A DESCRIPTIVE AND COMPARATIVE STUDY OF THE INSTRUCTIONAL OBJECTIVES OF TEACHERS OF CHEMISTRY, ENGLISH, FRENCH, GEOGRAPHY, HISTORY AND MATHEMATICS AT GRADE TWELVE LEVEL IN ENGLISH-SPEAKING HIGH SCHOOLS OF THE OTTAWA BOARD OF EDUCATION

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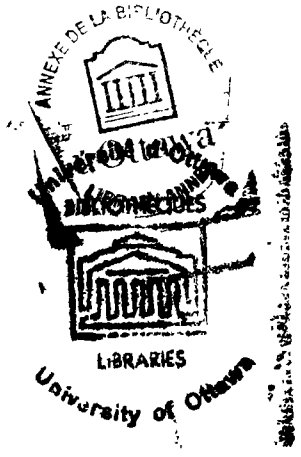
Thesis presented to the School of Graduate Studies of the University of Ottawa as partial fulfillment of the requirements for the degree of Doctor of Philosophy



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CURRICULUM STUDIORUM

Desmond J. Connelly was born in Melbourne, Australia, on August 1, 1928. He received the Bachelor of Arts degree from the University of London, England, in 1955, graduated Bachelor of Education from the University of Melbourne, Australia, in 1963, and was awarded the Diploma in Educational Administration in the University of New England, Australia, on April 11, 1970.

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INTRODUCTION

Motivated by a number of factors, particularly by the current demand that the school be in some sense accountable for the learning which takes place in it, thoughtful people have been led to direct their attention toward the classroom and to the adequacy of the objectives that are being pursued there. Very little research, however, has focused on the precise goals that teachers perceive themselves as following. This relative neglect constitutes a grave deficiency, not only because the teacher is a crucial factor in learning, but especially because many apparently sound instructional reforms have failed to penetrate into the educational level where immediate functional control is in the hands of the teacher, that is, into the classroom.

The research reported in the following pages arises from the desire to remedy in part the deficiency of which mention has just been made, and it is conceived as a first step in clearly delineating the major aspects of the classroom learning situation. Hopefully the report indicates directions and provides guidelines for further related research which can lead to improved instruction in high schools.

The problem which is central to the research is as follows: Do the instructional objectives pursued by teachers reflect a desirable level of comprehensiveness and quality?

The purpose of the study is to provide an answer to this question by, first, identifying teachers' objectives, then categorizing them in accordance with an acceptable taxonomy of cognitive and affective learning behavior, and then evaluating the objectives against criteria established by leading educationists.

For the sake of precision in the study, the general area of educational goals has been differentiated as follows:

(a) Goals.- intended outcomes of educational activity at any level of specificity.

(b) Aims.- broad, general goals that society envisages for schools.

(c) Purposes.- societal aims refined into more precise goals that serve to guide the over-all operation of the school.

(d) Objectives.- educational goals so precisely expressed as to make them directly relevant to the classroom.

(e) Behavioral objectives.- objectives specifying general learning outcomes associated with precise behaviors which are to be used as evidence that the desired learning has taken place.

(f) Operationalized objectives.- behavioral objectives with which teachers have associated evaluation of related student behaviors.

The study attempts to distinguish the instructional objectives which teachers judged appropriate to courses in six major subjects at grade twelve level in high schools. The relevant infomation was obtained by inviting the anonymous reactions of teachers to a carefully drawn up list of behavioral objectives for each subject, and also by encouraging free-response data from the teachers. The same method was used in identifying the objectives which the teachers included in their programs of instruction for the year in which the study was carried out. In the same way information was gained about the objectives with which teachers associated procedures for evaluation of related student behavior.

The first purpose of the study is to make a distinction between learning behaviors that teachers were making a realistic attempt to foster, and the behaviors to which they did no more than accord mere verbal approval. Teachers' objectives in each subject are compared with a classification of instructional goals authoritatively judged both comprehensive and adequate, and the major emphases of the objectives are evaluated in the light of modern educational thought about the purposes which those subjects should serve. Moreover, the educational outcomes being pursued in the six subjects taken as a whole are examined to see if they conformed to accepted criteria of scope and quality. Finally, the study seeks to clarify the implications for Ottawa high schools of fresh orientations presently being urged on schools.

Basic to the research are the following three propositions which are critically evaluated to see if they reliably portray the instructional situations with which this study is concerned:

1. The instructional objectives judged appropriate by a clear majority of grade twelve teachers of each of the six principal teaching subjects correspond closely to the objectives included in their teaching programs, and to those regarding which they evaluate related student performance.

2. The instructional objectives being aimed at by a clear majority of the grade twelve teachers of each of the six principal teaching subjects are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

3. The instructional objectives being aimed at by a clear majority of the grade twelve teachers of all of the six principal teaching subjects taken as a whole are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

Beginning with a review of the relevant literature in chapter one, the report of the research continues in the second chapter with a description of the design of the study, presents an analysis of the data in chapter three, and in the fourth chapter discusses the data in detail. The report concludes with a summary, some pertinent conclusions and

recommendations, an annotated bibliography, appendices, and an abstract of the study.

CHAPTER I

REVIEW OF THE LITERATURE

Beginning with evidence of the importance attached by society and by curriculum theorists to the question of educational goals, this chapter presents views about the elements that comprise a well-formulated objective and about the precision desirable in stating instructional objectives. Later sections of the chapter deal with procedures for determining what teachers' objectives are, the classification of such objectives, and the appropriateness of conducting research into teachers' objectives at the present time.

1. The Importance Society Attaches to Educational Aims.

The extent of the commitment to formal education has been made very clear through the relatively high proportion of its resources dedicated by society to this work. Such a heavy commitment reflects the importance of the purposes that society associates with educational institutions. Although the family remains the primary agency of initial socialization, it is acknowledged that in advanced societies formal indoctrination to both the ideological and technical requirements for operational effectiveness in society is increasingly served by education.[1] Moreover, it is also claimed that an increasingly

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1 Peter I. Rose, The Study of Society, New York, Random House, 1967, p. 526.

important function of the school is as an agency of manpower allocation, the school operating to distribute human resources within the role structure of adult society.[2]

Individuals and groups have concerned themselves with explicitly detailing in a number of notable statements[3,4,5] the implications of the school's functions in the United States, while in the Province of Ontario there have been three important expressions of educational aims[6,7,8] over recent decades.

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2 Talcott Parsons, "The School Class as a Social System: Some of its Functions in American Society," Harvard Educational Review, Vol. 29, No. 4, Fall 1959, p. 298.

3 Examples of the statements referred to are:
The Educational Policies Commission of the National Education Association of the United States and the American Association of School Administrators, The Central Purpose of American Education, Washington, D.C., National Education Association, 1961, 1-21 p.;

4 J.W. Gardner, "National Goals in Education," in The President's Commission on National Goals for Americans, New York, Prentice Hall, 1960, p. 81-100;

5 Harvard University Committee on the Objectives of General Education in a Free Society, General Education in a Free Society, Cambridge, Harvard University Press, 1945.

6 Ontario Department of Education, Programme of Studies for Grades 1 to 6 of the Public and Separate Schools 1937, Ontario Department of Education, [1937], 3-122 p.;

7 Report of the Royal Commission on Education in Ontario 1950, Toronto, Baptist Johnston, 1950; and

8 Living and Learning, Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario, Toronto, Ontario Department of Education, 1968.

Despite the number of pronouncements the question of educational aims remains very much alive. Claiming that present education is not as good as it might be, Kaufman[9] urged a normative approach to philosophical discussion of the purposes of education. As recently as the 1970 Quance lectures in Canada, Janzen[10] urged more attention to educational aims as a help in curriculum development:

> Experimentation with broader, more socially significant educational purposes should be encouraged. Curriculum committees might formulate a group of socially conceived behavioral aims and objectives for each level of education, and then develop a supporting programme designed to achieve these aims.[11]

It is reasonable to assume that a purposive enterprise such as education should have definite aims. To be expected also is society's insistence on judging how well the school achieves the purposes that make it a distinctive social institution.[12] The National Assessment program in the United States affords evidence that societal interest in specifying

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9 W. Kaufman, "Educational Development from the Point of View of a Normative Philosophy," Harvard Educational Review, Vol. 36, No. 3, 1966, p. 247-264.

10 Henry Janzen, Curriculum Change in a Canadian Context, Toronto, Gage, 1970, 7-128 p.

11 Ibid., p. 110.

12 Harry S. Broudy, B. Othanel Smith and Joe R. Burnett, Democracy and Excellence in American Secondary Education, Chicago, Rand McNally, 1964, p. 43.

aims is complemented by a concern for outcomes. Supervised by the Educational Commission for the States, the National Assessment of Educational Progress (NAEP) is occupied in gathering evidence as to whether or not education is doing what people expect of it.[13] In the context of the present study, Ebel's comment on the National Assessment program is particularly apposite:

> Despite its influential sponsorship and generous financial support, the current project for national assessment would not have been allowed even a trial run if the time was not ripe for it.
>
> What has made the time ripe? Interest in education has never been higher in this country. Neither has the cost of providing it. Both of these generate a concern for quality.[14]

Ebel's remarks sum up well the chief point made in this section, namely, that society judges the question of educational aims to be important. The views of curriculum theorists on the same matter will be taken up in the next section.

2. Educational Goals in Curriculum Theory.

Societal interest in the aims of education was discussed in the previous section. Since aims have functional

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13 Frank B. Womer, "The National Assessment of Educational Progress: Concept and Organization," CAPS Capsule, Winter 1970, p. 2.

14 Robert L. Ebel, "Assessing National Assessment," CAPS Capsule, Winter 1970, p. 10.

implications, a reference to aims leads logically to a consideration of the operational level where plans for education are designed and put into effect. Curriculum and the theory that underlies it form a part of this level.

Claiming to put curriculum theory in perspective, Beauchamp offered a schema which showed that curriculum theory is an educational problem and "a necessary link in a series of events which in combination explain education."[15] It is concerned with giving meaning to patterns of purposeful learning activities by pointing up the relationships among curricular elements, and by directing the development, use and evaluation of the curriculum. Although the field of curriculum theory remains in a formative condition,[16] Macdonald[17] has suggested a useful and comprehensive categorization of current curriculum thinking by means of a threefold division. He classified curriculum theorizing as oriented toward statements about knowledge, statements about the curriculum realities, and statements about valued activity. The emphasis on objectives evidenced in the writings of

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15 George A. Beauchamp, Curriculum Theory (2nd ed.), Wilmett, Ill., Kagg Press, 1968, p. 4-5.

16 James K. Duncan and Jack R. Frymier, "Explorations in the Systematic Study of Curriculum," Theory in Practice, Vol. 6, No. 4, October 1967, p. 180.

17 James B. Macdonald, "Curriculum Theory," The Journal of Educational Research, Vol. 64, No. 5, January 1971, p. 197.

educational thinkers considered earlier in these pages is found to be reiterated in the proponents of the different orientations identified by Macdonald. Each of these orientations will be discussed in the following sections beginning with examples of theorizing oriented toward statements about knowledge.

(a) The Knowledge School.- This was represented by Bruner,[18] Schwab,[19] King and Brownell,[20] and Phenix.[21] It was Bruner's[22] report on the Woods Hole Conference that initiated the various attempts to have the subject matter taught in schools conform to the structure of the disciplines and the modes of disciplined inquiry. He argued that "the structure of knowledge--its connectedness and the derivations that make one idea follow another--is the proper emphasis of education."[23]

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18 Jerome S. Bruner, The Process of Education, Cambridge, Harvard University Press, 1960, vii-97 p.

19 Joseph J. Schwab, "Structures of the Disciplines: Meanings and Significances," in G.W. Ford and Lawrence Pugno (eds.), The Structure of Knowledge and the Curriculum, Chicago, Rand McNally, 1964, p. 1-30.

20 Arthur R. King and John A. Brownell, The Curriculum and the Disciplines of Knowledge: A Theory of Curriculum Practice, New York, John Wiley, 1966, v-221 p.

21 Philip H. Phenix, Realms of Meaning, New York, McGraw-Hill, 1964, ix-391 p.

22 Bruner, op. cit., vii-97 p.

23 Jerome S. Bruner, On Knowing: Essays for the Left Hand, Cambridge, Belknap Press of Harvard University Press, 1964, p. 120.

In consequence, one of his major principles was that "the process and the goal of education are one and the same thing. The goal of education is disciplined understanding; that is the process as well."[24] Bruner's insistence on clear aims was applied to every level of schooling. In his outline of a social studies course on man, he[25] emphasized that the degree of success in the planning and teaching of the course has to be assessed in the light of the specific aims that are proposed for it. In one of the most influential educational works of the sixties, Bruner laid special emphasis on classroom objectives:

> In planning a curriculum, one properly distinguishes between the long-run objective one hopes to achieve, and certain short-run steps that get one toward that objective. [...] While one benefits from clarity about the ends of education, it is often true that we may discover new ultimate objectives in the process of trying to reach more modest goals.[26]

In 1970, Bruner,[27] in calling for an advance on the Woods Hole thinking, laid even greater emphasis on the purposes and objectives of schooling.

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24 Ibid., p. 122.

25 Jerome S. Bruner, Toward a Theory of Instruction, Cambridge, Belknap Press of Harvard University Press, 1966, vii-176 p.

26 --------, The Process of Education, p. 69.

27 --------, "The Process of Education Re-visited," Phi Delta Kappan, Vol. 53, No. 1, September 1971, p. 18-21.

Schwab,[28] much more analytic and detailed in his understanding of structure than Bruner, shared the latter's concern for educational objectives. Although he expressed distrust of having educational outcomes as the sole leading principles for devising, controlling and evaluating curriculum, he yet accepted their importance, and warned against an education that would be a "series of abortive jerks and startings, with no course charted and followed to a defensible conclusion."[29]

Similar emphasis is inherent in the principles enunciated by King and Brownell.[30] They understood the liberal curriculum as a "planned series of encounters between a student and some selection of the communities of discourse."[31] Accepting that the intellectual perspective in man is the prime claim on the content of the curriculum, they held that the curriculum has its own objectives, and that these constitute the justification of the liberal curriculum as they envisaged it.

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28 Schwab, op. cit., p. 1-30.

29 --------, "The Practical: Arts of Eclectic," School Review, Vol. 79, No. 4, August 1971, p. 540.

30 King and Brownell, op. cit., v-221 p.

31 Ibid., p. 12.

In close harmony with the same principles, Phenix[32] presented a conceptual re-organization of the fields of knowledge with the intention of facilitating learning and use of knowledge. He[33] affirmed that decisions about the nature and the content of courses were all dependent on the ends to which education was directed.

(b) Reality-oriented School.- The second category of curriculum theorizing in Macdonald's classification embraced statements about the curriculum realities. He described these statements as focusing on the elements which constitute the complex pattern of living, and pointed up one of their central concerns as "identifying the fundamental unit of curriculum with which to build conceptual systems."[34] The conceptual models cited are those of Goodlad and Richter,[35] Johnson,[36] and Macdonald's[37] own.

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32 Phenix, op. cit., ix-391 p.

33 Ibid., p. 267.

34 Macdonald, op. cit., p. 198-199.

35 John I. Goodlad and Maurice N. Richter, Jr., The Development of a Conceptual System for Dealing with the Problems of Curriculum and Instruction, Los Angeles, University of California and Institute for Development of Educational Activities, [1966], i-69 p.

36 Mauritz Johnson, Jr., "Definitions and Models in Curriculum Theory," Educational Theory, Vol. 17, No. 2, April 1967, p. 127-140.

37 James B. Macdonald, "An Example of Disciplined Curriculum Thinking," Theory into Practice, Vol. 6, No. 4, October 1967, p. 166-171.

The conceptual system of Goodlad and Richter is described and explained in a 1966 report of an inquiry that extended over a number of years. Goodlad[38] spoke of it as an attempt to develop, refine and supplement ideas originally propounded by Ralph Tyler. Values are used as a starting-point, and curriculum is defined as the end product of a number of decisions, one set of these involving the determination of objectives. The authors argued that if curriculum planning is to be rational there has to be "both clarification and acceptance of ends by those conducting or responsible for the educational enterprise."[39]

Johnson viewed curriculum as "a structured series of intended learning outcomes,"[40] and affirmed that "in specifying outcomes to be sought, curriculum is concerned with ends, [...] at the level of attainable learning products."[41] He[42] pointed out, moreover, that his emphasis on objectives as a matter of curricular concern was common to the proponents of two major conceptions of the curriculum. Johnson[43] claimed

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38 Goodlad and Richter, op. cit., p. i.

39 Ibid., p. 15.

40 Johnson, op. cit., p. 130.

41 Ibid.

42 Mauritz Johnson, Jr., "On the Meaning of Curriculum Design," Curriculum Theory Network, No. 3, Spring 1969, p. 5.

43 Ibid.

that he, along with thinkers like Goodlad and Gagné, saw the selection and ordering of objectives in terms of learnables as the essence of the curriculum task, whereas others construed curriculum in terms of experience, and viewed the stating of objectives as only one of a number of important steps. In support of his own curriculum model Johnson[44] argued that it helped clarify the curriculum research domain by making a number of questions susceptible to competent investigation. The first question he listed dealt with the rules relating intended outcomes and more general educational and training objectives.

Macdonald[45] perceived the curriculum as the immediate output of the guided interactions of administrative, instructional, curriculum development and personality subsystems. Along with other major propositions this understanding of the nature of curriculum was to guide the dynamics of theorizing. It is apposite to remark that the subsystems identified by Macdonald are concerned primarily with the achievement of goals.

(c) Value-oriented School.- Distinct from the conceptual models of the reality-oriented school was a group of

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44 Johnson, "Definitions and Models in Curriculum Theory," p. 135.

45 Macdonald, "An Example of Disciplined Curriculum Thinking," p. 170.

curriculum designs, the purpose of which, according to Macdonald,[46] was clearly to prescribe, legitimize and win advocates, rather than simply describe, explain and/or control. The curriculum based on social processes and life functions, and the core curriculum are taken as representative of this third category which, according to Johnson,[47] comprised as many as six current designs with objectives as a variable common to all of them.

Stratemeyer et al.,[48] in developing a design based on activities of man, stressed that the inclusion of specific goals was important in stating the life situations to be used in the curriculum. Moreover, dealing with evaluation as an integral part of every learning situation, the authors[49] emphasized that the first and basic step was clarification of the goals to be reached.

Alberty's[50] description of six variants of the core curriculum demonstrated the importance attributed in each to

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46 Macdonald, "Curriculum Theory," p. 199.

47 Johnson, "On the Meaning of Curriculum Design," p. 4.

48 Florence B. Stratemeyer, H.L. Forkner, M.G. McKim and A.H. Passow, Developing a Curriculum for Modern Living, New York, Teachers College, Columbia University, 1957 (2nd ed.), 3-740 p.

49 Ibid., p. 166.

50 Harold Alberty, "Designing Programs to Meet the Common Needs of Youth," in Nelson B. Henry (ed.), Adapting the School Program to the Needs of Youth, Fifty-second Yearbook of the National Society for the Study of Education, Part I, Chicago, Ill., The Society, 1953, p. 118-140.

the matter of objectives. Analyzing the approach that he judged superior to the others, Alberty showed the important part played by pre-determined goals as a basis for planned problem solving as well as in the evaluation of effectiveness.

Up to this stage the present section has demonstrated that educational objectives are important in all the major types of curriculum theory. The point could be reinforced by reference to educators who exerted powerful influence in bringing curriculum to its present stage of development. Identifying a number of such figures in a recent review of the educational developments of the fifties and sixties, McClure[51] referred to a largely fruitful and productive collaboration among articulate and thoughtful educators at all levels of the educational spectrum. Representative of those he named are Beauchamp,[52] Herrick,[53] Louise Tyler,[54] Taba,[55] and

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51 Robert M. McClure, "The Reforms of the Fifties and Sixties: A Historical Look at the Near Past," in R. McClure (ed.), The Curriculum: Retrospect and Prospect, Seventieth Yearbook of the National Society for the Study of Education, Part I, Chicago, Ill., The Society, 1971, p. 49.

