaluate the ways in which the use of computers might have a harmful or negative effect on society.
3. Students will be able to write a researched paper on the history of the computer development.

(B) Content

Text - Man In Society: The Future

Read the unit on "Optimism Abounds", pages 13-14.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Optimism Abounds", answer the following three questions. You may refer to the text and other library materials if required.

1. Can you think of other areas where computers might be widely used in the future?
2. Is there any way in which the use of computers might have a harmful or negative effect on society?
3. Write a short research paper (one to two pages) about the history and the future of the development of the computer.

VI Unit on "Big Brother is a Machine"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to evaluate if there is any danger in becoming dependent on a machine that makes decisions than the one that sends messages or moves things.

2. Technology takes as well as gives. Students will be able to synthesis what man must give in order to reap benefits from technology.

3. Students will be able to evaluate the effects of our society if we suddenly lost the use of the electric generator, the gasoline engine, the telephone and the television.

(B) Content

Text - Man In Society: The Future

Read the unit on "Big Brother is a Machine", pages 14-16.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Big Brother is a Machine", answer the following three questions. You may refer to the text and other materials if required.

1. Is there any graver danger in becoming dependent on a machine that makes decisions than one that sends messages or moves things?

2. Technology takes as well as gives. What must man give in order to reap its benefits? What are the benefits?

3. Today, our society is dependent on technology to a much greater extent than it was 25, 50 or 100 years

VII Unit on "The Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to evaluate the change in attitude that has taken place and will take place in the consumer society.
2. Students will be able to come up with the advantages and disadvantages of being a member of a society oriented towards consumption.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Consumer Society", pages 17-18.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Consumer Society", answer the following two questions. You may refer to the text and other appropriate materials if required.

1. What is meant by Consumer Society, and what attitude changes have taken place, or may take place in the consumer society?
2. What are the advantages and disadvantages to being a member of the Consumer Society?

VIII Unit on "Beyond the Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. After comparing and contrasting the information provided by the articles "The Consumer Society" and "Beyond the Consumer Society", pages 17-20, students will be able to evaluate which view represents a strong possibility for the future of our society.

2. Students will be able to draw up the advantages and disadvantages of each life style.

(B) Content

Text - Man In Society: The Future

Read the unit on "Beyond the Consumer Society", pages 19-20.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Beyond the Consumer Society", answer the following two questions. You may refer to text and other such sources if required.

1. Compare and contrast the information provided in the articles "The Consumer Society", and "Beyond the Consumer Society". Which of the two readings do you think represents a strong possibility for the future of our society?

2. Make a list of advantages and disadvantages of each life style as you see them.

IX Unit on "The Population Bomb"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Given a list of possible ways to control population growth in Canada, students will be able to argue, giving reasons which methods they would personally support and not support and which methods do they think the majority of Canadians would support.

2. Students will be able to write a short paper (one to two pages) arguing one of the following issues:
   (a) Society should not have a say in the number of children people have.
   (b) If a society limits its population it will be in effect diminishing its own military might.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Population Bomb", pages 21-22.

(C) Teaching Strategy

Questioning Method - Having read the unit on "The Population Bomb", answer the following two questions. You may refer to the text and other such materials if required.

1. Below is a list of possible ways to control population growth:
   (a) Tax families with more than two children.
   (b) Press for education on over-populations problems at all levels - national, provincial, local.
   (c) Pressure politicians and opinion-makers to take a stand on the need for population stability.
   (d) Stop all baby bonuses.

(e) Repeal laws which restrict voluntary abortions.

(f) Give full media coverage to family planning clinics.

(g) Sterilize all parents after the birth of their second child.

Giving specific reasons; classify the above methods of dealing with this problem in Canada under the following headings:

(1) those you would personally support.

(2) those you would not support.

(3) those you think the majority of Canadians would favor or oppose.

2. Write a short paper (one to two pages) arguing one of the following issues:

(a) Society should not have a say in the number of children people have.

(b) If a society limits its population it will be in effect diminishing its own military might.

X Unit On "Population: An Alternative View"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Having examined some of the prevailing theories and projections on the right to life, students will be able to react, giving reasons to the following statement by Albert Schweitzer, "If a man loses his respect for one part of life, he will soon lose it for all life".

(B) Content

Text - Man In Society: The Future

Read the unit on "Population: An Alternative View", pages 24-27.