52 Beauchamp, op. cit., vii-186 p.

53 Virgil E. Herrick, "Establishing and Using Objectives," in D.W. Anderson et al. (eds.), Strategies of Curriculum Development, Columbus, Ohio, Charles E. Merrill, 1965, p. 89-106.

54 M. Frances Klein and Louise Tyler, "On Analyzing Curricula," Curriculum Theory Network, No. 3, Spring 1969, p. 10-25.

55 Hilda Taba, Curriculum Development: Theory and Practice, New York, Harcourt, Brace and World, 1962, v-526 p.

[in McClure's words] the dean of the curriculum theorists, Ralph Tyler.[56]

Belief in the importance of educational objectives characterized all these educationists. Beauchamp,[57] for example, believed that they govern curriculum and instruction and are closely involved in the process of evaluation. Herrick[58] claimed that they serve as one of the important definers of scope, provide the initial base for selecting possible learning activities, and form one of the many referents for evaluation. Louise Tyler, in collaboration with Klein,[59] offered a series of recommendations which in their opinion reflected a consensus among the leading scholars in curriculum theory. The first of these recommendations urged as essential the substantiation of the worth of the curriculum objectives chosen, a determination of the direct relationship between the objectives and learning opportunities, and the specification of the objectives in precise operational terms.[60]

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56 Ralph W. Tyler, Basic Principles of Curriculum and Instruction, Chicago, University of Chicago Press, 1949, v-128 p.

57 Beauchamp, op. cit., p. 81.

58 Herrick, op. cit., p. 89-90.

59 Klein and Louise Tyler, op. cit., p. 10-25.

60 Ibid., p. 19-20.

Taba held a similar position in arguing that the clarification of the functions of objectives at the teaching level is "essential to arriving at a serviceable guide to curriculum development."[61] She affirmed, moreover, that among the most important of the functions served by educational objectives were those of guiding decisions about the selection of content and of learning experiences, and of providing criteria for what should be taught and how this should be done. Turning finally to Ralph Tyler,[62] it can be stated that the basic element in his curriculum rationale is educational objectives. In Tyler's opinion all aspects of the educational program are really means to accomplish basic educational goals, these goals constituting the criteria by which materials are selected, content is outlined, instructional procedures are developed, and tests and examinations prepared.[63] In a recent updating and clarification of his 1949 text, Tyler[64] urged even more detailed consideration of the question of educational objectives.

Arising clearly from the foregoing paragraphs is the diversity of functions attributed by curriculum thinkers to

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61 Taba, op. cit., p. 197.

62 Ralph W. Tyler, op. cit., v-128 p.

63 Ibid., p. 3.

64 Ralph W. Tyler, "New Dimensions in Curriculum Development," Phi Delta Kappan, Vol. 48, No. 1, September 1966, p. 26.

educational objectives: direction of ongoing classroom instruction, guidance in the selection of content, assistance in the evaluation of student progress and of courses, guidance in the development of new courses. A conclusion appropriate to the present study, and evident in the considerations detailed in this second section of the chapter, is that major curriculum theorists and practitioners accord considerable importance to the matter of educational objectives. The next section takes up the question of how these should be expressed so that their intent is clearly communicated.

3. Meaningful Communication of Educational Goals.

Although there is no lack of statements of basic educational purposes, their impact on the classroom situation appears to have been minimal. Orlich and Shermis[65] claimed that such statements are often little more than poorly worded and platitudinous plagiarisms. Dyer asserted that they are "essentially non-functional [... having] little or no effect where the [...] decisions about education are made,"[66] while

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65 Donald C. Orlich and S. Samuel Shermis, "Educational Philosophy as Mythology: A Critical Analysis of School Philosophies," Administrator's Notebook, Vol. 14, No. 4, December 1965, p. 1-3.

66 Henry S. Dyer, The Discovery and Development of Educational Goals, Princeton, N.J., Educational Testing Service, 1966, p. 4.

in the same context Bereiter[67] pointed to the discrepancy between principle and practice as being universal. The reason for the lack of practical impact seems to lie in the expression of educational goals in terms that have little precise meaning or specific functional implication. The difficulty of analyzing many stated goals into elements meaningful at the operational level creates a serious obstacle to useful inquiry into what is being attempted with regard to the learning of pupils in school. The present study takes the view that one solution lies not in examining broad statements of educational goals, but rather in identifying the particular objectives that classroom teachers perceive as meaningful and functional.

Attention is directed in the first instance to the classroom teacher because his role is judged crucial. Paton[68] underlined the validity of this judgment in stating that the whole tenor of the report of a recent provincial committee on educational aims pointed to the firm conclusion that the

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67 Carl Bereiter, "A Proposal to Abolish Education," in B. Crittenden (ed.), Means and Ends in Education: Comments on Living and Learning, Toronto, Ontario Institute for Studies in Education, 1969, p. 60.

68 James M. Paton, "Innovations in Ontario Schools--Summary and Interpretation of the Conference," in Rethinking Education, Proceedings of a Conference on the Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario, April 17-19, 1969, Toronto, Ontario Institute for Studies in Education, 1969, p. 60.

individual teacher is the most important single factor in the improvement of school learning.[69]

In order to identify goals that are appropriate to the teaching situation, use was made of the conceptual system designed by Goodlad and Richter[70] to differentiate curriculum into definable and researchable subject-matter. Specifying levels of decision-making the system identifies that of society in general as the one most remote from the learner, the instructional level is identified as the one closest to the learner, while the institutional level occupies a position intermediate between the other two. Derived from values, the societal and institutional goals are refined at the instructional or classroom level to clear and specific statements having behavioral and substantive components.[71] Myers[72] provided a valuable clarification and development of the Goodlad-Richter system. With regard to objectives, he wrote:

> The societal aims of the Board of Education are translated into institutional purposes. The institutional purposes in turn are translated into instructional objectives. The difference between institutional purposes and instructional objectives is one of specificity.[73]

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69 Living and Learning, 4-221 p.

70 Goodlad and Richter, op. cit., i-69 p.

71 Ibid., p. 50.

72 Donald A. Myers, Decision Making in Curriculum and Instruction, Dayton, Ohio, Institute for Development of Educational Activities, 1970, vii-54 p.

73 Ibid., p. 28.

Myers[74] further insisted that while operating within the general framework laid down by the appropriate educational authority, the classroom teacher should make all the decisions at the instructional level.

From the Goodlad-Myers-Richter system illustrated in Figure 1 firm guiding principles for the present study were derived. These principles are summarized in the statement that meaningful information about what is being attempted in schools is most likely to be found in specific instructional objectives containing behavioral and substantive elements. While avoiding a degree of precision that would relate them to particular classroom situations, the statements of objectives to be used in the present research needed to be sufficiently specific for their functional implications to be communicated without ambiguity to a cross-section of high school teachers. Guidance about the most suitable manner of doing this was sought in the relevant literature, and this matter is developed in subsequent paragraphs.

Although a wealth of published material[75,76] seems to attest considerable interest in objectives composed of

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74 Ibid., p. 27.

75 Bibliographies of such material are available, for example: Raymond Bernabei, Behavioral Objectives: An Annotated Resource File, Harrisburgh, Penn., Department of Public Instruction, [no date], 1-45 p.

76 Also, Canadian Teachers' Federation, Behavioral Objectives in Education, Ottawa, The Federation, March 1971, 3-35 p.

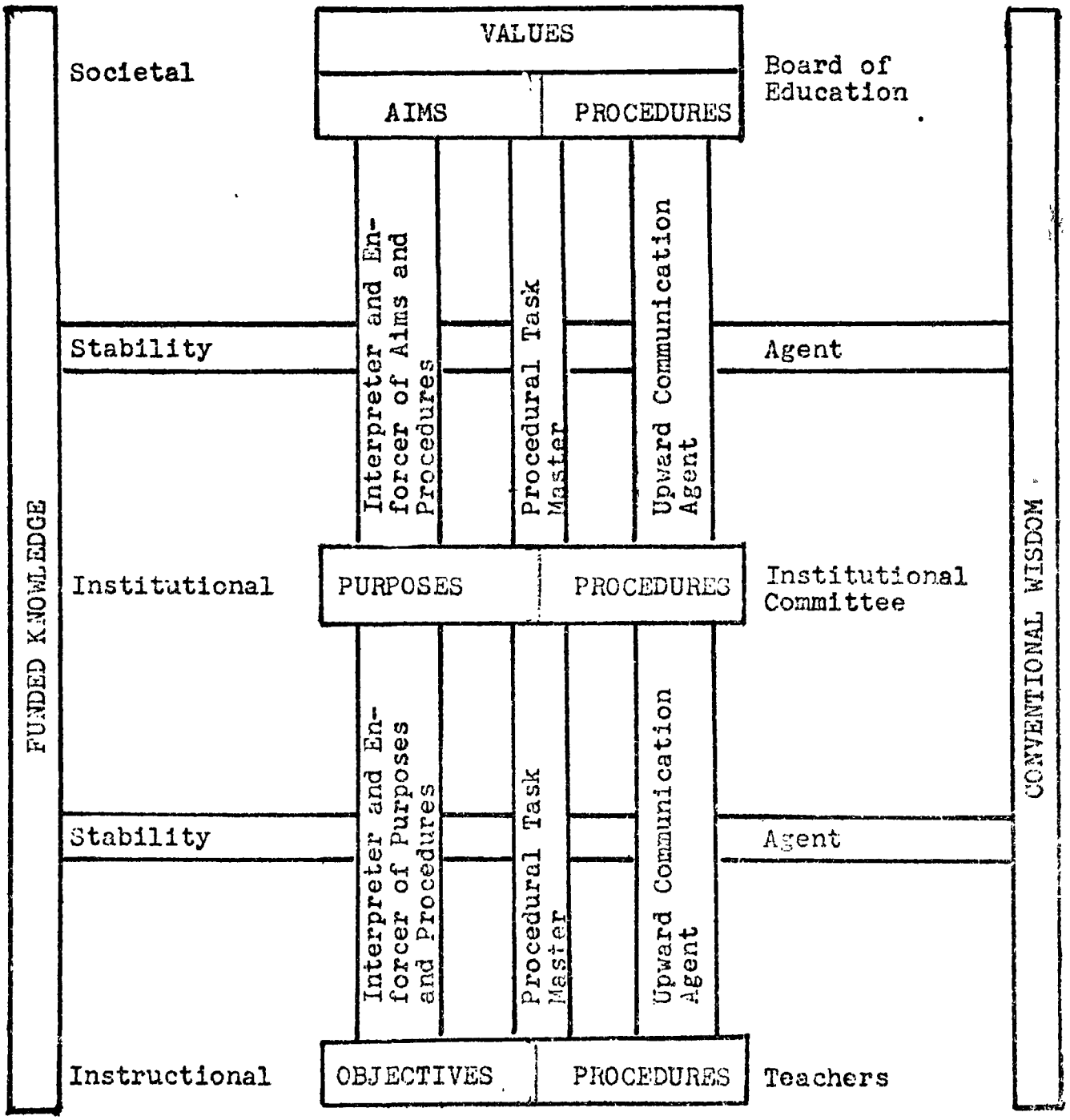

Figure 1.- Decision-making Levels for Curriculum and Instruction. Adapted by Myers from Goodlad and Richter.

behavioral and substantive elements (that is, behavioral objectives), an analysis of the literature reveals uncertainty and controversy over the degree of specificity desirable in their expression.

Belief in explicit objectives couched in clear and specific terms was associated, as Callahan[77] showed, with the scientific movement in the early years of the twentieth century. Bobbitt[78] complained that the controlling purposes of education had not been sufficiently particularized and, criticizing the vague, ill-defined, indefinite and even nebulous character of much educational activity, he concluded that as long as objectives are little more than vague guesses, sureness over means and procedures will be lacking. For him the solution lay in coming to grips with the formidable task of defining the very large number of specific objectives that are related to the school's purposes.[79]

The progressive movement of the thirties and early forties was averse to the extreme specificity promoted by Bobbitt and others. Nevertheless, as evidenced by a number of

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77 Raymond E. Callahan, Education and the Cult of Efficiency: A Study of the Social Forces that Have Shaped the Administration of the Public Schools, Chicago, University of Chicago Press, 1962, p. 83.

78 Franklin Bobbitt, The Curriculum, Boston, Houghton Mifflin, 1918, p. 41.

79 Ibid., p. 282.

the papers presented in a 1947 conference on curriculum theory,[80] the principle of specific behavioral objectives was constantly espoused by a number of educationists, even throughout the heyday of the progressive movement. The principle of behavioral objectives was a consistent thread in the works of Ralph Tyler, one of the most influential of curriculum writers over recent decades. In 1949 Tyler[81] claimed that the purpose of a statement of objectives is to indicate the kinds of changes in the student to be brought about so that instructional activities can be planned and developed in a way likely to attain the objectives. He criticized objectives that are stated in the form of generalized patterns of behavior which fail to indicate more specifically the area of life or the content to which the behavior applies, because he considered it very unlikely that efforts to aim at such highly generalized objectives would be successful. He specified the most useful form for stating objectives as one which identifies both the kind of behavior to be developed in the student and the content or area of life in which this behavior is to operate. These

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80 Virgil E. Herrick and Ralph W. Tyler, Toward Improved Curriculum Theory, Chicago, University of Chicago Press, 1950, iii-124 p.

81 Ralph W. Tyler, Basic Principles of Curriculum and Instruction, Chicago, University of Chicago Press, 1949, p. 45-47.

prescriptions are highly consistent with statements about objectives which Tyler[82] made as early as 1934.

Although Tyler's views seemed to have had only slight influence in the fifties, a number of factors in the subsequent decade contributed to a strong movement toward highly specific statements of instructional objectives. It is said that among such factors were impatience with statements of educational goals that had little exact meaning for the classroom teacher, a more sophisticated approach to curriculum development and evaluation, the rise of the programmed instruction movement, an apparent preference of the United States Office of Education for programs involving the use of behavioral objectives, and the popularizing of aids to the writing of this kind of objective.[83]

Although writers like Popham[84] have offered a persuasive case for behavioral objectives expressed as precisely as circumstances permit, opinions about the appropriate degree of precision continue to cover a wide spectrum. Some, like

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82 Ralph W. Tyler, Constructing Achievement Tests, Columbus, Ohio, Ohio State University, 1934, p. 16-18 and 102.

83 W. James Popham, "Objectives and Instruction," in W.J. Popham, E.W. Eisner, H.J. Sullivan and L.L. Tyler, Instructional Objectives, Chicago, Rand McNally, 1969, p. 34.

84 Ibid., p. 32-64.

Macdonald and Wolfson,[85] expressed total opposition to a behavioral objective model for instruction, seeing it as inadequate and restrictive to the educational function of schools. Eisner[86] took the view that the significance for curriculum development of stating educational objectives has been overemphasized. Moreover, based as they are, in his opinion, on an undesirable conception of education related to the cult of efficiency of the twenties, statements of educational objectives have inherent limitations and fail to encompass creative procedures related to what he termed expressive objectives, that is, evocative, but not prescriptive descriptions of educational encounters.[87] Yet other writers, like Haberman,[88] while making a clear appraisal of both the benefits and the deficiencies of behaviorally stated objectives, urged a positive attitude toward them, since they promise to be the major

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85 James B. Macdonald and Bernice J. Wolfson, "A Case against Behavioral Objectives," The Elementary School Journal, Vol. 71, No. 3, December 1970, p. 119-128.

86 Elliott W. Eisner, "Educational Objectives: Help or Hindrance?," The School Review, Vol. 75, No. 3, Autumn 1967, p. 280 and 253.

87 --------, "Instructional and Expressive Objectives: Their Formulation and Use in Curriculum," in Popham et al., op. cit., p. 15-16.

88 Martin Haberman, "Behavioral Objectives: Bandwagon or Breakthrough?," The Journal of Teacher Education, Vol. 19, No. 1, Spring 1968, p. 91-94.

vehicle for revising curriculum in the future. Ojemann,[89] after making a critical examination of a number of objections to formulating objectives in behavioral terms, reached a conclusion highly pertinent to the present study:

> It is difficult to see how we can make progress in the educative process without meaningful communication. The purpose of behavioral objectives is to make objectives so meaningful that those involved in a given setting can work together. [...] It is quite possible that the use of behavioral referents is not the only way or the best way of achieving meaningfulness. It appears, however, that it is the best method now available.[90]

There is evidence that the question of formulating objectives in behavioral terms, far from being confined to discussion in educational writings, is engaging the attention of those directly involved in instruction. In 1965 the Cooperative Research Act funded the Center for the Study of Evaluation at the University of California at Los Angeles. The Center's strategy for evaluation of instructional programs accepted as a major premise that the most basic need in the evaluation of specific instructional programs is the proper identification of well-stated objectives and of test items to

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89 Ralph H. Ojemann, "Should Educational Objectives Be Stated in Behavioral Terms?," Parts I and II, The Elementary School Journal, Vol. 68, No. 5, February 1968, p. 223-231, and Vol. 69, No. 5, February 1969, p. 229-235.

90 Ibid., Part II, p. 234.

measure those objectives.[91] Consequently the Instructional Objectives Exchange was set up for the depositing, developing and disseminating of measurable objectives and items for use by educators. A number of groups of schools, such as the Model Schools Project[92] and the ES'70 program,[93] make use of objectives from the Exchange, or at least emphasize in their operation the specification of precise instructional objectives.

A similar interest is seen to be active in the Province of Ontario. Evidence in this regard comes from a number of quarters. During 1971 various groups ranging from individual school staffs and subject teachers to high school principals and vice-principals made frequent requests to instructors in Curriculum Theory and Practice at the University of Ottawa for assistance in the formulation of behaviorally stated objectives. In parts of the province teachers have passed the stage of mere specification of behavioral objectives and, progressing beyond the development of curriculum building processes, have

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91 Marvin C. Alkin, "Products for Improving Educational Evaluation," Fifth Annual Report to the U.S. Office of Education, in Evaluation Comment, Los Angeles, California, UCLA Center for the Study of Evaluation, Vol. 2, No. 3, September 1970, p. 9.

92 William Georgiades and J. Lloyd Trump, "NASSP Model Schools Project," Journal of Secondary Education, Vol. 46, No. 4, April 1971, p. 168-171.

93 David S. Bushnell, "ES ' 70: A Systems Approach to Educational Reform," Journal of Secondary Education, Vol. 46, No. 4, April 1971, p. 150-155.

proceeded with the subsequent evaluation of programs in terms of student achievement of objectives.[94, 95] The Ontario Association of Education Officials sponsored a series of five workshops aimed at identifying problem areas for its membership. The report which summarized the findings reached at the workshops in five major cities of the province listed in order of priority nineteen areas of concern for education officials, the fifth of these comprising the development of an adequate philosophy of education, the setting of priorities in long and short-term objectives, and the effect of goals on programs and curriculum planning.[96] A justifiable conclusion from the foregoing overview of some developments in parts of Ontario is that the local scene is beginning to reflect the rather strong American concern for explicit, precise and meaningful objectives.

This section has dealt with the formulation of educational goals in terms which make their functional intent clear. Dissatisfaction with vaguely expressed aims and

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94 Helen Skelly, "POISE and I," in Orbit, Preliminary Issue, No. 1, October 1969, p. 16-17.

95 Kenneth A. Leithwood, "Evaluating Achievement of Educational Objectives," Orbit, Vol. 2, No. 4, October 1971, p. 10-11.

96 D.F. Musella and H.D. Joyce, Identifying Needs for Professional Leadership, Report on the Workshops sponsored by Ontario Association of Education Officials, mimeo, November 1971, 1-19 p.

purposes has been shown to be one of a number of causes leading to a preference for making use of objectives relating directly to the classroom situation and having behavioral and substantive elements. While objectives of this kind, termed behavioral, have been criticized adversely in some quarters, the foregoing section has shown that they are believed to constitute the best available means of conveying instructional intent and of assisting curriculum development. The section that follows deals with the degree of specificity that is appropriate in the expression of an objective.

4. Degree of Specificity in Stating Objectives.

The objectives used in the present study needed to be expressed in terms that meaningfully communicated their functional implications to a cross-section of high school teachers. In accordance with the Goodlad-Richter-Myers model, referred to in the previous section, the objectives would have to be appropriate to the classroom or instructional level, but the degree of specificity in their expression constituted a separate question.

Gagné[97] required four elements in the statement of an objective: the stimulus situation which initiated performance,

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97 Robert M. Gagné, "The Analysis of Instructional Objectives for the Design of Instruction," in Teaching Machines and Programmed Learning: Vol. II - Data and Directions, Washington, D.C., National Education Association, 1965, p. 34.

an action verb denoting observable behavior, a term denoting the object acted upon, and finally an indication of the characteristics of the performance that determine its correctness. Mager[98] asked for a statement that identifies and names the over-all behavioral act, defines the important conditions under which the behavior is to occur, and also defines the criterion of acceptable performance. McAshan[99] distinguished two types of behavioral objectives, termed minimum level and desired level. The former comprise a basic statement of goal with reference to the learner, the program variable and the implied behavioral domain; in addition, the performance, activity, behavior or instrumentation involved in evaluation has to be stated. To all of this the desired level statement adds the criterion standard of the expected success level. Bernabei and Leles[100] specified four characteristics of a meaningful objective: a description of the learner, a description of behavior, a specification of the conditions for learning, and the performance level expected. The prescriptions of all of these writers were

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98 Robert F. Mager, Preparing Instructional Objectives, Palo Alto, California, Fearon Publishers, 1962, p. 53.

99 H.H. McAshan, Writing Behavioral Objectives--A New Approach, New York, Harper and Row, 1970, p. 17, 18, 23.

100 Raymond Bernabei and Sam Leles, Behavioral Objectives in Curriculum and Evaluation, Dubuque, Iowa, Kendall Hunt, 1970, p. 34-35.

judged to relate too closely to particular classroom settings to be useful in the present study. In particular, the inclusion of a level of acceptable performance was unsuitable in surveying a number of varying situations.

More relevant to the purposes of this research is the type of objective which Kibler, Barker and Miles[101] termed informational and which is used by instructional designers in communicating their intentions to others. On closer examination, however, objectives of this kind were found inappropriate as they reveal a close relationship with specific instructional situations and, moreover, lack a statement of general educational purpose, such as the growth of knowledge, understanding or awareness. Jenkins and Deno[102] produced a model much more pertinent to the requirements of the study. Specifying four levels in the formulation of educational goals, the model, shown in Figure 2, affirms that various capabilities are to be inferred from proficiency in carrying out specific tasks. These capabilities are evidence of dispositional states requisite for the eventual achievement of societal aims. The

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101 Robert J. Kibler, Larry L. Barker, and David T. Miles, Behavioral Objectives and Instruction, Boston, Allyn and Bacon, 1970, p. 20-30.

102 Joseph R. Jenkins and Stanley L. Deno, "A Model for Instructional Objectives--Responsibilities and Advantages," Educational Technology, Vol. 10, No. 12, December 1970, p. 11-16.

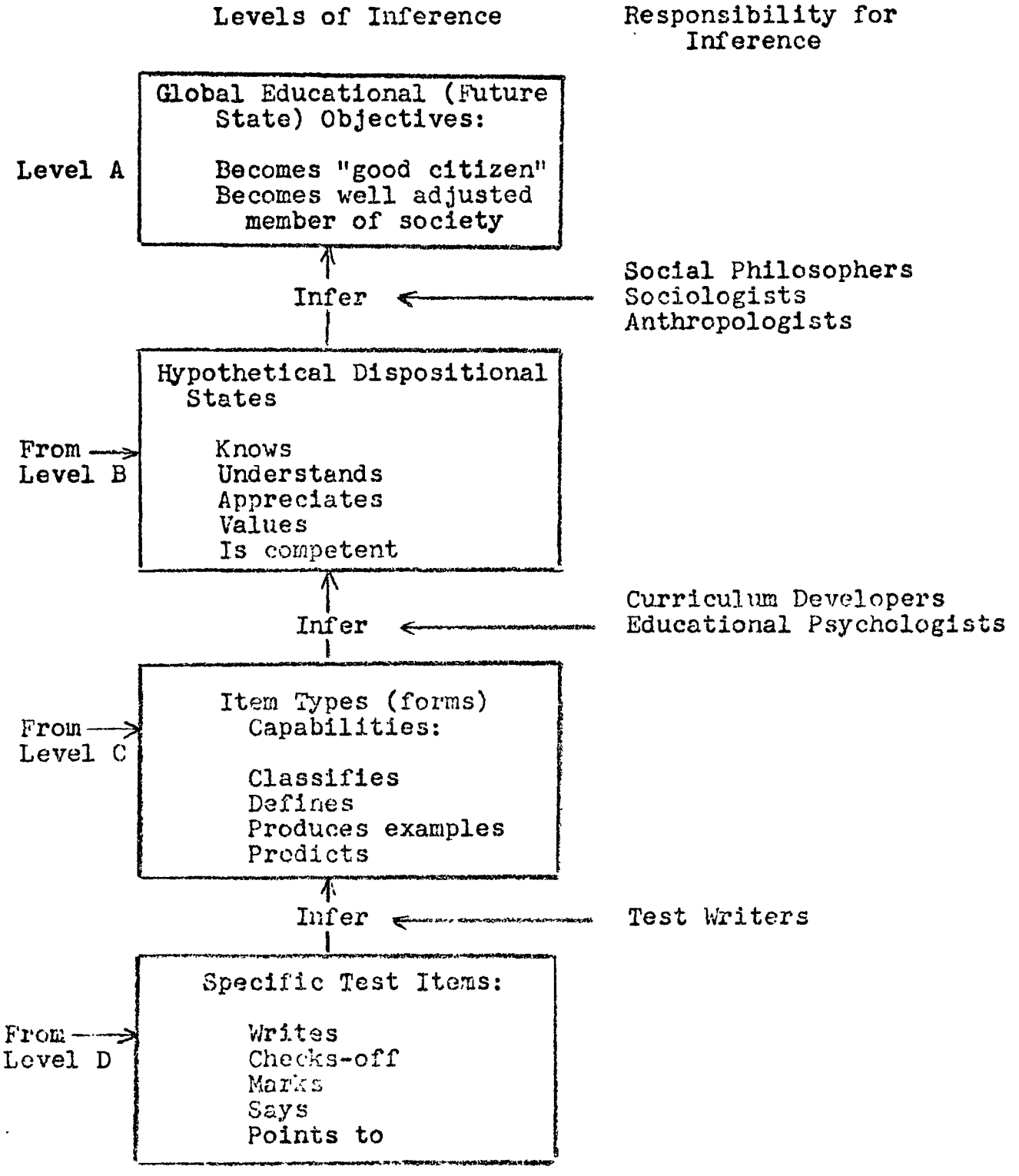

Figure 2.- Model for Instructional Objectives. Taken from Jenkins and Deno.

model indicates responsible agents at different levels and describes the nature of the inferences on which they act. Objectives representing a combination of levels B and C in the model are suitable for this research as they specify behavior, relate it to a definite instructional purpose, but avoid the specificity of level D where activities are determined by the individual teacher's personal preferences and by the exigencies of the situation in which he finds himself.

Strong support for this manner of expressing objectives is given by Gronlund[103] who argued that for levels of instruction higher than the mere training level objectives should state general learning outcomes along with a representative sample of the specific types of behavior that indicate attainment of the objective. He claimed that such a procedure makes it clear that teaching is directed toward the general objective of instruction, and not toward the samples of behavior selected to illustrate each objective. In explanation of these objectives, which he categorized as dealing with outcomes at the developmental level, Gronlund wrote:

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103 Norman E. Gronlund, Stating Behavioral Objectives for Classroom Instruction, Toronto, Ontario, Collier-Macmillan, 1970, p. 4-6.

> The instructional objectives here are typically more general than those at the mastery level. Rather than being stated as specific tasks to be performed, each objective represents a whole class of responses. Thus the objectives provide direction [...] without being overly restrictive with regard to the nature of the instruction or the types of learning activities to be engaged in by the student.[104]

Further support for expressing objectives in a manner that combines levels B and C of the Jenkins-Deno model is given by Bloom, Hastings and Madaus.[105] After stating that the task of determining objectives must rest largely with the teacher they assert that one of the most difficult problems in specifying objectives is that of making them sufficiently precise to convey clear ideas of what is intended to all of those who are concerned in the instruction of the children. They concluded that a solution is to be found by including with the definition of what should be learned a sample of the problems, questions, tasks, situations to which the student would be expected to give an appropriate response. These authors warned against an over-emphasis on content as also on pupil behavior divorced from content, insisting that precise and unambiguous communication of objectives involves accurate statements

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104 Ibid., p. 34.

105 Benjamin S. Bloom, J. Thomas Hastings, and George F. Madaus, Handbook on Formative and Summative Evaluation of Student Learning, New York, McGraw-Hill, 1971, p. 9, 15 and 23.

of expected behavioral changes in relation to a particular content area.[106]

The decision to use in this study objectives that combine Jenkins and Deno's levels B and C was still further strengthened by reference to Tyler[107] who, in warning against confusing clarity with a high degree of specificity, recommended that an objective include a clear statement of the kind of behavior to be developed along with specification of the nature of the related content. Tyler[108] saw such objectives as a necessary preliminary to the proper appraisal of student learning, such appraisal being itself one of the major steps in the improvement of education. Others, like Evans,[109] have described such statements as operationally defined objectives that encourage procedures which provide feedback as to the learning which is being achieved.

This section has presented various views about the degree of specificity that is appropriate in the statement of

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106 Ibid., p. 23.

107 Ralph W. Tyler, "Some Persistent Questions on the Defining of Objectives," in C.M. Lindvall (ed.), Defining Educational Objectives, Pittsburgh, University of Pittsburgh Press, 1964, p. 78-79.

108 Ibid., p. 83.

109 G.T. Evans, "Attitudes, Ends and Means," in Crittenden (ed.) op. cit., p. 49-50.

an educational objective and has given reasons for the decision to use in this research objectives representing levels B and C of the Jenkins-Deno model. The next section deals with the manner of determining what teachers' objectives are.

5. Procedures for Determining Teachers' Objectives.

At this stage it has been established that if an inquiry into educational goals is to be meaningful it should be based on instructional objectives expressed in the form recommended by the writers considered in the latter part of the previous section. It now remains to determine how to proceed in finding out what teachers' actual objectives are.

Two considerations prompted the rejection of making use of protracted observation of the classroom situation. First, observation of even a representative sample over a sufficiently long period was beyond the resources of the researcher, and second, there is a body of opinion requiring that effective observation of teaching be preceded by the teacher's explication of what his objectives are.[110] This being so, it was considered that the purposes of the present study could be adequately served by seeking information directly from the teachers.

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110 John D. McNeil, Toward Accountable Teachers, New York, Holt, Rinehart and Winston, 1971, p. 36 and 52.

It was judged inadvisable to request that teachers proffer a precisely worded list of the objectives they were pursuing. The judgment was based on claims by Gronlund[111] and Lindvall[112] that the adequate definition of instructional outcomes often proved a difficult and frustrating task. In the Canadian setting Elliott[113] spoke of the great difficulty that most teachers experienced in stating objectives, thus reflecting the experience of Carter[114] who found that considerable time and professional assistance were required by teachers in the formulation of their objectives. Even Popham,[115] one of the most enthusiastic protagonists of behavioral objectives, recognized that the production of precise objectives is an onerous task requiring special skill and probably beyond the capability of most teachers unless special help and training are provided. An acceptable alternative seemed to the present

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111 Gronlund, op. cit., p. 11.

112 C.M. Lindvall, "The Importance of Specific Objectives in Curriculum Development," in Lindvall (ed.), op. cit., p. 17.

113 Arthur Elliott, "Accountability in Public Education," Orbit, Vol. 2, No. 4, October 1971, p. 6.

114 Vernon Carter, "PPBS in a Small High School--It Can Be Done," Journal of Secondary Education, Vol. 45, No. 7, November 1970, p. 315.

115 W. James Popham, "Practical Ways of Improving Curriculum via Measurable Objectives," The Bulletin of the National Association of Secondary School Principals, Vol. 55, No. 355, May 1971, p. 79.

researcher to lie in giving teachers carefully prepared lists of precisely worded objectives relating directly to the subject-matter taught by the teachers, asking them to identify those objectives which corresponded to their own objectives, and giving them the opportunity to use the prepared list as a model for the formulation and addition of any objectives important in their teaching but not included among those presented to them. It was this procedure that was followed in the study.

This section has dealt with procedures for identifying the objectives being pursued by teachers. In the following section consideration is given to the classification of kinds of educational objectives.

6. Classifying Instructional Objectives.

For a meaningful inquiry into instructional objectives covering a number of teaching subjects, an appropriate classification system is extremely useful. The structure-of-intellect model of Guilford[116] which detailed a matrix of intellectual factors is said to have latent implications for educational practice, but these implications have yet to be elaborated.

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116 J.P. Guilford, The Nature of Human Intelligence, New York, McGraw-Hill, 1967, p. 61-65.

Downey[117] made a synthesis of the major tasks of the public school by abstracting key elements from notable statements on the subject up to 1958. The four main elements were classified as intellectual, social, personal and productive, and each of these were subdivided into four making a conceptual framework which was used to investigate the various perceptions of people regarding the relative importance of the sixteen dimensions.[118] Ohikhena[119] modified the Downey instrument and used the modified version in investigating the preferred educational goals that certain groups of parents had with regard to schools. Analyzing the elements involved in the mastery of a learning task, Gagné[120] proposed hierarchical categories of abilities related to learning conditions, and emphasized the need to distinguish such categories so as to clarify the sets of conditions for optimal learning.

The chief orientation of the work of Guilford and of the work of Gagné appears to be toward guiding and informing

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117 Lawrence M. Downey, The Task of Public Education--the Perceptions of People, Chicago, Mid-West Administration Center, University of Chicago, 1960, iii-88 p.

118 Ibid., p. 24.

119 Titus Ofuovo Ohikhena, Values and Perceptions of Educational Objectives as Factors in Preferential Behavior, unpublished doctoral thesis presented to the University of Toronto, Ontario, 1970, ii-189 p.

120 Robert M. Gagné, The Conditions of Learning (2nd ed.), New York, Holt, Rinehart and Winston, 1970, p. 35.

the instructional process rather than to the classification of educational goals. The systems used by Downey and Ohikhena, while having clear implications for the instructional level, were concerned primarily with the institutional level. Accordingly, none of the classifications just reviewed was considered suitable for the present study. Very appropriate, on the other hand, was a taxonomy of educational objectives[121,122] produced by a group of college and university examiners and designed to resolve some of the confusion which resulted from the attempt to translate general instructional terms into specific behaviors.[123] The behavioral elements in instructional objectives were to be classified by the group of examiners into cognitive, affective and psychomotor behaviors, but up to the present they have completed just the cognitive and the affective domains. The former of these two deals with objectives related to thinking,

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121 Benjamin S. Bloom (ed.), Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I Cognitive Domain, New York, McKay, 1956, 1-207 p.

122 David R. Krathwohl, B.S. Bloom, and B.B. Masia, Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook II Affective Domain, New York, McKay, 1964, v-196 p.

123 David R. Krathwohl, "Stating Objectives Appropriately for Program, for Curriculum, and for Instructional Materials Development," Journal of Teacher Education, Vol. 16, No. 1, March 1965, p. 86.

knowing and problem solving, while the second includes objectives concerned with attitudes, values, interest, appreciation, and social-emotional adjustment. While the taxonomies promised to prove useful in evaluation and in curriculum building, it is stressed that a prime use was intended to be in the analysis and classification of objectives, specifically the type described earlier in this chapter as appropriate to the present research.[124]

The value of the taxonomies has been attested by a number of authorities. Lindvall[125] described them as constituting a major effort toward achieving the definition of specific instructional objectives. Dyer[126] referred to them as an enormous contribution to the provision of instruments and procedures for displaying and ordering a comprehensive range of educational outcomes, while they were recommended as an excellent source of educational objectives by Orlich and Shermis.[127] Bloom, Hastings and Madaus,[128] with the assistance of a number of notable educationists, produced an extremely

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124 Ibid., p. 84 and 89.

125 C.M. Lindvall, "Introduction," in Lindvall (ed.), op. cit., p. 7.

126 Dyer, op. cit., p. 11-12.

127 Orlich and Shermis, op. cit., p. 4.

128 Bloom, Hastings and Madaus, op. cit., p. vi.

comprehensive work on evaluation of student learning, the entire work being related to the taxonomies of educational objectives. All of these considerations seemed to support the decision to make use of the Bloom-Krathwohl taxonomies in the classification of the instructional objectives entering into the present study.

The focus of the foregoing section has been on the considerations leading to the choice of the Bloom-Krathwohl taxonomies as the framework within which to inquire into teachers' objectives. In the next section the appropriateness of such an inquiry at this time is demonstrated.

7. Timeliness of the Research.

A conclusion arising from the earlier sections of this chapter is that instructional objectives expressed in the behavioral model constitute a legitimate, potentially fruitful and worthwhile subject of inquiry. It is now furthermore claimed that such an inquiry is especially apposite at the present. In support of this contention reference can be made to the insistence of leading educationists on the present need for factual knowledge about the classroom learning situation as an essential prerequisite for advance in curriculum development and decision-making. Schwab expressed the point strongly:

> The practical arts begin with the requirement that existing institutions and existing practices be preserved and altered piecemeal, not dismantled and replaced. Changes must be so planned and so articulated with what remains unchanged that the functioning of the whole remains coherent and unimpaired. [...] A practical program of improvement of education [...] would effect its changes in small progressions, in coherence with what remains unchanged, and this would require that we know what is and has been going on in American schools. At present we do not know.[129]

Goodlad[130] earlier expressed a similar idea in asserting that promising alternatives in education frequently proved abortive because of a lack of short-term inquiries that would gather and interpret the essential pertinent data. The need for such inquiry is also implicit in Lortie's[131] criticism of the lack of alignment between instructional practices and statements of educational goals. In a similar vein, but with specific reference to the Canadian setting, Wees claimed that classroom activity is often confined to low-level cognitive activity, statements of more impressive purpose being hardly aims but rather mere hopes which are assumed "to be the

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129 Joseph J. Schwab, The Practical: A Language for Curriculum, Washington, D.C., National Education Association Center for the Study of Instruction, 1970, p. 29-30.

130 John I. Goodlad, "Thought, Invention and Research in the Advancement of Education," The Educational Forum, Vol. 33, No. 1, November 1968, p. 10.

131 Dan C. Lortie, The Cracked Cake of Educational Customs and Emerging Issues in Evaluation, Los Angeles, University of California Center for the Study of Evaluation of Instructional Programs, Occasional Report No. 19, September 1968, p. 16.

by-products of the process of acquiring a load of 'inert knowledge'."[132] After examining history and social studies teaching in 951 elementary and secondary classes in the ten provinces of Canada, Hodgetts[133] was highly critical of instructional practices. "Even if the deficiencies in subject matter were corrected through new programs," he wrote, "very little would be achieved until we also overhauled what still goes on in the classroom."[134] The provincial committee on aims and objectives of education in the schools of Ontario stated that it had received complaints about "inflexible programs, outdated curricula, [...] mistaken aims of education, [...] growing discontent and lack of confidence in a school system which [...] is failing those it exists to serve."[135]

Some research efforts have been directed toward the goals that schools are trying to achieve. Mason and Kendrick[136] found that examination papers in English were composed of

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132 W.R. Wees, The Way Ahead, Toronto, Gage, 1967, p. 24.

133 A.B. Hodgetts, What Culture? What Heritage? - A Study of Civic Education in Canada, Toronto, Ontario Institute for Studies in Education, 1968, 1-122 p.