(C) Teaching Strategy

Questioning Method - Having read the unit on "Population: An Alternative View", answer the following question.

1. Research into the prevailing theories and projections on the right to life and write a short paper (one to two pages) giving your reaction (agree or refute) to the statement: "If a man loses his respect for one part of life, he will soon lose it for all life". (Albert Schweitzer)

APPENDIX F

TREATMENT 3

Instruction for Teachers: Treatment 3

At the beginning of a lesson, all students in Treatment 3 will be given the written objectives (A) for that lesson. Instruct the students to study these objectives carefully since it lists the expected student learnings. Next direct students to read the lessons as it appears in their textbook. Students shall be reminded to keep the stated objectives in mind when reading the lesson, since they serve as organizers to direct learning. Following this, direct students to make personal notes related to their reading. This should help them to prepare for the final achievement test administered at the end of the three week experimental period.

Instruction for Students: Treatment 3

At the beginning of a lesson, all students are provided with the written objectives (A), for that lesson. Study these objectives carefully since it lists the expected student learning. Next read the lesson as it appears in your textbook - Man In Society: The Future. Specific reading instruction appear under Section (B), the Content. Keep the stated objectives listed under (A) in mind when reading the lesson. They serve as organizers to direct learning. Following this, make personal notes related to your reading. This should help you to prepare for the final test administered on May 18th, 1977. The test will include all the items covered during the three week period. Good luck!

Treatment 3

I Unit on "Technology or People"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to define what is meant by the term "technology".
2. Students will be able to list five conveniences that new technology provided George Daedalus with.
3. Students will be able to clarify whether the conveniences that new technology has provided George Daedalus with are desirable or not.

(B) Content

Text - Man In Society: The Future

Read the unit on"Technology or People", pages 5-6, and make notes related to this reading.

II Unit on "Life in Century 21"

Read the following objectives carefully and make a note of these when reading the lesson in the text. These objectives state what you should know by the end of the lesson on "Life in Century 21".

(A) Objectives

1. Students will be able to list five of the technological advances that Canadians of the 21st Century may be using.
2. Students will write a half-page summary of what life in Century 21st will be like.
3. Students will be able to evaluate whether the conveniences that technology can provide Canadians of 21st Century are likely or not, and whether they are desirable or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Life in Century 21", pages 7-8, and make notes related to this reading.

III Unit on "Technology will Destroy us"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to list three types of information the computers use in making predictions about the future of mankind.

2. Students will be able to summarize in not more than ten sentences, the predictions made by the computer if we continue to advance in generally the same direction technologically as we have been.

(B) Content

Text - Man In Society: The Future

Read the unit on "Technology will Destroy us", pages 9-10, and make notes related to the reading.

IV Unit on "Machines That Think"

Read the following objectives carefully and note these when reading the lesson in the text. These objectives state what you should master by the end of the lesson.

(A) Objectives

1. Students will be able to list three areas where computers might be widely used in the future.
2. Students will be able to write down in their own words the way in which a computer is similar to, or different from a machine such as a gasoline or electric motor.
3. Students will be able to evaluate whether the future developments towards a highly computerized society is likely or not.

(B) Content

Text - Man In Society: The Future

Read the unit on "Machines That Think", pages 11-12 and make notes related to this reading.

V Unit on "Optimism Abounds"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the attitude and point of view, of the writer towards the increasing computerization of our society.
2. Students will be able to list four ways in which computers are currently being used in our society.
3. Students will be able to evaluate the ways in which the use of computers might have a harmful or negative effect on society.

(B) Content

Text - Man In Society: The Future

Read the unit on "Optimism Abounds", pages 13-14, and make notes related to this reading.

VI Unit on "Big Brother is a Machine"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the ways in which the kinds of jobs that computers handled changed over the year.
2. Students will be able to explain why the computer technology was inefficient in the early stages.
3. Students will be able to evaluate if there is any danger in becoming dependent on a machine that makes decisions than the one that sends messages or moves things.

(B) Content

Text - Man in Society: The Future

Read the unit on "Big Brother is a Machine", pages 14-16 and make notes related to this reading.

VII Unit on "The Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to summarize the forecast of the future, as described in the article "The Consumer Society".
2. Students will be able to write down how production and consumption has changed over the past fifty (50) years.
3. Students will be able to come up with the advantages and disadvantages of being a member of a society oriented towards consumption.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Consumer Society", pages 17-18 , and make notes related to this reading.