134 Ibid., p. 59.

135 Living and Learning, p. 10.

136 G.P. Mason and H.R. Kendrick, A Taxonomic Analysis of the English 40, English 91 and English 100 Department Examinations, Victoria, B.C., University of Victoria, 1967, mimeo.

questions related almost exclusively to the three lowest levels of the cognitive domain of Bloom's taxonomy, despite teachers' insistence that they themselves attached considerable importance to the higher levels. The Thornlea studies showed that although teachers and pupils showed moderately close agreement on what constituted the most important educational goals, pupils' experience of what was actually taught in class led them to believe that they and the teachers did not agree on what the most important goals were.[137] A curriculum inquiry committee set up by the board of education of the borough of Etobicoke gathered information about curriculum objectives from close to twenty thousand people concerned with public and secondary schools in the borough. The report revealed that while teachers and pupils perceived low-level cognitive behavior as the actual outcome of schooling, both groups agreed that the outcomes of highest importance should be related to high-level cognitive and affective behaviors.[138]

While the views and research studies just briefly referred to do not constitute substantial evidence, there is

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137 Research Office of the York County Board of Education, The Thornlea Community Looks at Objectives for Its High School, York, York County Board of Education, September 1969, 1-32 p.

138 John D. Londerville et al., Curriculum Inquiry Committee, Report 1971, Study Documents, Etobicoke, Board of Education, Borough of Etobicoke, March 1971, Parts I-IV.

sufficient indication of an unsatisfactory situation to explain why it is that senior education officials feel that among their most urgent responsibilities are the evaluation of the school system and the formulation and interpretation of relevant objectives.[139] As a first step, the present researcher believes that studies should be undertaken to determine what it is that the classroom teacher is trying to achieve. Questions about whether the attempts are successful and whether the goals are adequate could be inquired into after the first step has been taken. Since behaviorally expressed objectives are accepted as the most meaningful expression of instructional goals, they are suitable for communicating clearly the purposes that teachers entertain with regard to student learning. The researcher considers that amid the prevailing uncertainty, contradiction and general lack of specific information, the words of Dyer are compelling: "I think the way out is to [...] concentrate on getting a clearer idea of what is happening in the schools right now, and making up our minds how much we like what we see."[140]

This chapter has reviewed the importance attached by society and by curriculum theorists to the area of educational

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139 H.R. Partlow, Our Educational Responsibilities and Our Degree of Accountability, address presented in London, Ontario, November 18, 1971, mimeo, 1-24 p.

140 Dyer, op. cit., p. 10.

goals. It has established principles for meaningful and precise expression of the goals that the classroom teacher is aiming at, and has considered procedures for identifying the goals that teachers pursue, as well as a suitable method of classifying such goals into kinds of learning behavior. Finally, it has shown that research into the objectives of teachers is particularly timely. The next chapter describes the design of a study of the instructional objectives of one group of high school teachers.

CHAPTER II

DESIGN OF THE STUDY

A definition of terms is first presented in this chapter, followed by a description of the rationale underlying the particular orientation of the research. The instrument used for gathering the data is explained, its validity and reliability are discussed, details about the participating population are given, and the procedures followed in the collection of data are outlined. The manner of training a rating team and the method used to analyze the data constitute the final sections of the chapter.

1. Definition of Terms.

Key terms used in the study and not explained in the Introduction are given below with the meanings ascribed to them.

(a) Cognitive domain.- The area of human behavior characterized most strongly by intellectual, learning and problem-solving activities.

(b) Cognitive levels.- Hierarchical levels of development related to the cognitive domain. The levels in ascending order are:

1 knowledge
2 comprehension
3 application
4 analysis
5 synthesis
6 evaluation

(c) Affective domain.- The area of human behavior characterized most strongly by feeling and emotion.

(d) Affective levels.- Hierarchical levels of development related to the affective domain. The levels in ascending order are:

1 receiving
2 responding
3 valuing
4 organization
5 characterization by a value or value complex

(e) Taxonomy of educational objectives (also referred to as the Bloom-Krathwohl taxonomies).- A descriptive educational-logical-psychological classification system of learning behaviors in the cognitive and affective domains devised by Bloom[1] and by Krathwohl et al.[2]

(f) Principal teaching subjects.- Chemistry, English, French, Geography, History, Mathematics.

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1 Benjamin S. Bloom (ed.), Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I Cognitive Domain, New York, McKay, 1956, 1-207 p.

2 David R. Krathwohl, B.S. Bloom, and B.B. Masia, Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook II Affective Domain, New York, McKay, 1964, v-196 p.

2. Particular Orientation of the Study.

The special orientation of this study is fourfold. It focuses on the classroom teacher, on six teaching subjects, on the grade twelve level, and on objectives with which teachers associate evaluation of related student behavior. The rationale underlying the concentration of these four elements is now explained.

A number of sources give support to the value of inquiry into the work of the classroom teacher. Eboch[3] and Shulman[4] are among those who stressed the value of concentrating inquiry on the functional setting of instruction, the former in urging that research must be more reality oriented than laboratory confined, and the latter in maintaining that educational research is inhibited by the failure to take cognizance of the total learning setting. In explaining his spontaneous theory of schooling, Stephens argued that apart from the learner himself the chief factor in learning is the teacher:

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3 Sidney C. Eboch, "The Value of Field Studies in Education," Theory into Practice, Vol. 6, No. 2, April 1967, p. 69.

4 Lee S. Shulman, "Reconstruction of Educational Research," Review of Educational Research, Vol. 40, No. 3, June 1970, p. 374.

> This teacher-centric attitude, stressed throughout the theory, is not motivated primarily by any humanitarian desire to provide the teacher with more autonomy nor to free him from unnecessary nagging anxieties. The emphasis comes, on the contrary, from the claims that the teacher is the crucial factor in the process, that his actual interests determine the effective curriculum, and that his minute-by-minute classroom activities are not susceptible to precise control by others but stem instead from ancient, beneficent tendencies deeply ingrained within him.[5]

The precise concern of this study, however, is with teachers' perceptions of their objectives. Consequently it focuses on teachers' intentions, and specifically on those which teachers consider that they try to operationalize. This researcher contends that the area of teacher intentions, while somewhat neglected in research, has a value strongly supported, in principle, in the relevant literature.

Medley and Mitzel[6] insisted that the competence of a particular teacher could not be assessed unless there is definite knowledge about the outcomes he is trying to achieve. These writers defined the competence of a teacher as "the average success of all his behaviors in achieving their intended effects."[7] Other writers have put similar emphasis on

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5 J.W. Stephens, The Process of Schooling: A Psychological Examination, New York, Holt, Rinehart and Winston, 1967, p. 12.

6 Donald M. Medley and Harold E. Mitzel, "The Scientific Study of Teacher Behavior," in Arno A. Bellack (ed.), Theory and Research in Teaching, New York, Teachers College, Columbia University, 1963, p. 79-90.

7 Ibid., p. 80.

the notion of intentions in teaching. Eisner[8] claimed that the one feature which all teaching has in common is the introduction into a situation of a set of conditions intended to influence the behavior of pupils. After examining three definitions that conceived teaching as basically a way of making things known to others, Smith[9] claimed that they were defective in that the definitions confused teaching with didactics. In opposition to what he regarded as the mistake of identifying teaching itself with the way in which teaching can be performed, Smith argued that "in its generic sense, teaching is a system of actions intended to induce learning."[10] Without modifying the primary emphasis on teacher intentions, Hughes added a further dimension in preferring to define teaching as "a form of interpersonal influence aimed at changing the behavior potential of another person."[11] In fact, Hughes' position seems to differ very little from

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8 Elliott W. Eisner, "Instruction, Teaching and Learning: An Attempt at Differentiation," The Elementary School Journal, Vol. 65, No. 3, December 1964, p. 118.

9 B. Othanel Smith, "A Concept of Teaching," in B.O. Smith and R.H. Ennis (eds.), Language and Concepts in Education, Chicago, Rand McNally, 1961, p. 86-101.

10 Ibid., p. 88.

11 Marie M. Hughes, "Utah Study of the Assessment of Teaching," in Bellack (ed.) op. cit., p. 26.

Smith's,[12] for the latter's pedagogical model also lays stress on the interpersonal element which Hughes emphasized.

In further support of the emphasis given in this study to the teachers' intentions, reference could be made to the belief of Goodlad[13] that ignoring teacher behavior has led educational thinkers to the erroneous assumption that there is substantial implementation of ideas and concepts commonly regarded as characteristic of schools. Stephens[14] pointed out that when teachers give verbal assent to educational propositions there is no guarantee that they take any steps to put such propositions into effect in the classroom. He reviewed a number of studies which demonstrated that student achievement seemed to be largely unaffected by so-called improvements directed toward the classroom, and documented the widespread concern over the discrepancy between the espoused curriculum on the one hand and the teacher-produced, de facto curriculum on the other.[15] The same problem has been referred to by Hughes[16] and again by Wallen and

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12 Smith, op. cit., p. 91-92.

13 John I. Goodlad, "Educational Change: A Strategy for Study and Action," Journal of Secondary Education, Vol. 46, No. 4, April 1971, p. 158.

14 Stephens, op. cit., p. 13.

15 Ibid., p. 152.

16 Hughes, op. cit., p. 33.

Travers[17] who complained that teaching has ignored research, that decisions are made on the basis of personal experience or vague theory, and that there is a general lack of relationship between teaching and current knowledge of learning. All of these considerations are seen as adding force to the claim that there is need for inquiry into the teacher's intentions, into what he believes he is trying to achieve.

The second element in the special orientation of this study is the confining of inquiry to six teaching subjects. The first reason for this particular choice of subjects is found in their categorization as belonging to the major teaching areas.[18] In the second place, inquiries made at a random selection of six of the high schools concerned in the study elicited the information that no other group of subjects involved as large a proportion of grade twelve students as were involved in chemistry, English, French, geography, history and mathematics.

The study is directed at grade twelve because of the comparative maturity of the pupils and because of the relative

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17 Norman E. Wallen and Robert M.W. Travers, "Analysis and Investigation of Teaching Methods," in N.L. Gage (ed.), Handbook of Research on Teaching, Chicago, Rand McNally, 1963, p. 484-494.

18 Benjamin S. Bloom, J. Thomas Hastings, and George F. Madaus, Handbook on Formative and Summative Evaluation of Student Learning, New York, McGraw-Hill, 1971, p. v.

freedom from the sort of extraneous pressures that could arise from university and college requirements. The principle that "maturation ordinarily facilitates instruction"[19] would gain ready acceptance among most teachers, and is implicit in the spiral-curriculum concept of Bruner[20] as well as in Inhelder and Piaget's[21] views on the effects of maturation on adolescent thinking. While grade thirteen students might have their studies directed to a degree by the entrance requirements of post-secondary educational institutions, it was considered that grade twelve pupils would be largely free from such immediate pressures, and so be able to pursue the potentialities of a subject, while being at the same time sufficiently mature to benefit from that sort of learning. Whatever may be true of teachers in other grades, it was concluded that the teachers of grade twelve subjects are in a position to pursue a comprehensive range of instructional objectives.

The study emphasizes the objectives with which teachers associate procedures for the evaluation of related student behavior. The reason for this lies in the researcher's desire

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19 Stephens, op. cit., p. 54.

20 Jerome S. Bruner, The Process of Education, Cambridge, Harvard University Press, 1960, p. 52-54.

21 Barbel Inhelder and Jean Piaget, The Growth of Logical Thinking from Childhood to Adolescence, New York, Basic Books, 1958, p. 337.

to identify the objectives that teachers realistically tried to achieve, rather than those to which they gave no more than verbal approval. This orientation of the research is supported by Goodlad,[22] and even more strongly by the Hall-Dennis report in its blunt statement that "the aims of all concerned with the process of education are more realistically expressed in what they do than in anyone's statement of what their aims should be."[23] Further support for the orientation of the research toward objectives that are evaluated is found in the strong endorsement by Tyler[24] of the principle that evaluation is essential for determining whether planned learning experiences are at all productive, as well as for ensuring that objectives have been made functional. This crucial orientation of the study is based also on the assertion of Taba[25] that evaluation has a direct and important effect on both teaching and learning. In this she is supported by Silberman[26] who

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22 Goodlad, op. cit., p. 158.

23 Living and Learning, Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario, Toronto, Ontario Department of Education, 1968, p. 73.

24 Ralph W. Tyler, Basic Principles of Curriculum and Instruction, Chicago, University of Chicago Press, 1949, p. 105.

25 Hilda Taba, Curriculum Development--Theory and Practice, New York, Harcourt, Brace and World, 1962, p. 313.

26 Charles E. Silberman, Crisis in the Classroom, The Remaking of American Education, New York, Random House, 1970, p. 347-348.

envisaged evaluation as an important concomitant of effective teaching and learning. Sergiovanni and Starratt[27] endorsed the same principle, as did the staff report of the Center for the Study of Instruction, which stated flatly that evaluation is the proof that rhetoric has been translated into learning behavior.[28]

Because of the emphasis of authorities, such as those quoted above, on the importance of evaluation for effective teaching and learning, the present study focuses especially on the objectives with which teachers associate evaluation of related student performance, and terms these operationalized objectives.

This section has explained the reasons for the special orientation of the research toward the objectives evaluated by the teachers of six subjects at grade twelve level in high schools. The next section deals with the instrument used to collect data in accordance with this special orientation.

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27 Thomas J. Sergiovanni and Robert J. Starratt, Emerging Patterns of Supervision: Human Perspectives, New York, McGraw-Hill, 1971, p. 231-232.

28 Warren T. Greenleaf and Gary A. Griffin, Schools for the Seventies and Beyond: A Call to Action, Washington, D.C., National Education Association, 1971, p. 65.

3. Instrument Used to Collect the Data.

Part of the review of the literature[29] led to the conclusion that information about teachers' objectives should be gained by using prepared lists of behaviorally stated objectives. These were initially drawn from the comprehensive work by Bloom, Hastings and Madaus on the evaluation of student learning.[30] The authors included chapters by experts dealing with the major teaching areas and presenting a range of appropriate objectives based on the Bloom-Krathwohl taxonomies, with associated learning behaviors defined and illustrated by means of relevant evaluation procedures. The work of these authors was used to produce an initial listing of objectives for each subject, the objectives corresponding to a comprehensive range of general learning outcomes along with associated student behaviors. The lists of objectives were then examined and amended where judged necessary by a group consisting of subject consultants for high schools of the Ottawa Board of Education, specialist teachers, and some other teachers who had previous experience of at least two years' duration in teaching the appropriate subjects at grade twelve level in Ottawa high schools. The task of the group, which contained

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29 Chapter I, section 5, p. 35-37.

30 Bloom, Hastings and Madaus, op. cit., v-923 p.

no potential respondent for the study, was to ensure that the objectives for each subject were comprehensive, were expressed in terms meaningful to Ottawa high school teachers, and approximated to the grade twelve level. The lists of objectives were subsequently used in a pilot study involving grade twelve teachers from independent high schools in Ottawa, but the only changes found necessary in the light of the comments made by these pilot respondents concerned typographical errors.

The objectives drawn up as just outlined constituted the major section of the response form used to collect the data. The form itself, which is reproduced in Appendix 1, was composed of the following parts:

1. A letter from the researcher inviting the cooperation of the grade twelve teachers of the six subjects.

2. Full but concise directions as to what was asked of respondents, and information about the method of returning the response form.

3. A list of objectives for the subject that the respondent was teaching. Three columns were ruled alongside the listed objectives, in the first of which the respondent was to place a check mark if he considered the objective appropriate to the course he was teaching, in the second he was to mark a check if he had included the objective in his teaching program for the 1970-71 school year, and he was to check the third

column if he had a definite method of directly evaluating student performance related to the objective.

4. A sheet of paper, blank but for the three ruled columns at the right. On this the directions invited respondents to write objectives important to them in their teaching but not appearing among the objectives presented to them in the main section of the response form.

This third part of the chapter has described the manner of drawing up, and the final format, of the response form used in the research. Questions of validity and reliability are considered in the section that follows.

4. Validity of Response Form and Reliability of Data.

Basically the response form was designed to provide a general measure of the acceptance that teachers accorded a range of instructional objectives. While heeding, and endeavoring to take every precaution against, the deficiencies associated with a questionnaire-type instrument;[31,32] the researcher accepted

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31 William Wiersma, Research Methods in Education: An Introduction, Philadelphia, J.P. Lippincott, 1969, p. 270-289, and

32 J.D. Nisbet and N.J. Entwistle, Educational Research Methods, London, University of London Press, 1970, p. 44-53.

The above authors have given a recent summary of these deficiencies.

the judgment that the "questionnaire can serve a very definite purpose in the advancement of education at its present stage of development."[33]

Primary attention was given to ensuring that the response form was calculated to provide the general measure of teacher acceptance spoken of above. In accordance with the prescriptions of Fox[34] the chief concern was that the content of the form should reflect the results of research studies in the field, as well as allowing for free-response data. The response form used in the study is claimed to meet these two criteria. The objectives used were drawn initially from the authoritative work by Bloom, Hastings and Madaus[35] who, stressing the close connection between evaluation and objectives, asserted that they had brought together "the best of evaluation techniques in general, as well as in each of the major subject disciplines and levels of education."[36] The material derived in the first place from this source was modified, as described in section three above, by educationists with practical knowledge of the relevant aspects of instruction in Ottawa high

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33 George J. Mouly, The Science of Educational Research (2nd ed.), New York, Van Nostrand Reinhold, 1970, p. 263.

34 David J. Fox, The Research Process in Education, New York, Holt, Rinehart and Winston, 1969, p. 370.

35 Bloom, Hastings, Madaus, op. cit., v-923 p.

36 Ibid., p. v.

schools. The validity of the instrument is related directly to this twofold source. Regarding the second criterion, allowing for free-response data, provision was made for respondents to write-in objectives which they felt had been omitted, the major part of the response form provided them with models to follow in doing this, and they were encouraged to undertake it by the assurance given in the directions to respondents that considerable importance would be attached to the objectives which they added in this manner.

In addition to the two elements just described, there was built into the response form a feature calculated to foster validity. This concerned the special significance attached to the objectives with which teachers indicated that they associated evaluation of related student behavior. The researcher took the view that there could be no surety that anything had been taught or learned unless there was some form of evaluation of learning outcomes.[37] Section two of this chapter explains the basis on which that view is built. Far from being made aware of the special importance attached to the third column of the response form, respondents were indirectly invited by the directions to ignore the third column except for the objectives to which they saw it clearly applied.

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37 Ibid., p. 22.

In the light of the foregoing considerations, the instrument used in the research is believed to have had face validity and content validity, the latter being the strongest technique available to the survey researcher.[38]

Nixon[39] detailed fifty-two suggestions for the mechanical construction of questionnaires. He claimed that these constituted criteria of physical attractiveness and obvious consideration for the respondent, which would encourage a high percentage of replies. Not all of his suggestions proved applicable to this study, but a large number was followed. These included quality and size of paper, clear and attractive type-face, clear and orderly arrangement of contents, concise and unambiguous directions, carefully worded introductory letter, simple dispatch and return procedures, and follow-up methods that were persistent without creating annoyance.

In further attempting to achieve maximum reliability Mouly's[40] criteria were observed. The cover letter tried to stress the significance of the study, the important contribution it could make, and the fact that the recommendation of prestigious educational bodies showed that it was worthy of

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38 Fox, op. cit., p. 370.

39 John E. Nixon, "The Mechanics of Questionnaire Construction," Journal of Educational Research, Vol. 47, No. 7, March 1954, p. 481-487.

40 Mouly, op. cit., p. 263.

professional participation. The letter also made an appeal to teachers on the score that the study represented one of the few attempts to take cognizance of teacher attitudes toward their classroom activities. The study was described as unlikely to make any great demand on teachers' time. Being also clearly concerned with information not available elsewhere, the response form was not calculated to annoy respondents as being redundant or superfluous. A good deal of trouble was taken to ensure clarity in the directions, and to impress on teachers that replies were anonymous and confidential. The list of objectives was ordered from low-level cognitive at the start to more sophisticated types toward the end. Respondents therefore received encouragement and reinforcement in the early stages of answering. Finally, the study was carried out at a time of the year when the critical question of evaluation could best be answered, for the response form reached the teachers in the first days of May when they had all but completed the year's courses and were in a position to state what had actually been evaluated. In many cases, moreover, the teachers were preparing final examination papers for their classes and were, at the very time of the survey, giving thought to what they would evaluate.

In short, it is affirmed that within the limits imposed on the study by the Ottawa Board of Education, every step was

taken to ensure validity and reliability with regard to the response form used in the research. The section that now follows provides details of the procedures that were used in collecting data.

5. Collection of Data.

The procedures followed in the collection of data were prescribed by the research department of the Ottawa Board of Education. The initial request to the Board for permission to conduct the research was supported by a letter from the Faculty of Education of the University of Ottawa. After approval was granted the researcher discussed procedures with Dr. G. Halpern of the Board, who then wrote to the high school principals giving the salient details of the research and inviting their cooperation. Specifically, each principal was asked to nominate a secretary through whom the researcher could contact respondents, and in most cases the principals issued a memorandum to all grade twelve teachers of the six subjects inviting them to answer the response form. Dr. Halpern's letter to the high school principals is found at the beginning of Appendix 1.

The researcher contacted each principal personally. It was felt that this personal element might dispose the principals to increased cooperation. Moreover, the opportunity was thereby provided for answering questions and for learning the

name of the secretary through whom the distribution of response forms was to be conducted. In the main the research project clearly was not well received by principals. Without being unpleasant many principals explained that in their opinion far too many demands were being made on teachers' time by such projects. In one case the researcher reached the principal's office at the very time he was preparing a letter to the Director of Education protesting about the number of surveys being sent to teachers. In some cases, however, generous cooperation was freely given.

Copies of the response forms were delivered to the designated secretaries. The forms were grouped according to subjects, the appropriate bundle being handed to each department head by the secretary. Each teacher then received a response form and a plain envelope for return, both enclosed in a second envelope marked simply with the name of the subject.

After one week the researcher asked the secretaries to remind respondents about the return of the forms. The collection of these from each school was carried out on a day decided in consultation with the designated secretary. In all cases extra time was needed while the secretaries issued reminders to potential respondents and tried to get as many forms as possible completed. The researcher's experience of dealing

with the secretaries in the different schools led him to believe that the attitude of the secretary toward the project and the relationship that the secretary had with the teaching staff were significant factors affecting the number of returns from each school. Table I gives details of the potential and actual respondents from each of the thirteen participating schools.

This section has explained the measures taken to gather the data relevant to the research. In the next section the method followed in classifying the respondents' objectives in accordance with the Bloom-Krathwohl taxonomies is detailed.

6. Classification of Objectives.

The first stage in connection with the classification of the objectives from the response forms was the selection of a classifying team. The researcher selected these from a class to which he taught a course in Curriculum Theory and Practice in the fall of 1971 within the Faculty of Education at the University of Ottawa. From the dozen graduate students who volunteered to undertake the classifying in lieu of a class assignment, the researcher chose ten who had at least three years experience as high school teachers, and who had given evidence in the course of a serious and intelligent approach to their studies.

Table I.-

Potential and Actual Respondents.

School	Subject: Chem a	Chem b	Eng a	Eng b	Fren a	Fren b	Geog a	Geog b	Hist a	Hist b	Math a	Math b	No. of Respondents a	No. of Respondents b	Percentage Response
S 1	5	5	6	7	4	5	2	4	2	7	4	7	23	35	66
S 2	2	2	6	6	2	2	3	3	3	3	4	4	20	20	100
S 3	3	4	6	6	3	5	2	3	3	4	5	5	22	27	81.5
S 4	3	4	3	3	5	5	2	3	4	4	5	5	22	24	92
S 5	1	2	2	5	4	5	2	3	4	4	5	5	18	24	75
S 6	2	2	1	2	2	2	1	1	1	2	1	2	8	11	73
S 7	3	3	2	5	3	3	1	2	2	3	3	3	14	19	74
S 8	3	3	3	6	1	3	2	2	5	6	2	3	16	23	70
S 9	3	4	5	7	3	5	2	4	1	4	3	5	17	29	59
S 10	2	2	-	5	2	2	-	-	1	2	3	5	8	16	50
S 11	2	2	2	3	4	4	1	1	1	3	1	3	11	16	69
S 12	1	5	5	7	3	5	2	4	3	7	2	7	16	35	46
S 13	3	3	3	3	1	1	4	5	3	3	2	4	16	19	84
Resp: Actual	33		44		37		24		33		40		211		
Potential	41		65		47		35		52		58		298		
% Response	80.5		68.0		79.0		69.0		63.5		69.0		71.0		

a: No. of actual respondents.
b: No. of potential respondents.
S: School number.

As part of their regular course work as well as in two teaching sessions directed to them alone, the members were given an understanding of the different kinds of educational goals with special reference to the ways in which societal aims, institutional purposes and educational objectives differ from one another in purpose, content and mode of expression. Instruction on these matters followed closely the relevant sections of the review of literature as given in chapter one of the present report, and also borrowed heavily from the concise work by Gronlund.[41]

The third stage in the preparation of the classifying team involved an examination and explanation of the Bloom-Krathwohl taxonomies of educational objectives. For this purpose use was made of the condensed version of the taxonomies published originally in the handbook by Krathwohl et al.[42] and reprinted in a text[43] of which all ten members of the classifying group had copies.

There followed training sessions of two kinds. The first kind involved general discussion by the group of the

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[41] Norman E. Gronlund, Stating Behavioral Objectives for Classroom Instruction, Toronto, Collier-Macmillan, 1970, iii-58 p.

[42] Krathwohl, Bloom and Masia, op. cit., p. 176-193.

[43] Robert J. Kibler, Larry L. Barker and David T. Miles, Behavioral Objectives and Instruction, Boston, Allyn and Bacon, 1970, p. 47-66.

classification of each of fifty instructional objectives selected by the researcher from lists appearing in the text that the group was using.[44] The fifty objectives chosen covered all levels of the cognitive and the affective domains of the taxonomies. When it seemed that the group had gained a reasonably sound grasp of the taxonomic levels, the members were given six practice sessions in each of which a list of different kinds of instructional objectives was classified by the members of the team working independently, their classifications were then handed to the researcher, and finally they discussed the classifications as a group with the researcher so as to promote a uniform interpretation of the taxonomic levels. After each practice session the researcher calculated the inter-rater reliability by means of a one-way analysis of variance using repeated measures. The principal numerical quantities used in the calculation of inter-rater reliability are given in Appendix 3 where reliability scores for the last five of the training sessions are shown to have been .83, .88, .87, .87 and .93.

After the sixth practice session each member of the classifying team was given a dossier containing twelve sets of objectives comprising the six lists of subject objectives

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[44] Ibid., p. 125-155.

originally presented to the teachers in the response forms, and another six lists comprising the objectives added by respondents in each of the six subjects. The ten classifiers were directed to work independently, to use only the condensed version of the taxonomy to guide them in their classifications, to choose times for classifying when they would not be liable to distraction, and to complete the work if possible within one week of the end of the training sessions. The final classification accepted for each objective was in accordance with the majority decision of the classifiers. As can be seen from Appendix 3 where all the classifications of the ten members are set out, there was no case where less than five members agreed on a classification. The condensed version of the taxonomy which they used is reproduced in Appendix 4.

This section, in which the procedures involved in the classification of the objectives have been explained, concludes the second chapter of the report. The chapter has outlined in detail the design of the study and will be followed by an account of the analysis of the data derived from the replies of respondents.

CHAPTER III

ANALYSIS OF DATA

This chapter analyzes the data in relation to the three propositions which are basic to the research and which are detailed in the introduction to the report. Since the first two propositions both involve an analysis of the responses for individual teaching subjects, the data relevant to these two propositions are considered in the first major section of the chapter. The second part of the chapter makes an analysis of the learning behaviors corresponding to the objectives of the six teaching subjects taken as a whole.

1. Analysis of the Data in Relation to Propositions One and Two.

The first two propositions around which the research has been conducted are as follows:

(i) The instructional objectives judged appropriate by a clear majority of grade twelve teachers of each of the six principal teaching subjects correspond closely to the objectives included in their teaching programs, and to those regarding which they evaluate related student performance.

(ii) The instructional objectives being aimed at by a clear majority of the grade twelve teachers of each of the six principal teaching subjects are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

It is clear from these propositions that most significance is to be attached to the data which apply to a clear majority of respondents. The researcher has arbitrarily accepted sixty per cent as constituting a clear majority.

The major section of the chapter that now follows is divided into six subsections in each of which data from one of the principal teaching subjects are analyzed. The subjects are taken in this order: chemistry, English, French, geography, history, mathematics.

(a) Chemistry.- Table II gives the classification of each objective as determined by the classifying team, the percentage of respondents who considered each objective appropriate to the course they were teaching, the percentage of respondents who included each objective in their teaching program for the year in which the study was conducted (1970-71), and finally the percentage of respondents who had a definite method of directly evaluating student performance with regard to each objective.

The twenty-five objectives presented to the teachers covered all levels of the cognitive domain, made reference to psychomotor behavior, and included all but the fifth level of the affective domain. The teachers appear to have found the list comprehensive and realistic, for in no case did less than seventy-nine per cent of respondents consider an objective

Table II.-

Classification of Chemistry Objectives and Percentages of Respondents Finding Objectives Appropriate, Including Them in Teaching Programs, and Evaluating Related Student Performance.

A	B	C	D	E
		Percentages of Respondents Who:		
Objective No.	Classification	found objec. appropriate	included objec.	evaluated performance
1	C 1	100	91	85
2	C 2	100	100	97
3	C 1	88	66.6	45.5
4	C 3	97	91	85
5	C 1	97	85	60.6
6	C 1	94	91	91
7	C 1	97	88	76
8	C 3	100	70	45.5
9	C 2	97	85	79
10	C 4	100	97	73
11	C 3	91	61	21
12	C 5	91	45.5	24
13	C 2	97	91	64
14	C 6	97	85	61
15	C 6	94	61	21
16	C 5	79	51.5	27
17	C 3	100	79	51.5
18	P	100	91	54.5
19	A 3	85	45.5	15
20	A 3	94	54.5	12
21	A 2	100	48.5	0
22	C 4	97	73	24
23	A 4	85	61	6
24	A 1	79	51.5	18
25	C 5	82	33	3

No. of Respondents: 33
C: Cognitive level.
A: Affective level.
P: Psychomotor.

appropriate, while only seven respondents saw the need to write in additional objectives. As none of the seven included an objective of the type which was not included among those presented to teachers, namely, affective level 5, it would seem that the absence of this type of objective from those presented to teachers did not constitute a deficiency of any significance. The additional objectives written in by respondents are analyzed in Table III.

When column D of Table II is compared with column C, marked differences are readily apparent. All twenty-five objectives received strong support from respondents as being appropriate, but the proportions of teachers taking the further step of including the appropriate objective in their teaching program varied widely. Figure 3 shows in a number of cases a substantial margin between the proportion of teachers judging an objective appropriate, and the proportion who then included that objective in their teaching program. Generally speaking, the discrepancy between the proportions for each objective widens from the fifth cognitive level through the affective levels. As shown in Table IV, however, the objectives included in their programs by a clear majority of teachers cover all cognitive levels except the fifth, synthesis, the only affective level included by sixty per cent or more of teachers being the fourth, organization of values. The support

Table III.-

Classification of Objectives Added by Respondents. (Chemistry)

Objective No.	Classification	Respondent	
1	C 1	S 1	R 1
2	A 4	S 1	R 1
3	A 1	S 1	R 1
4	A 1	S 1	R 1
5	C 1	S 1	R 4
6	C 1	S 3	R 1
7	C 5	S 8	R 1
8	C 6	S 8	R 1
9	C 3	S 8	R 1
10	C 5	S 8	R 1
11	C 1	S 8	R 3
12	C 6	S 8	R 3
13	C 1	S 8	R 3
14	A 2	S 9	R 2
15	C 6	S 9	R 2
16	C 2	S 11	R 2
17	C 3	S 11	R 2
18	C 4	S 11	R 2
19	C 5	S 11	R 2
20	A 3	S 11	R 2

S: School.
R: Respondent.
C: Cognitive level.
A: Affective level.

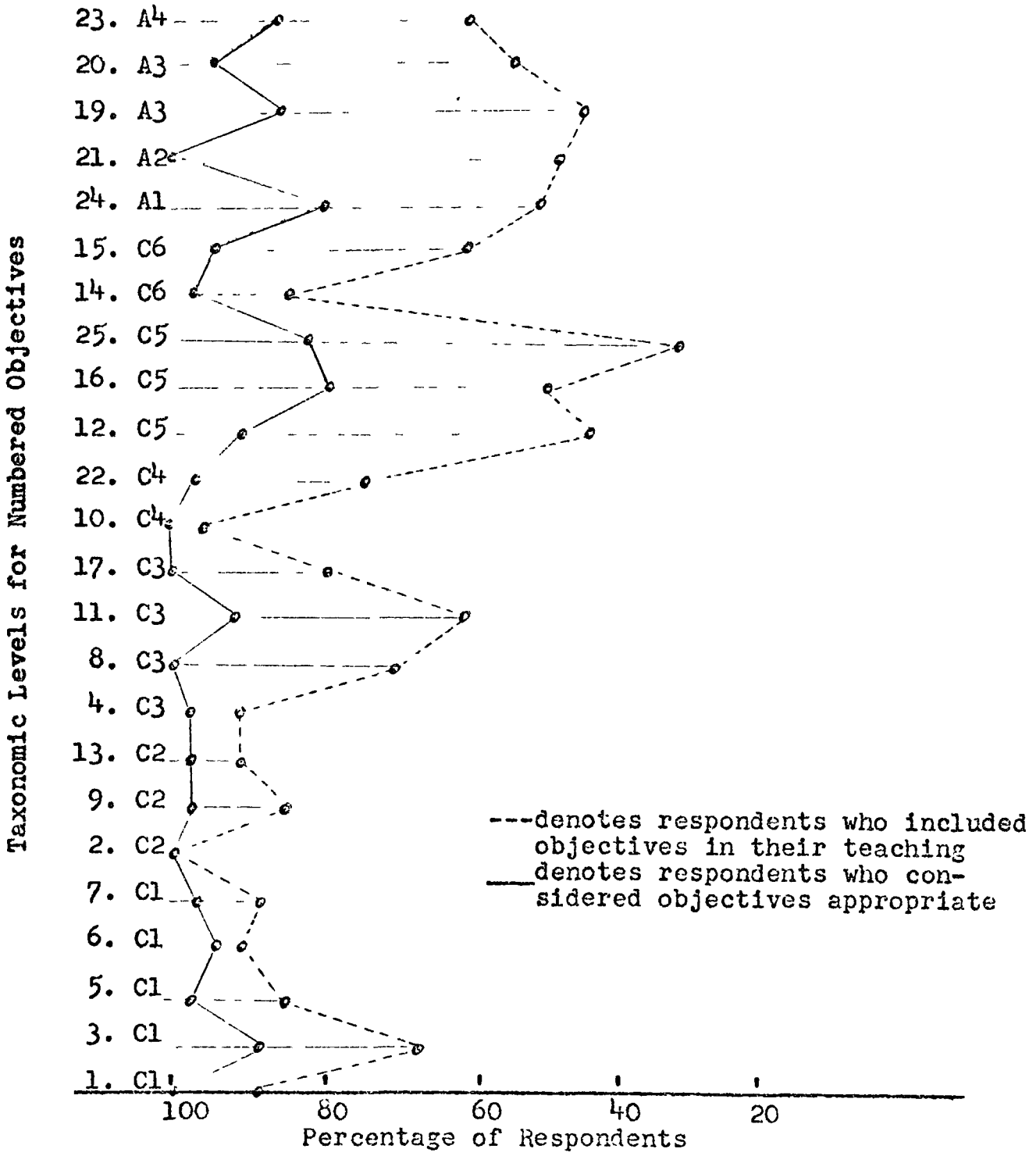

Figure 3.- Differences between Percentages of Chemistry Teacher Respondents who considered Objectives Appropriate to their course and Percentages of Respondents who included Objectives in their Teaching Program.

Table IV.-

Classification of the Objectives Included in Teaching Programs by a Clear Majority of Respondents. (Chemistry)

Objective No.	Classification	Percentage Including Objective
1	C 1	91
3	C 1	66.6
5	C 1	85
6	C 1	91
7	C 1	88
2	C 2	100
9	C 2	85
13	C 2	91
4	C 3	91
8	C 3	70
11	C 3	61
17	C 3	79
10	C 4	97
22	C 4	73
14	C 6	85
15	C 6	61
23	A 4	61
18	P	91

C: Cognitive level.
A: Affective level.
P: Psychomotor behavior.

given objectives representing the taxonomic levels that were neglected by the majority are detailed in Table V.

When consideration is given to objectives for which respondents have means of directly evaluating student performance, it is again found that there are marked differences between the numbers who include an objective in their teaching programs and the numbers who gave evidence of realistically operationalizing the objective through evaluation procedures. In fact, for only ten of the twenty-five listed objectives does a clear majority of respondents have some method of direct assessment. Table VI shows that these ten objectives are all cognitive, representing all levels except the fifth--synthesis. Regarding the other fifteen objectives, Table VII gives the percentages of respondents assessing student performance. Figure 4 depicts graphically for each objective the difference between the proportion of respondents who include an objective in their teaching program, and the proportion who evaluate student performance in relation to that objective. The data led to the conclusion that teachers are making a realistic attempt to operationalize objectives related to five of the six cognitive levels, while the affective domain, though included in their teaching by about half the respondents, is not subjected to any sort of evaluation by more than a small minority. Tables VI and VII along with Figure 4 make it clear

Table V.-

Classification of the Objectives Included in Teaching Programs by Less than a Clear Majority of Respondents. (Chemistry)

Objective No.	Classification	Percentage Including Objective
12	C 5	45.5 (91)[a]
16	C 5	51.5 (79)
25	C 5	33 (82)
24	A 1	51.5 (79)
21	A 2	48.5 (100)
19	A 3	45.5 (85)
20	A 3	54.5 (94)

C: Cognitive level.
A: Affective level.
a The percentages of respondents who considered the objectives appropriate to the course they were teaching.

Table VI.-

Classification of the Objectives for Which a Clear Majority of Respondents Evaluated Student Performance. (Chemistry)

Objective No.	Classification	Percentage Evaluating Performance
1	C 1	85 (91)[a]
5	C 1	60.6 (85)
6	C 1	91 (91)
7	C 1	76 (88)
2	C 2	97 (100)
9	C 2	79 (85)
13	C 2	64 (91)
4	C 3	85 (91)
10	C 4	73 (97)
14	C 6	61 (85)

C: Cognitive level.

a Percentage of respondents who included the objectives in their teaching programs.

Table VII.-

Objectives for Which Less than a Clear Majority of Respondents Evaluated Student Performance (Chemistry).

A Performance Evaluated by 40 - 60 Per Cent of Respondents			B Performance Evaluated by 20 - 40 Per Cent of Respondents			C Performance Evaluated by Less Than 20 Per Cent of Respondents		
No. of Objective	Classification	a b	No. of Objective	Classification	a b	No. of Objective	Classification	a b
3	C 1	67 45.5	11	C 3	61 21	25	C 5	33 3
8	C 3	70 45.5	22	C 4	73 24	24	A 1	51.5 18
17	C 3	79 51.5	12	C 5	45.5 24	21	A 2	48.5 0
18	P	91 54.5	16	C 5	51.5 27	19	A 3	45.5 15
			15	C 6	79 51.5	20	A 3	54.5 12
						23	A 4	61 6

C: Cognitive level.
A: Affective level.
P: Psychomotor behavior.
a: Percentage of respondents who included the objective in their teaching program.
b: Percentage of respondents who evaluated student performance in relation to the objective.