VIII Unit on "Beyond the Consumer Society"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to give the reasons suggested in the reading to explain why some people have rejected the life style of the majority.

2. Students will be able to summarize the way in which the life style of this group differs from the majority.

(B) Content

Text - Man In Society: The Future

Read the unit on "Beyond the Consumer Society", pages 19-20 and make notes related to this reading.

IX Unit on "The Population Bomb"

Read the following objectives carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the argument Chant uses to prove that Canada cannot afford to let her population continue to grow at its present rate.
2. Students will be able to identify the steps ZPG advocates for controlling population growth.
3. Students will be able to describe briefly the kind of society Chant foresees if Canada allows unrestricted population growth.

(B) Content

Text - Man In Society: The Future

Read the unit on "The Population Bomb", pages 21-22, and make notes related to this reading.

X Unit on "Population: An Alternative View"

Read the following carefully, and note these when reading the lesson in the text. These objectives state what you should know by the end of the lesson.

(A) Objectives

1. Students will be able to state the estimated number of babies legally put to death in their mothers' wombs in 1971.
2. Students will be able to state the year since when the population growth has been declining in North America.

(B) Content

Text - Man In Society: The Future

Read the unit on "Population: An Alternative View", pages 24-27, and make notes related to this reading.

APPENDIX G

Table of Specifications: 40 Item Multiple Choice Achievement Test

Unit Content from text	Knowledge & Application	Synthesis & Evaluation	Total
1. Technology or people	2, 4 7.5%	1, 3 2.5%	10%
2. Life in 21st Century	6 2.5%	5, 7, 8 7.5%	10%
3. Technology will destroy us	10, 9 2.5%	2.5%	5%
4. A Computerized Society	11, 13, 34 7.5%	12, 39 5%	12.5%
5. Optimism Abounds	14 5%	15, 33, 40 5%	10%
6. Big Brother is Machine	16, 17, 18 5%	19, 20 7.5%	12.5%
7. The Consumer Society	22 5%	21, 23 2.5%	7.5%
8. Beyond the Consumer Society	24, 26 5%	25, 27, 28 10%	15%
9. "Big as it is Canada doesn't need more people"	29, 30 5%	31, 32 5%	10%
10. Population: An Alternative View	36, 37, 38 5%	35 2.5%	7.5%
Total	50%	50%	100%

APPENDIX H

Grade X

Final Test on the Future

Directions: Read the following questions carefully and mark the best answer. Your score will be the number of questions answered correctly.

1. Which of these statements is most consistent with your analysis and understanding of the role of "technology"?

   (1) It helps us to cope with overpopulation, poverty, pollution and all the other human problems.
   (2) It is a villain that is hurtling us into economic collapse and a new dark age.
   (3) Technology has become the handmaiden of growth and consumption and is beyond human control.
   (4) For both good and for ill, technology affects every person on this planet, but is still controlled by societal norms.

2. Which of these statements represents Robert Collins' theory of the future?

   (1) Technological change is occurring at such a mind staggering rate, it is difficult to know in what direction it will take.
   (2) Robert Collins' theory is similar to Alvin Toffler's Future Shock.
   (3) We will enjoy the wonderful world of technology.
   (4) Every technological advance brings the world closer to doom.

3. Which of the following best hypothesises why the future development of George Daedalus' world is likely?

   (1) Because the irreversable technology is already progressing in that direction.
   (2) Because man can't cope up with his problems.
   (3) Because man is not aware of its disadvantages.
   (4) Because society is people oriented rather than product oriented.

4. Two of the conveniences provided for George Daedalus by the new technology are:

   (1) Ability to control weather, and have computerized housekeepers.
   (2) Ability to control weather and gravity.
   (3) Ability to control wind storms and eliminate death.
   (4) Potential to virtually wipe out diseases and have computerized housekeepers.

5. From the limited information available, it can be hypothesized that Canadians living in the 21st century will have more leisure time compared to us because:

   (1) Of the rapid population growth and comparative decline in availability of jobs.
   (2) We will be educated for leisure rather than for work oriented society.
   (3) Technology will do the major work for us.
   (4) Electronics will do all the thinking and work for us.

6. Two of the technological devices that have been invented but not yet in popular use are:

   (1) Dial yourself video news system and computerized libraries.
   (2) 3-D television and anti-fatigue brain stimulating pill.
   (3) Self-serve cab stands and auto market.
   (4) Computerized travel agent facilities and video phones.