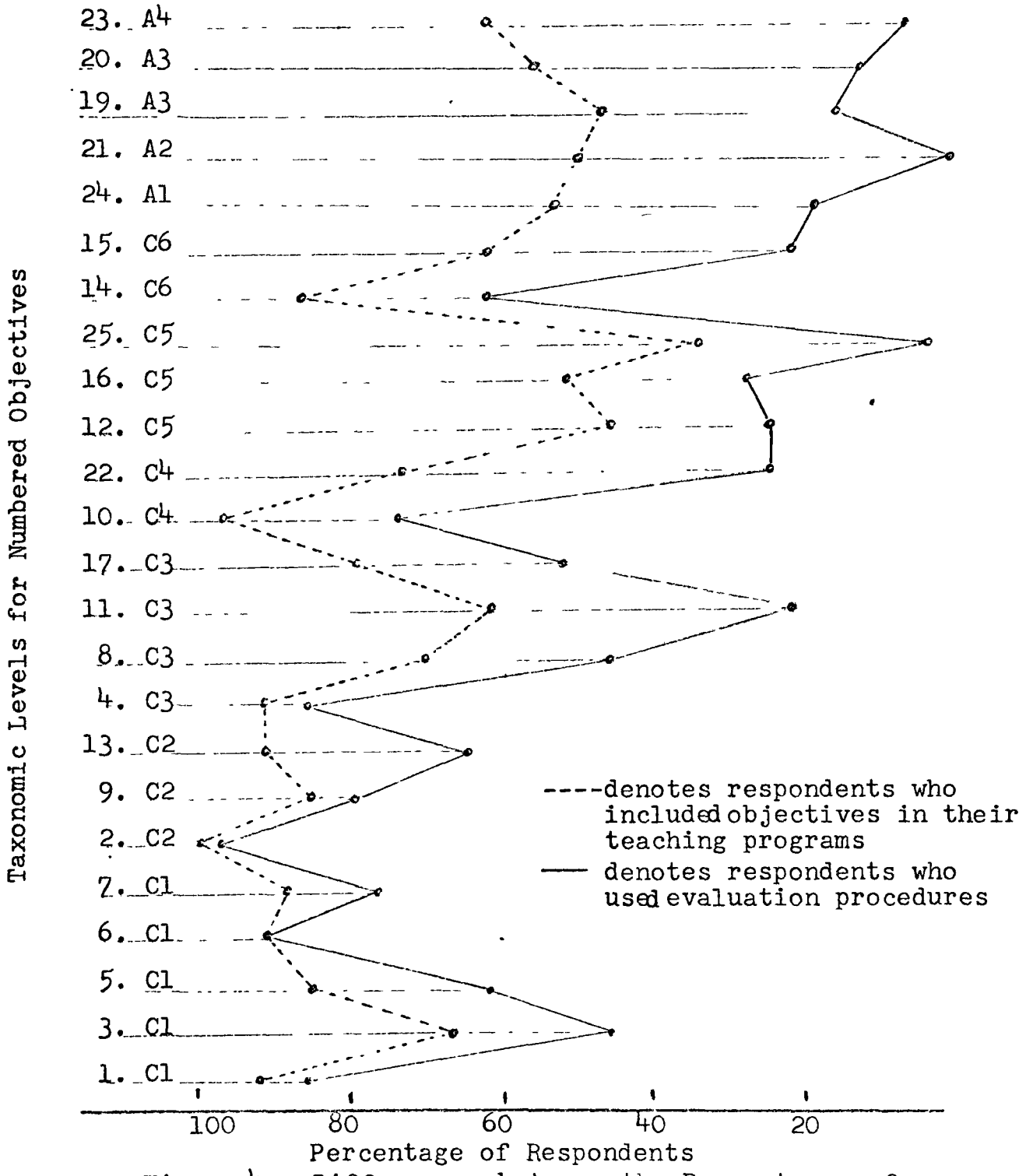

Figure 4.- Differences between the Percentages of Chemistry Teacher Respondents who included Objectives in their Teaching Programs and Percentages of Respondents who used Evaluation Procedures for Assessing Related Student Performance.

that it is by no means true that teachers believe that the inclusion of an objective in their teaching program creates a need to evaluate student performance with regard to that objective.

The foregoing analysis of the responses of grade twelve teachers of chemistry can now be related directly to the first two propositions. While there were twenty-five objectives that a clear majority of respondents judged appropriate to the course they were teaching, and eighteen of the twenty-five were included in the teaching program by a clear majority of respondents, for only ten objectives did a clear majority of teachers have a method of evaluating related student performance. If the principle is accepted that one cannot be sure of having taught anything unless related student performance is evaluated, it has to be concluded with regard to the first proposition in this study that of the twenty-five objectives presented to teachers and judged appropriate by most respondents, there are only ten that sixty per cent or more could affirm that they taught in some realistic fashion. As regards the second proposition, it can be added that the ten objectives are related to all the cognitive levels except the fifth, to none of the affective levels, nor to any form of psychomotor behavior.

(b) English.- An analysis of the responses of teachers of English along with the classification of the objectives into cognitive and affective levels is presented in Table VIII. The classification of the objectives added by respondents, along with some identification of the respondents involved, is given in Table IX. It can be seen from Table VIII that the objectives presented to teachers covered all six cognitive levels, and all affective levels except the first. Only one respondent wrote in an objective which was classified as first level affective, and another respondent added a psychomotor objective. In the light of an examination of column C of Table VIII it is concluded that at least seventy-five per cent of respondents found the listed objectives comprehensive and suitable. Support for this judgment is given in Table IX where it is seen that only eight of the forty-four respondents added objectives to the list, and except in two instances these objectives corresponded to levels included in the original list.

When attention is directed to those objectives which a clear majority of respondents included in their teaching programs, Table X shows that these objectives cover all the levels represented in the original list of objectives except affective level 3. Although a high proportion of respondents judged objectives 21 and 23 appropriate, only fifty-seven and

Table VIII.-

Classification of English Objectives and Percentages of Respondents Finding Objectives Appropriate, Including Them in Teaching Programs, and Evaluating Related Student Performance.

A	B	C	D	E
		Percentages of Respondents Who:		
Objective No.	Classification	found objec. appropriate	included objec.	evaluated performance
1	C 1	95.5	75	36
2	C 2	100	100	93
3	C 2	100	91	34
4	C 1	82	77	66
5	C 4	98	95.5	91
6	C 3	77	59	32
7	C 3	93	70.5	41
8	C 4	91	86	75
9	C 4	75	57	39
10	C 4	84	64	34
11	A 2	86	64	20.5
12	A 2	86	73	32
13	C 4	77	70.5	39
14	C 4	75	66	39
15	C 4	79.5	68	29.5
16	C 4	98	93	86
17	C 5	98	95.5	89
18	C 5	93	86	70.5
19	C 6	91	86	66
20	C 6	98	84	59
21	A 3	86	57	11
22	A 2	89	70.5	27
23	A 3	93	50	16
24	A 2	98	61	11
25	A 4	98	61	9

Number of Respondents: 44.
C: Cognitive level.
A: Affective level.

Table IX.-

Classification of Objectives Added by Respondents. (English)

Objective No.	Classification	Respondent
1	A 1	S 1 R 3
2	C 6	S 1 R 4
3	C 4	S 2 R 2
4	C 2	S 2 R 6
5	C 6	S 4 R 3
6	C 4	S 4 R 3
7	C 6	S 4 R 3
8	C 2	S 4 R 3
9	C 2	S 4 R 3
10	C 1	S 4 R 3
11	C 6	S 4 R 3
12	C 5	S 4 R 3
13	C 5	S 9 R 3
14	C 5	S 9 R 3
15	C 5	S 9 R 3
16	A 5	S 9 R 3
17	C 5	S 9 R 5
18	C 5	S 13 R 3
19	P	S 13 R 3

S: School.
R: Respondent.
C: Cognitive level.
A: Affective level.
P: Psychomotor behavior.

Table X.-

Classification of the Objectives Included in Teaching Programs by a Clear Majority of Respondents. (English)

Objective No.	Classification	Percentage Including Objective
1	C 1	75
4	C 1	77
2	C 2	100
3	C 2	91
7	C 3	70.5
5	C 4	95.5
8	C 4	86
10	C 4	64
13	C 4	70.5
14	C 4	66
15	C 4	68
16	C 4	93
17	C 5	95.5
18	C 5	86
19	C 6	86
20	C 6	84
11	A 2	64
12	A 2	73
22	A 2	70.5
24	A 2	61
25	A 4	61

C: Cognitive level.
A: Affective level.

fifty per cent respectively included these affective level 3 objectives. Only four objectives were included by less than a clear majority of respondents, and details of these are given in Table XI. It is to be noted that all of these objectives were included by a simple majority of respondents, and that in three of the four cases the percentage is only a few points short of the sixty per cent accepted as constituting a clear majority.

The differences between the percentages of respondents judging objectives appropriate and the percentages including the objectives in their teaching programs can be seen by comparing columns C and D of Table VIII, and also in the diagrammatic presentation in Figure 5. For the first, fourth, fifth and sixth cognitive levels there are examples where the differences are relatively small, but in general they are seen to increase as the affective levels are considered in turn. It should be repeated, nevertheless, that twenty-one of the twenty-five objectives judged appropriate were included in teaching programs by a clear majority of respondents.

A more important issue, however, concerns those objectives for which a clear majority of respondents had some definite method of directly evaluating student performance. Table XII, while providing the information which is relevant, draws attention to the differences between the proportions

Table XI.-

Classification of the Objectives Included in Teaching Programs by Less than a Clear Majority of Respondents. (English)

Objective No.	Classification	Percentage Including Objective
6	C 3	59 (77)[a]
9	C 4	57 (75)
21	A 3	57 (86)
23	A 3	50 (93)

C: Cognitive level.
A: Affective level.
a Percentages of respondents who considered the objectives appropriate to the course they were teaching.

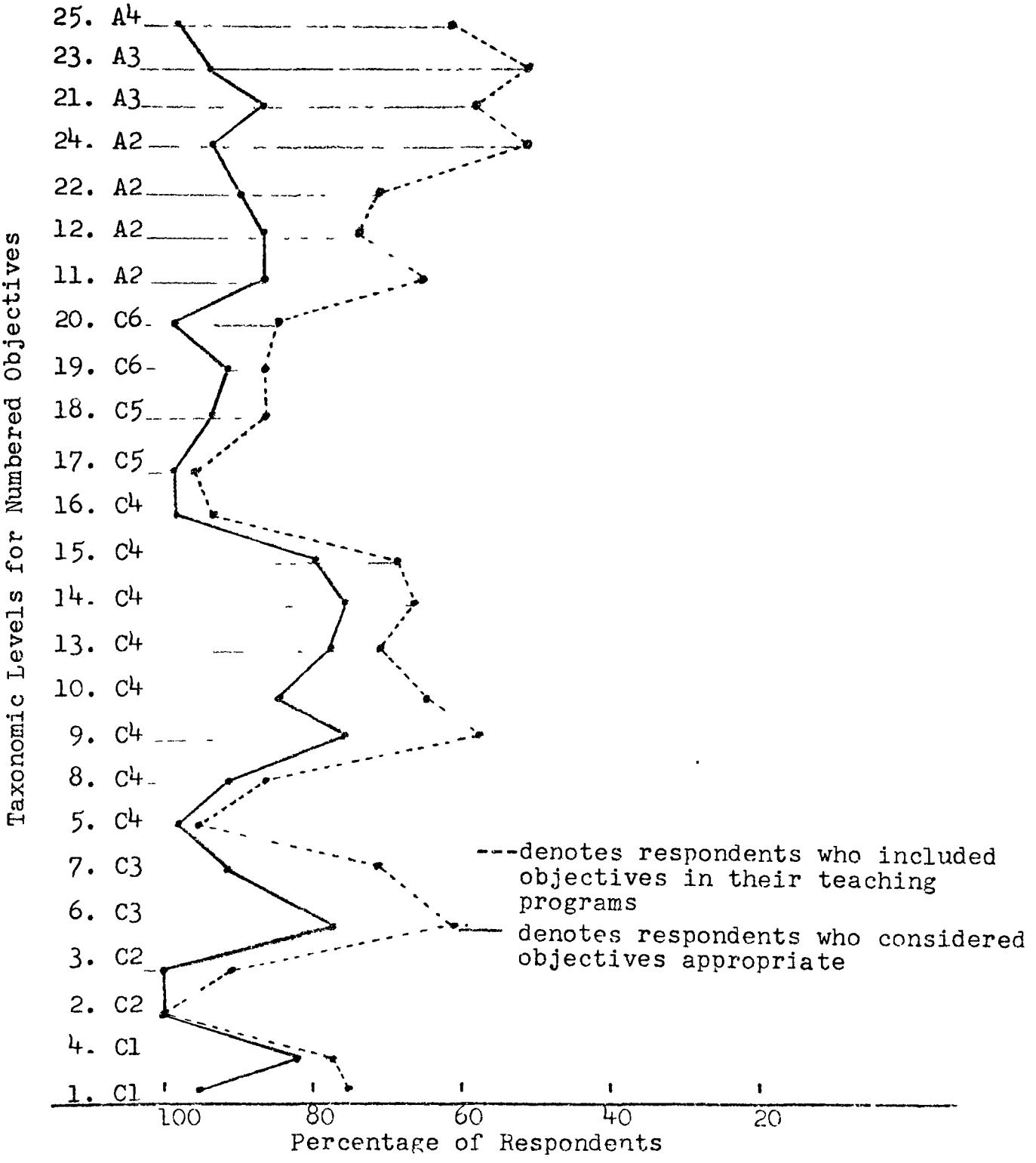

Figure 5.- Differences between Percentages of English Teacher Respondents who considered Objectives Appropriate to Their Course and Percentages of Respondents who included Objectives in their Teaching Programs.

Table XII.-

Classification of the Objectives for Which a Clear Majority of Respondents Evaluated Student Performance. (English)

Objective No.	Classification	Percentage Evaluating Performance
4	C 1	66 (77)[a]
2	C 2	92 (100)
5	C 4	91 (95.5)
8	C 4	75 (86)
16	C 4	86 (93)
17	C 5	89 (95.5)
18	C 5	70.5 (86)
19	C 6	66 (86)

C: Cognitive level.
a Percentage of respondents who included the objectives in their teaching programs.

of respondents including objectives in their teaching programs and the proportions who evaluated student behavior in relation to those objectives. Table XIII gives similar information about those objectives for which related student behavior was evaluated by less than a clear majority of respondents. Figure 6 shows that for most objectives the differences referred to are substantial. It is clear from Table XII that the only learning outcomes evaluated by a clear majority of the English teacher respondents are related to cognitive levels 1, 2, 4, 5, and 6. Table XIII shows that for seventeen of the original twenty-five objectives, respondents using related evaluation procedures constituted less than a clear majority. The percentages shown under each classification level in Table XIII indicate substantial differences between the numbers of respondents who included objectives in their teaching programs and the numbers who used evaluation procedures in relation to the objectives. From the information in Tables XII and XIII it is concluded that the respondents could be justified only in claiming that they operationalized cognitive outcomes, and while a clear majority included most of the affective outcomes in their teaching programs, a minority of respondents took steps to check on the effectiveness of their teaching in this domain.

Table XIII.-

Objectives for Which Less than a Clear Majority of Respondents Evaluated Student Performance (English).

A Performance Evaluated by 40 - 60 Per cent of Respondents			B Performance Evaluated by 20 - 40 Per Cent of Respondents			C Performance Evaluated by Less Than 20 Per Cent of Respondents		
No. of Objective	Classification		No. of Objective	Classification		No. of Objective	Classification	
	a	b		a	b		a	b
7	C 3		1	C 1		24	A 2	
	70.5	41		75	36		61	11
20	C 6		3	C 2		21	A 3	
	84	59		91	34		86	11
			6	C 3		23	A 3	
				59	32		50	16
			9	C 4		25	A 4	
				57	39		61	9
			10	C 4				
				64	34			
			13	C 4				
				70.5	39			
			14	C 4				
				66	39			
			15	C 4				
				68	29.5			
			11	A 2				
				64	20.5			
			12	A 2				
				73	32			
			22	A 2				
				70.5	22			

C: Cognitive level.
A: Affective level.
a: Percentage of respondents who included the objective in their teaching program.
b: Percentage of respondents who evaluated student performance in relation to the objective.

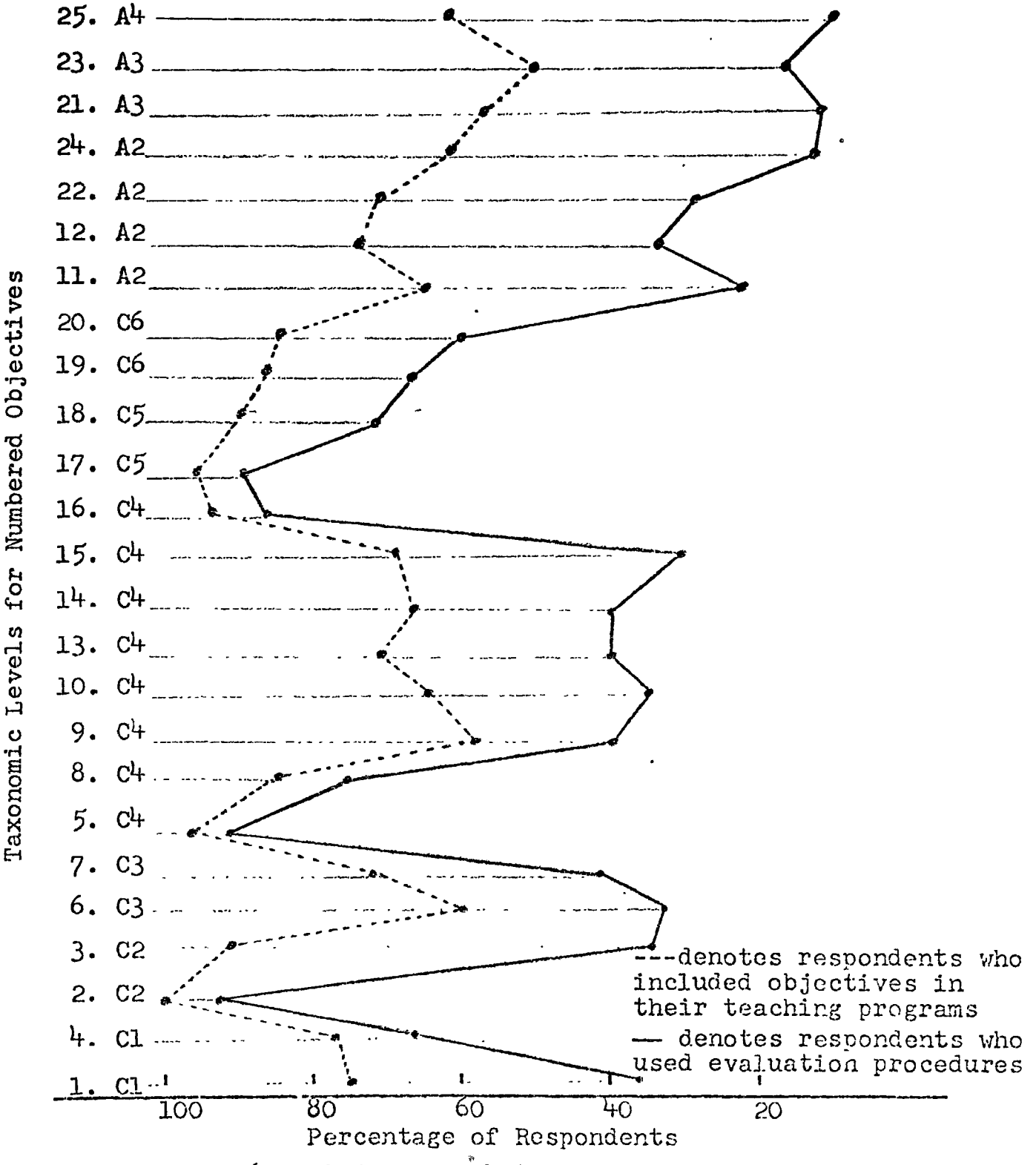

Figure 6.- Differences between the percentages of English Teacher Respondents who included objectives in their Teaching Programs and percentages of Respondents who used Evaluation Procedures for Assessing Related Student Performance.