7. It can be argued that new developments will help man to increase his knowledge because:

   (1) It will do the thinking for man.
   (2) Man will have invented a "memory pill".
   (3) It will provide facilities from which knowledge can be easily obtained.
   (4) It will produce the teacher-machines which will be more effective than the present system.

8. Some of the predicted conveniences that may be provided to Canadians of 21st century are not likely to be achieved because:

   (1) We do not have the brain-power and resources to invent such far out things.
   (2) We lack advanced technology.
   (3) Canadian society will object to such drastic changes that endanger its stability.
   (4) We do not spend enough money in science to help develop such inventions.

9. The computers predict that the quality of our life will decline steadily if we continue to advance in generally the same direction technologically as we have been. One reason for this prediction is that:

   (1) The world population growth is uncontrollable.
   (2) Natural resources are declining.
   (3) Technology destroys society.
   (4) The way we have been using technology, we have already reached its peak that cannot continue.

10. One of computers' solutions for the prevention of future destruction is:

(1) We cut food production by 35 percent.
(2) We increase food production by 35 percent.
(3) We reduce our investment in technology and industry by 40 percent.
(4) We cut birth rate by 70 percent.

11. The first digital computer was developed at:
(1) Harlow University in 1943.
(2) Harvard University in 1944.
(3) Harlow University in 1944.
(4) McGill University in 1943.

12. In his address, Robert Stanbury referred to the creation of a computerized society. Evaluating his predictions one could argue for:

(1) The revolutionary take over of Electronic Technology in our society.
(2) The destruction of our civilization.
(3) The revolutionary use of Electronic Technology.
(4) The creation of computerized educational system.

13. The two areas in which computers currently assist are:

(1) As Travel Agent and as Economist.
(2) In Archeology and Food Technology.
(3) In Business and Education.
(4) In Banking and Agriculture.

14. One of the advantages of using computer in medicine is:

(1) We can eliminate diseases and death.
(2) Treatments will be available to all, at anytime and any place without a doctor.
(3) The time a patient spends in hospital can be reduced.
(4) Computers are more dependable than human doctors.

15. Computers can have negative and positive effect on society. One of the basic areas where it might have a negative effect is:

(1) It stops us from doing our own thinking.
(2) It needs to be reprogrammed for every new task.
(3) That the amount of information available to it can become astronomical.
(4) It can undermine human potential and make him dependent on it.

16. The first important thing to do when working with computers is to:

(1) Programme it to carry out its functions.
(2) Make sure all its systems are connected.
(3) Make sure it is connected to its main data center.
(4) Understand its advantages and limitations.

17. The computer technology was inefficient in the early stages because:

(1) They were too bulky and hard to manipulate.
(2) They needed to be reprogrammed for every new task.
(3) There were only a few main data centers available.
(4) Not all people could understand the computer language, and as a result, did not use it.

18. Industrial Revolution can be defined as:

(1) The economic revolution that took place in England in 1660's.
(2) Alteration in industrial or production methods in direction of machine production.
(3) The economic policy that was dependent on the exploitation of human labor.
(4) The gradual development of industrial technology.

19. What would be the effect on running our society if we suddenly lost the electric generator? We would -

(1) Return to the Bronze-Age Society.
(2) Replace it by thermo neuclear energy.
(3) Not be affected much, since we depend more on gas than on electricity for energy.
(4) Lose the comforts of our century.

20. Technology takes as well as gives. One of the "things" man must give in order to reap its benefits is:

(1) Work for it by adopting the rules of systemization and mechanization.
(2) Adopt it as big brother.
(3) Let it do the thinking and programming for mankind.
(4) Provide total attention when it is in developmental stage.

21. Which of these statements is most consistent with your analysis and evaluation of a consumer society?

(1) Its citizens on the whole believe in capitalism and the policy of future orientation.
(2) It is facilitating the survival of credit society with its buy now, pay later philosophy.
(3) If it weren't for the advertising industries, there would be no consumer society.
(4) It citizens on the whole believe in hard work, sound investments and competition.

22. One of the new developments manufacturers foresee in the production of goods is:

(1) It will no longer be necessary to go to the stores to purchase goods.
(2) Computerized robots will do the manual work related to assembly line production.
(3) It will not be necessary to accept standardized assembly line production.
(4) The old hard-sell advertising methods will not exist in business.