The foregoing analysis of the responses of English teachers can now be related directly to the first two of the propositions that are basic to the present research. Every objective of those presented to teachers was considered appropriate by a clear majority of respondents, no objective being supported in this regard by less than seventy-five per cent of respondents. The objectives judged appropriate by a clear majority covered all cognitive levels and affective levels 2, 3, and 4, while a clear majority included all but four of the objectives, these corresponding to all cognitive levels and affective levels 2 and 4. A clear majority of respondents had some definite method of directly evaluating student performance in relation to eight of the objectives, all of these being classified as cognitive. Only a minority of respondents, ranging from nine per cent to thirty-two per cent, evaluated student performance in relation to affective outcomes.

(c) French.- The objectives presented to the teachers of French and the objectives added by respondents along with the classification into cognitive and affective levels are presented in Tables XIV and XV.

A particularly notable feature of the objectives presented to teachers of French is that they cover only the first three cognitive levels and the first three affective levels.

Table XIV.-

Classification of French Objectives and Percentages of Respondents Finding Objectives Appropriate, Including Them in Teaching Programs, and Evaluating Related Student Performance.

A	B	C	D	E
		Percentages of Respondents Who:		
Objective No.	Classification	found objec. appropriate	included objec.	evaluated performance
1	C 1	97	75	67
2	C 3	100	86	72
3	C 2	94	61	44
4	C 3	100	78	69
5	C 2	100	86	61
6	C 3	72	36	14
7	C 3	97	83	55.5
8	A 1	94	50	28
9	A 1	80.5	72	14
10	A 2	89	61	11
11	A 2	92	42	17
12	A 3	83	75	3

Number of Respondents: 36
C: Cognitive level.
A: Affective level.

Table XV.-

Classification of Objectives Added by Respondents. (French)

Objective No.	Classification	Respondent	
1	A 3	S 1	R 1
2	C 3	S 1	R 4
3	C 1	S 3	R 1
4	A 2	S 4	R 4
5	C 3	S 4	R 4
6	C 3	S 5	R 2
7	C 3	S 5	R 2
8	C 3	S 5	R 2
9	C 1	S 6	R 1
10	A 2	S 6	R 1
11	A 1	S 7	R 2
12	C 1	S 7	R 2
13	A 2	S 7	R 2
14	C 3	S 7	R 2
15	C 3	S 7	R 2
16	C 3	S 7	R 3
17	A 2	S 7	R 3
18	C 2	S 11	R 1
19	C 2	S 11	R 1
20	C 1	S 11	R 1
21	A 1	S 11	R 4
22	A 2	S 11	R 4
23	C 3	S 12	R 2
24	C 2	S 12	R 2
25	A 2	S 12	R 3

S: School.
R: Respondent.
C: Cognitive level.
A: Affective level.

By comparison with the objectives for chemistry and English, they are not only fewer in number, but also appear less comprehensive. At first glance this seems to account for the large number of objectives shown in Table XV as added by respondents, but on analysis the added objectives are found to cover no cognitive or affective levels other than those corresponding to the objectives presented to the teachers. Twelve respondents wrote-in additional objectives, but in the main these simply paraphrased those already appearing on the prepared list. It is worthy of emphasis that the top three cognitive and the top two affective levels are represented neither in the prepared list of objectives nor among the objectives added by respondents. The objectives presented to the teachers were all considered appropriate by a clear majority of respondents, only one, number 6, cognitive level 3, being judged appropriate by less than eighty per cent.

The differences between the proportions of respondents finding objectives appropriate and the proportions including the objectives in their teaching programs can be seen by comparing columns C and D of Table XIV, and from the diagrammatic presentation in Figure 7. For objectives 9 and 12, affective levels 1 and 3, the differences are less than ten per cent, but generally they are more substantial, being over thirty per cent in four cases, objective 3, cognitive level 2; objective 6,

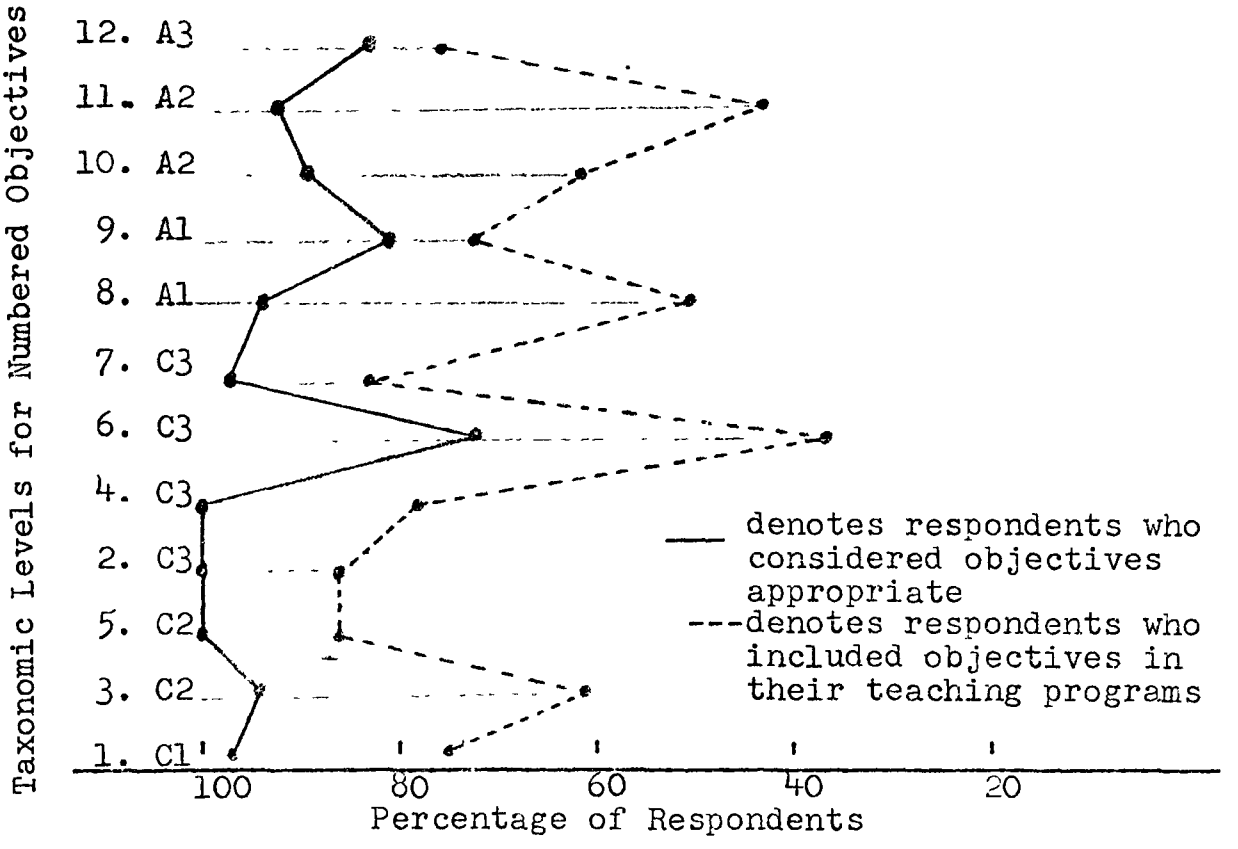

Figure 7.- Differences between Percentages of French Teacher Respondents who considered objectives appropriate to their Course and Percentages of Respondents wno Included Objectives in their Teaching Programs.

cognitive level 3; objective 8, affective level 1; and objective 11, affective level 2.

The objectives included in teaching programs by a clear majority of respondents are shown in Table XVI. Since all cognitive and affective levels represented in the original list of objectives are found in Table XVI, it can be concluded that the range of objectives included in teaching programs by French teacher respondents is as comprehensive as that found in the objectives presented to teachers. As already stated, the notable feature is that not even one respondent suggested a broadening of this apparently restricted range of educational outcomes. Table XVII gives details of the three objectives included in teaching programs by less than a clear majority of respondents. It is to be noted that while in all three cases a solid majority of respondents judged these objectives appropriate, in each case only about half took the further step of including the objective in their teaching programs.

The most important aspect of the objectives, however, concerns those for which a clear majority of respondents had some definite method of directly evaluating student performance. Only four of the objectives fit this condition, details of these being given in Table XVIII. It is to be noted that evaluation is restricted to learning outcomes corresponding

Table XVI.-

Classification of the Objectives Included in Teaching Programs by a Clear Majority of Respondents. (French)

Objective No.	Classification	Percentage Including Objective
1	C 1	75
3	C 2	61
5	C 2	86
2	C 3	86
4	C 3	78
7	C 3	83
9	A 1	72
10	A 2	61
12	A 3	75

C: Cognitive level.
A: Affective level.

Table XVII.-

Classification of the Objectives Included in Teaching Programs by Less than a Clear Majority of Respondents. (French)

Objective No.	Classification	Percentage Including Objective
6	C 3	36 (72)[a]
8	A 1	50 (94)
11	A 2	42 (92)

C: Cognitive level.
A: Affective level.
a Percentages of respondents who considered the objectives appropriate to the course they were teaching.

Table XVIII.-

Classification of the Objectives for Which a Clear Majority of Respondents Evaluated Student Performance. (French)

Objective No.	Classification	Percentage Evaluating Performance	
1	C 1	67	(75)[a]
5	C 2	61	(86)
2	C 3	72	(86)
4	C 3	69	(78)

C: Cognitive level.

a Percentage of respondents who included the objectives in their teaching programs.

to the three lowest cognitive levels. Table XIX shows the proportions of respondents evaluating student performance in relation to the other objectives and, as in the previous table, there is indication of the percentage differences between respondents including objectives in their teaching programs and those evaluating student behavior in relation to the objectives. The same information is presented in diagrammatic form in Figure 8, where it is seen that the differences are the greatest for the affective objectives. Table XIX shows, however, that for eight of the twelve objectives, the differences referred to are substantial. Finally, the data in Tables XVIII and XIX show that while a clear majority of teachers included in their programs objectives related to the first three cognitive levels and the first three affective levels, only the objectives that belong to the first three cognitive levels were operationalized by a clear majority of respondents.

The foregoing analysis of the responses of teachers of French can now be related directly to the first two of the propositions that are basic to the present research. All twelve of the objectives presented to teachers were judged appropriate by a clear majority of respondents, nine of the twelve being included by a clear majority in teaching programs, the nine corresponding to the first three cognitive levels and

Table XIX.-

Objectives for Which Less than a Clear Majority of Respondents Evaluated Student Performance (French).

A Performance Evaluated by 40 - 60 Per Cent of Respondents			B Performance Evaluated by 20 - 40 Per Cent of Respondents			C Performance Evaluated by Less Than 20 Per Cent of Respondents		
No. of Objective	Classification	a b	No. of Objective	Classification	a b	No. of Objective	Classification	a b
3	C 2	61 44	8	A 1	50 28	6	C 3	36 14
7	C 3	83 55.5				9	A 1	72 14
						10	A 2	61 11
						11	A 2	42 17
						12	A 3	75 3

C: Cognitive level.
A: Affective level.
a: Percentage of respondents who included the objective in their teaching program.
b: Percentage of respondents who evaluated student performance in relation to the objective.

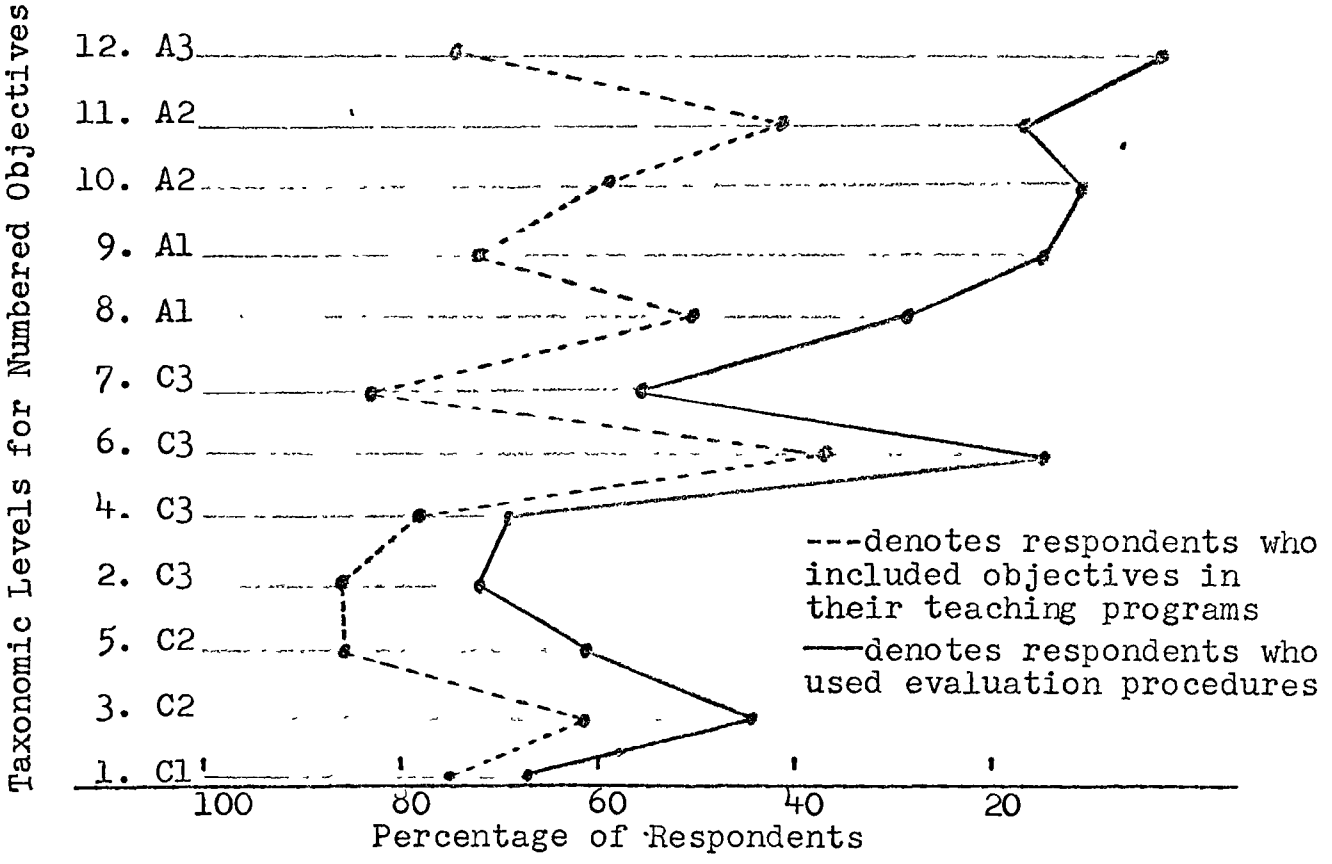

Figure 8.- Differences between the Percentage of French Teacher Respondents who included Objectives in Their Teaching Programs and Percentages of Respondents who used Evaluation Procedures for Assessing Related Student Performance.

the first three affective levels. In only four of the twelve cases did a clear majority have some definite method of directly evaluating related student performance, the four objectives in question representing cognitive levels 1, 2, and 3. Only a minority of respondents (Table XIX) ranging from three to twenty-eight per cent, evaluated student performance in relation to affective outcomes.

(d) Geography.- An analysis of the responses of teachers of grade twelve geography along with the classification of objectives into cognitive and affective levels is given in Tables XX and XXI. The former of these tables shows that the objectives presented to teachers cover all cognitive levels and all affective levels except the second. Only two respondents added objectives, four in all, and none of these is related to affective level 2. This fact, in conjunction with the further consideration that all but one of the objectives presented to teachers were judged appropriate by a clear majority of respondents led to the conclusion that the respondents found the list of objectives both realistic and comprehensive. As shown in column C of Table XX, fifteen of the twenty objectives were judged appropriate by more than eighty-five per cent of respondents, and eleven of them by at least ninety-six per cent.

Table XX.-

Classification of Geography Objectives and Percentages of Respondents Finding Objectives Appropriate, Including Them in Teaching Programs, and Evaluating Related Student Performance.

A	B	C	D	E
		Percentages of Respondents Who:		
Objective No.	Classification	found objec. appropriate	included objec.	evaluated performance
1	C 1	100	83	71
2	C 2	96	75	58
3	C 2	87	75	42
4	C 2	100	96	75
5	C 3	100	71	33
6	C 2	100	92	75
7	C 4	92	71	42
8	C 6	100	75	58
9	C 5	87	83	29
10	C 3	75	50	17
11	C 3	62.5	29	12.5
12	C 5	92	67	25
13	C 3	96	79	58
14	C 5	96	75	71
15	A 5	62.5	54	8
16	A 5	96	58	12.5
17	A 1	96	62.5	4
18	A 3	100	75	29
19	A 3	58	17	0
20	A 4	71	29	4

Number of Respondents: 24
C: Cognitive level.
A: Affective level.

Table XXI.-

Classifiction of Objectives Added by Respondents. (Geography)

Objective No.	Classification	Respondent	
1	C 4	S 13	R 1
2	C 5	S 13	R 1
3	A 2	S 13	R 1
4	A 1	S 11	R 1

S: School.
R: Respondent.
C: Cognitive level.
A: Affective level.

While all objectives except one were judged appropriate by a clear majority, only fourteen of the twenty were included in teaching programs by a clear majority of respondents. Table XXII shows that these objectives correspond to the six cognitive levels, and the first and third affective levels.

The percentage differences between those judging objectives appropriate and those including them in teaching programs are shown graphically in Figure 9 and can also be seen through a comparison between columns C and D in Table XX. It is clear that only in four cases, objectives 4, 6, 9, and 15, representing cognitive levels 2 and 5, and affective level 5, are the differences relatively close. While it is true that the differences are greatest for the objectives classified as affective, differences of more than twenty per cent are associated with eight of the cognitive objectives.

Details of the six objectives included by less than a clear majority of respondents are given in Table XXIII. Three of these, numbers 10, 11, and 19, are of the same taxonomic levels as objectives 5, 13, and 18 which, as shown in Table XXII, were included by over seventy per cent of respondents. However, the last three objectives in Table XXIII, corresponding to affective levels 4 and 5, are the only examples of these two levels. In effect this means that affective levels 2, 4, and 5 are not represented by any of the objectives included in teaching programs by a clear majority of respondents.

Table XXII.-

Classification of the Objectives Included in Teaching Programs by a Clear Majority of Respondents. (Geography)

Objective No.	Classification	Percentage Including Objective
1	C 1	83
2	C 2	75
3	C 2	75
4	C 2	96
6	C 2	92
5	C 3	71
13	C 3	79
7	C 4	71
9	C 5	83
12	C 5	67
14	C 5	75
8	C 6	75
17	A 1	62.5
18	A 3	75

C: Cognitive level.
A: Affective level.