23. One of the advantages of being a member of a Consumer Society may be:

(1) Advertising industry, as well as cash flow, can flourish.
(2) It is rewarding to be competitive in nature.
(3) It makes us work hard.
(4) Availability of products and choice magnifies.

24. The people who rejected the idea of consumption during the 1960's and 70's were called:

(1) Beatniks.
(2) Swamies.
(3) Consciousness III.
(4) Hippies.

25. Evaluating the philosophy of the "non-consumer" minority, it may be argued that they reject the life style of the majority because:

(1) They are revolutionary in nature and philosophy.
(2) They reject the philosophy of competition and capitalism.
(3) They believe in Charles Reich's philosophy.
(4) They believe it is wasteful to produce things they do not need.

26. The term Reich uses to represent the new way of thinking and life style is:

(1) The Greening of America.
(2) Beatniks.
(3) Alfa-gamma.
(4) Consciousness III.

27. Unlike the Consumer Society, beyond the Consumer Society offers many advantages to individuals. One of the basic advantages underlying this later society is:

(1) People will not have to work hard.
(2) People will live in global villages and promote love and peace.
(3) It will result in the philosophy of Americanism and Nationalism.
(4) Resources wastage and pollution will be limited.

28. The "Consumer Society" and the "Beyond Consumer Society" represents two different views and philosophies. The view that represents a strong possibility for the future is:

(1) That of "Consumer Society" because technology is so far advanced that it can't be stopped by any means.
(2) That of "Beyond Consumer Society" because gradually people will realize the need to live in tune with nature.
(3) That of "Consumer Society" because people will be production and pollution wise.
(4) That of "Beyond Consumer Society" because people will find it impossible to consume anymore.

29. ZPG stands for:

(1) Zero Production Group.
(2) Zero Productivity Generation.
(3) Zero Population Growth.
(4) Zooming People Growth.

30. According to Chant, if Canada allows unrestricted population growth:

(1) We will experience drastic shortages of vital commodities within the next few decades.
(2) Pollution and industrialization will kill us by 2020.
(3) By 2020, there will be almost twice as many people over 65 as there are today.
(4) We will need revolutionary technology to maintain our Consumer Society.

31. "If a man loses his respect for one part of life, he will soon lose it for all life". Albert Schweitzer's statement could imply the need for loving:

(1) Animals as people.
(2) Mentally deficient as well as unborn.
(3) Your own life and making most of it.
(4) People of all different religions.

32. Examining the major theories and projections on the right to life, it can be argued that:

(1) Technology will find a solution to population explosion.
(2) Population projections are questionable.
(3) Neuclear war will kill us before we reach the figure of the population projection.
(4) Pollution and production will be in harmony with the population projection figure.

33. Industrial Revolution was dominated by machines whereas the 20th century is dominated by:

(1) Human mind.
(2) Electronics.
(3) Audio-visual.
(4) Industrialization.

34. Computerized library is:

(1) A dream that will come true in next century.
(2) Already in existence.
(3) Used by universities only.
(4) Too expensive and revolutionary.

35. Society should not have a say in the number of children people should have because:

(1) Society can never know what is good for its citizens.
(2) It is difficult to define what is society.
(3) We will not have the population explosion problem in Canada for at least two centuries.
(4) Individuals should have the freedom of choice.

36. According to the text, the most common form of birth control today is:

(1) Abortion.
(2) The "pill".
(3) Sex Education.
(4) Mass sterilization as done in India and China.

37. The population growth has been declining in North America since:

(1) 1950.
(2) 1959.
(3) 1963.
(4) 1968.

38. Judging from present world politics and economy, most countries may begin to voluntarily cut back on developing their industries and technology because:

(1) They will run out of resources, and "brain power".
(2) With population decline, future industrialization will not be a priority.
(3) They will become more farsighted in their development.
(4) With economic restrains, the capitalist societies will have to abandon its industrial growth.

39. Generalizing from the brief history of the computer developments, one could argue that:

(1) Man has progressed at the same rate since the Industrial Revolution.
(2) Man will undoubtedly destroy himself.
(3) Computer technology has reduced many of the society's tedious work.
(4) Computer technology has already reached its peak in sophistication.

40. The gasoline engine is to the human muscle what the electronic computer is to:

(1) Human system.
(2) Human blood.
(3) Human heart.
(4) Human brain.

APPENDIX I


CENTRE FOR NFLD. STUDIES
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