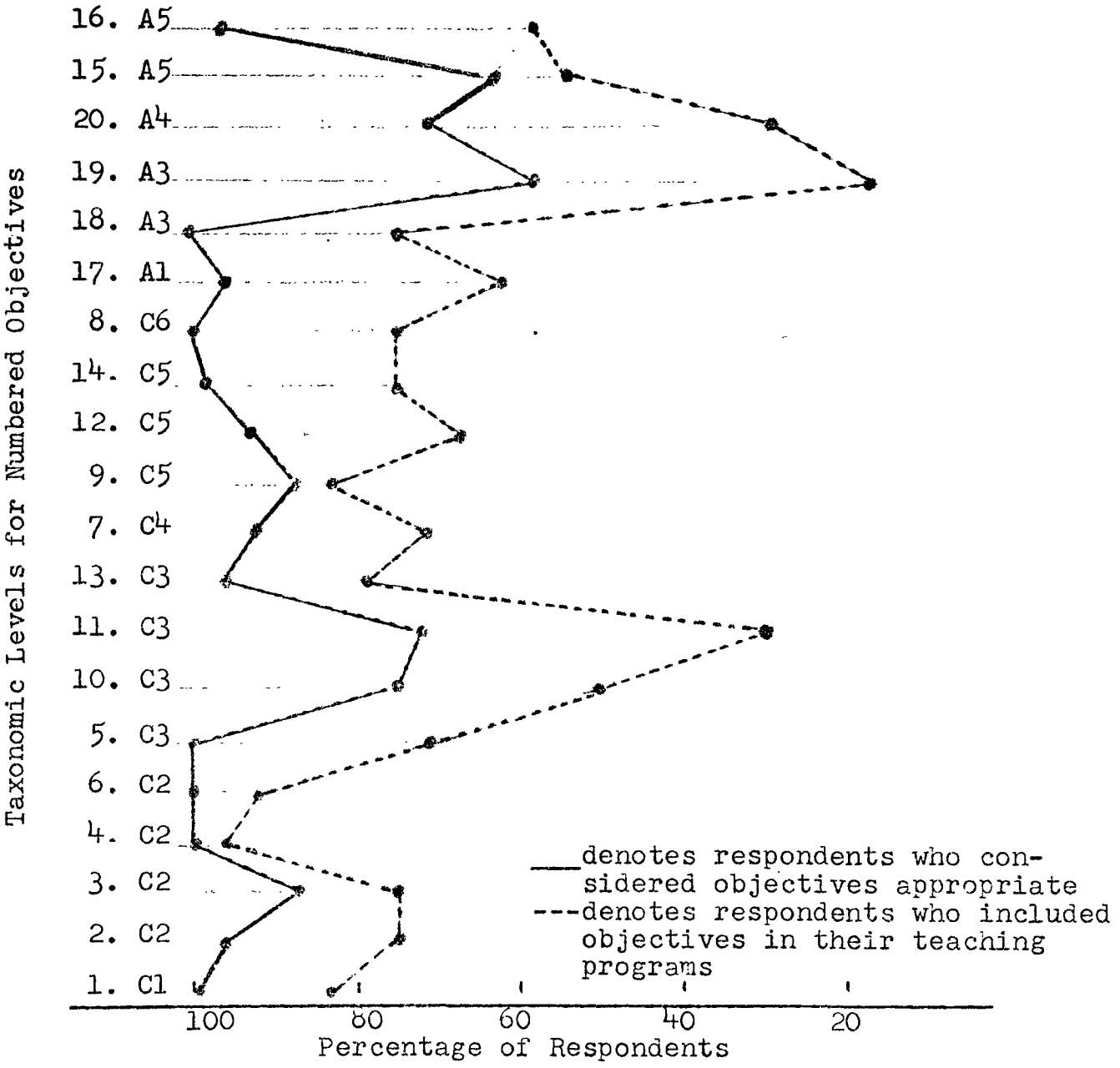

Figure 9.- Differences between Percentages of Geography Teacher Respondents who considered Objectives Appropriate to their Course and Percentages of Respondents who included Objectives in their Teaching Programs.

Table XXIII.-

Classification of the Objectives Included in Teaching Programs by Less than a Clear Majority of Respondents. (Geography)

Objective No.	Classification	Percentage Including Objective
10	C 3	50 (75)[a]
11	C 3	29 (62.5)
19	A 3	17 (58)
20	A 4	29 (71)
15	A 5	54 (62.5)
16	A 5	58 (96)

C: Cognitive level.
A: Affective level.
a Percentages of respondents who considered the objectives appropriate to the course they were teaching.

More significance, however, is attached to the objectives for which a clear majority of respondents had some definite method of directly evaluating related student behavior. Table XXIV shows that these objectives correspond only to cognitive levels 1, 2, and five, and draws attention to the differences between the proportions of respondents including these objectives in their teaching programs and the proportions that evaluated related student performance. Table XXV gives similar information for the other objectives, while Figure 10, graphically summarizing Tables XXIV and XXV, shows that only a minority of the respondents evaluated learning outcomes associated with thirteen of the twenty listed objectives, also that the neglect of evaluation is most pronounced with regard to affective outcomes, and finally, that the differences between the percentages including objectives and those evaluating related behavior are greater than twenty per cent in the majority of cases. A notable aspect is that in a subject such as geography, the application level, represented by objectives 13, 5, 10, and 11, was operationalized by relatively small proportions of respondents.

The foregoing analysis of the responses of grade twelve teachers of geography can now be related directly to the first two of the four propositions basic to the present research. Six objectives, corresponding to cognitive levels 1, 2, 3,

Table XXIV.-

Classification of the Objectives for Which a Clear Majority of Respondents Evaluated Student Performance (Geography)

Objective No.	Classification	Percentage Evaluating Performance	
1	C 1	71	(83)[a]
4	C 2	75	(96)
6	C 2	75	(92)
14	C 5	71	(75)

C: Cognitive level.

a Percentage of respondents who included the objectives in their teaching programs.

Table XXV.-

Objectives for Which Less than a Clear Majority of Respondents Evaluated Student Performance (Geography).

A Performance Evaluated by 40 - 60 Per Cent of Respondents			B Performance Evaluated by 20 - 40 Per Cent of Respondents			C Performance Evaluated by Less Than 20 Per Cent of Respondents		
No. of Objective	Classification	a / b	No. of Objective	Classification	a / b	No. of Objective	Classification	a / b
2	C 2	75 / 58	5	C 3	71 / 33	10	C 3	50 / 17
3	C 2	75 / 42	9	C 5	83 / 29	11	C 3	29 / 12.5
13	C 3	79 / 58	12	C 5	67 / 25	17	A 1	62.5 / 4
7	C 4	71 / 42	18	A 3	75 / 29	19	A 3	17 / 0
8	C 6	75 / 58				20	A 4	29 / 4
						15	A 5	54 / 8
						16	A 5	58 / 12.5

C: Cognitive level.
A: Affective level.
a: Percentage of respondents who included the objective in their teaching program.
b: Percentage of respondents who evaluated student performance in relation to objective.

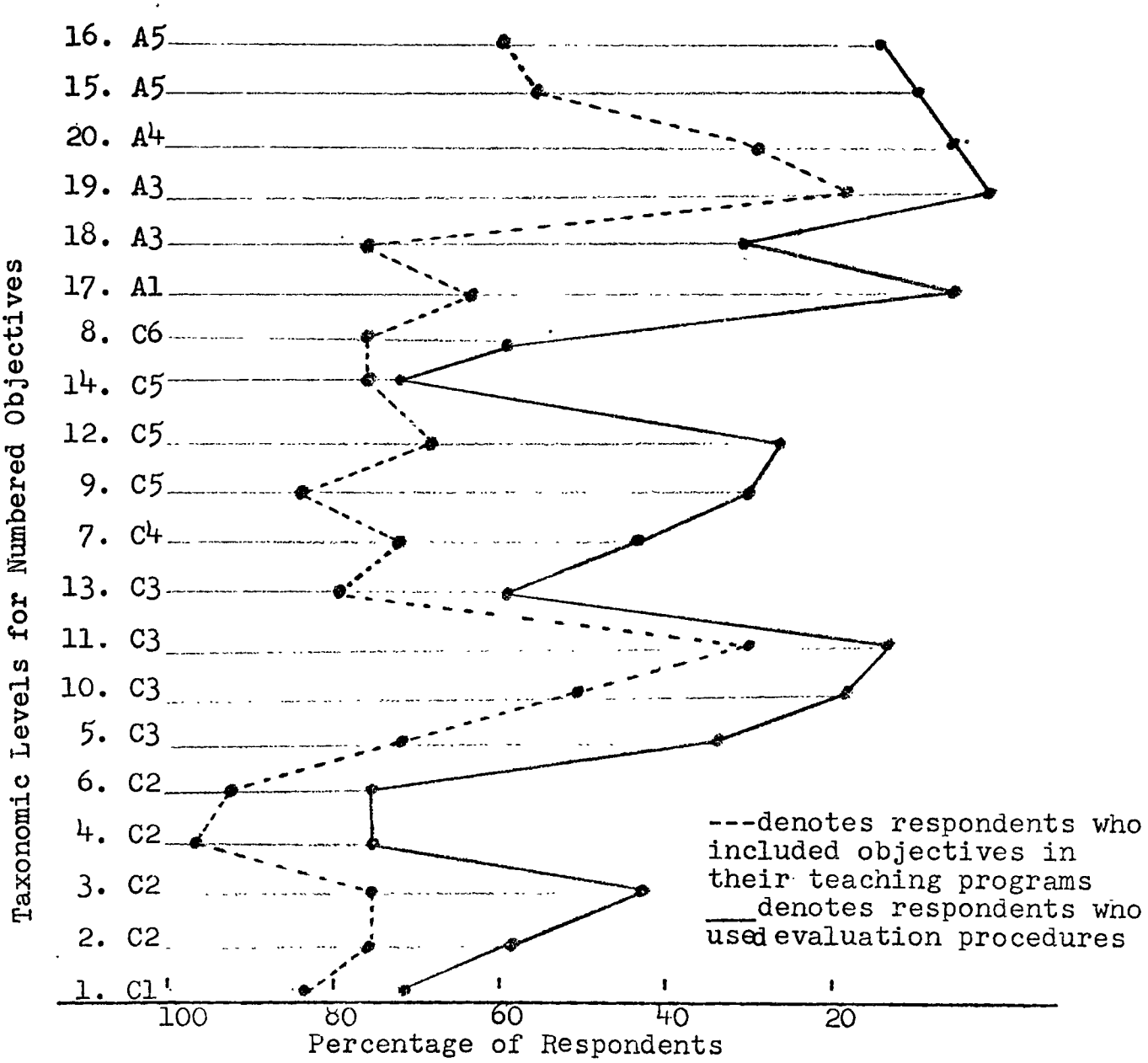

Figure 10.- Differences between the Percentages of Geography Teacher Respondents who included Objectives in Their Teaching Programs and Percentages of Respondents who used Evaluation Procedures for Assessing Related Student Performance.

and 6, and affective level 3, were judged appropriate by all respondents, while five other objectives, corresponding to cognitive levels 2, 3, and 5, and affective levels 1 and 5, were considered appropriate by ninety-six per cent of the respondents. All objectives except one were judged appropriate by a clear majority of respondents, these objectives covering all cognitive levels, and affective levels 1, 3, 4, and 5. The objectives included by a clear majority of respondents correspond to all cognitive levels and to the first and third affective levels. In only four cases, with regard to objectives corresponding to cognitive levels 1, 2, and 5, did a clear majority of respondents evaluate behavior related to the objectives. Evaluation of affective outcomes was shown to be rare. It can be concluded that the only outcomes operationalized by a clear majority of the respondents are those related to knowledge, comprehension and synthesis behavior.

(e) History.- The responses of the teachers of grade twelve history, and the objectives added by respondents are analyzed in Tables XXVI and XXVII. The former of these tables shows that the objectives presented to teachers, corresponding to all the cognitive and all the affective levels, were judged appropriate in all cases except objective 19 by a clear majority of respondents and more than half the objectives were

Table XXVI.-

Classification of History Objectives and Percentages of Respondents Finding Objectives Appropriate, Including Them in Teaching Programs, and Evaluating Related Student Performance.

A	B	C	D	E
		Percentages of Respondents Who:		
Objective No.	Classification	found objec. appropriate	included objec.	evaluated performance
1	C 1	88	79	73
2	C 2	91	82	54.5
3	C 2	97	91	67
4	C 3	79	67	39
5	C 3	91	76	45
6	C 2	91	70	30
7	C 4	85	54.5	30
8	C 6	97	79	45
9	C 5	85	64	36
10	C 3	64	39	12
11	C 3	97	82	51.5
12	C 5	91	73	64
13	C 3	94	82	64
14	C 5	97	88	82
15	A 5	88	61	27
16	A 5	100	82	15
17	A 1	91	64	9
18	A 2	79	48	9
19	A 3	57.5	21	0
20	A 4	82	54.5	12

Number of Respondents: 33.
C: Cognitive level.
A: Affective level.

Table XXVII.-

Classification of Objectives Added by Respondents. (History)

Objective No.	Classification	Respondent
1	C 2	S 1 R 1
2	A 2	S 1 R 1
3	C 5	S 1 R 1
4	A 5	S 1 R 1
5	C 5	S 3 R 1
6	A 4	S 3 R 1
7	A 2	S 4 R 1
8	A 1	S 5 R 3
9	A 3	S 5 R 3
10	C 4	S 5 R 4
11	C 4	S 5 R 4
12	A 4	S 5 R 4
13	A 1	S 5 R 4
14	A 4	S 7 R 1
15	A 1	S 11 R 1
16	A 4	S 11 R 1
17	A 5	S 12 R 1
18	C 5	S 12 R 1
19	C 2	S 12 R 1
20	C 4	S 12 R 1
21	C 2	S 12 R 1
22	A 2	S 13 R 1
23	C 4	S 13 R 1
24	A 4	S 13 R 1
25	C 1	S 13 R 3
26	A 5	S 13 R 3

S: School.
R: Respondent.
C: Cognitive level.
A: Affective level.

so judged by over ninety per cent of respondents. From Table XXVII it is seen that ten respondents added twenty-six objectives in all; these either paraphrase those already listed, or express greater specificity as regards content. It is to be noted that fifteen of the twenty-six objectives added by respondents are related to the affective domain. The over-all conclusion from the considerations made in this paragraph is that most respondents found the list of objectives comprehensive and suitable.

Table XXVIII shows that in fifteen of the twenty cases a clear majority of respondents included the objective in their teaching programs. The objectives included cover all cognitive levels except level 4, and also cover affective levels 1 and 5. Table XXIX shows that the objectives included by less than a clear majority correspond to the cognitive and affective levels which are not represented among the objectives included by a clear majority and detailed in Table XXVIII. It is notable that while four of the five objectives in Table XXIX were judged appropriate by a clear majority of respondents, there was in every case a substantial difference between the proportion of respondents making this judgment and the proportion including the objective in teaching programs. These differences for all objectives are presented graphically in Figure 11, where it can be noted that the smallest differences are found at the low cognitive levels.

Table XXVIII.-

Classification of the Objectives Included in Teaching Programs by a Clear Majority of Respondents. (History)

Objective No.	Classification	Percentage Including Objective
1	C 1	79
2	C 2	82
3	C 2	91
6	C 2	70
4	C 3	67
5	C 3	76
11	C 3	82
13	C 3	82
9	C 5	64
12	C 5	73
14	C 5	88
8	C 6	79
17	A 1	64
15	A 5	61
16	A 5	82

C: Cognitive level.
A: Affective level.

Table XXIX.-

Classification of the Objectives Included in Teaching Programs by Less than a Clear Majority of Respondents. (History)

Objective No.	Classification	Percentage Including Objective
10	C 3	39 (64)[a]
7	C 4	54.5 (85)
18	A 2	48 (79)
19	A 3	21 (57.5)
20	A 4	54.5 (82)

C: Cognitive level.
A: Affective level.
a Percentages of respondents who considered the objectives appropriate to the course they were teaching.

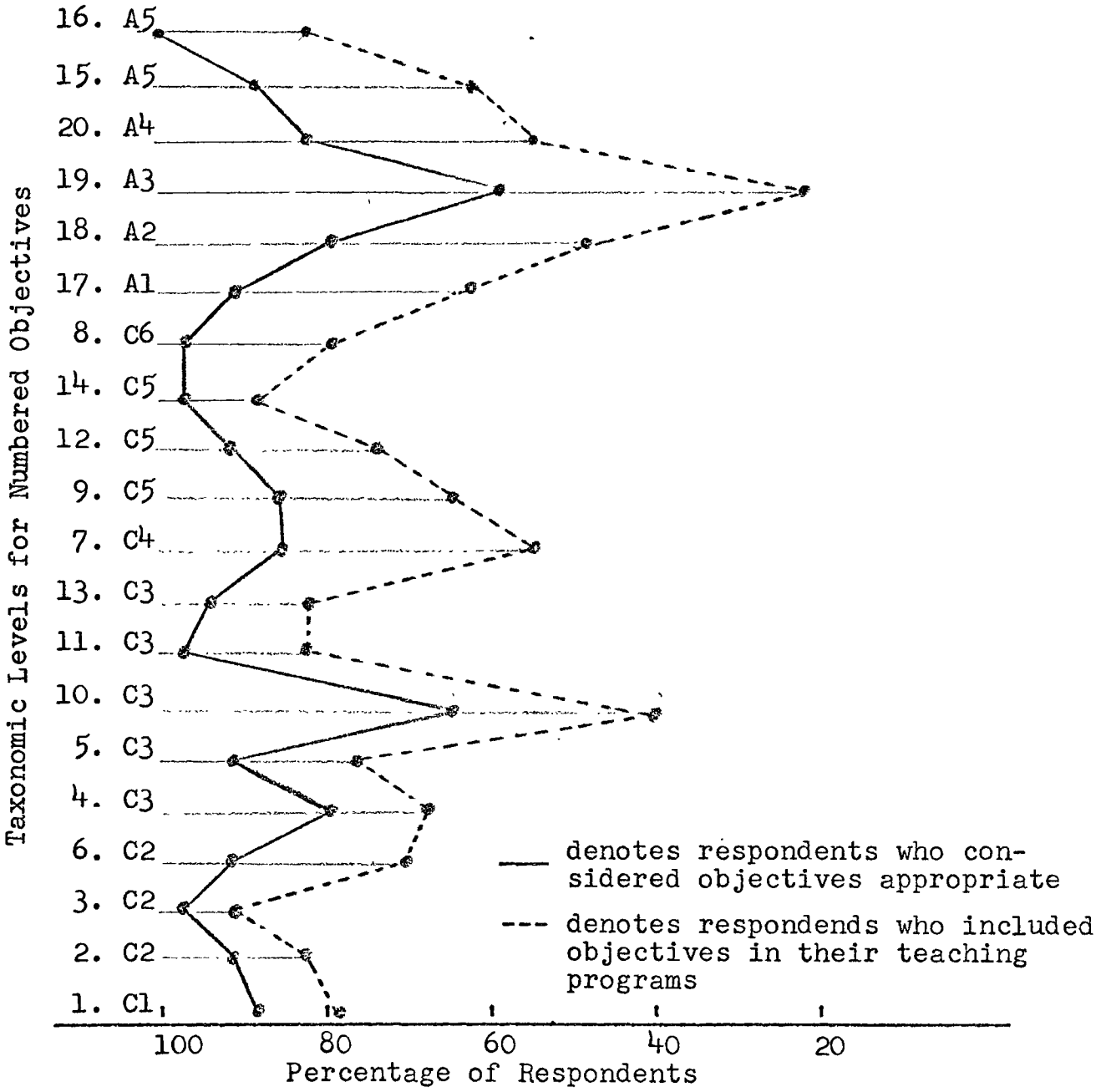

Figure 11.- Differences between Percentages of History Teacher Respondents who considered Objectives Appropriate to their course and Percentages of Respondents who Included Objectives in their Teaching Programs.

When consideration is given to those objectives for which a clear majority of respondents used related evaluation procedures (Table XXX), only five objectives are found to belong to this category, and the five correspond to cognitive levels 1, 2, 3, and 5. It can be seen also that student performance related to these objectives was evaluated by less than seventy per cent of respondents in three of the five cases, and by no more than eighty-two per cent in any case. There was clearly no general consensus among history teacher respondents over what should be evaluated, but a clear majority operationalized knowledge, comprehension and synthesis objectives.

Table XXXI gives details of the fifteen objectives with which less than a clear majority of respondents associated evaluation of related student behavior. It is to be remarked that in most cases evaluation of student behavior was carried out by substantially less than a majority, and in the case of the affective objectives in columns B and C, respondents evaluating behavior constituted less than twenty per cent in all cases but one, and in that case, objective 15, affective level 5, the percentage was only twenty-seven.

The summary of Tables XXX and XXXI presented graphically in Figure 12 shows that only for cognitive levels 1 and 5 is there little difference between the percentage of teachers

Table XXX.-

Classification of the Objectives for Which a Clear Majority of Respondents Evaluated Student Performance. (History)

Objective No.	Classification	Percentage Evaluating Performance	
1	C 1	73	(79)[a]
3	C 2	67	(91)
13	C 3	64	(82)
12	C 5	64	(73)
14	C 5	82	(88)

C: Cognitive level.

a Percentage of Respondents who included the objectives in their teaching programs.

Table XXXI.-

Objectives for Which Less than a Clear Majority of Respondents Evaluated Student Performance (History).

A Performance Evaluated by 40 - 60 Per Cent of Respondents			B Performance Evaluated by 20 - 40 Per Cent of Respondents			C Performance Evaluated by Less Than 20 Per Cent of Respondents		
No. of Objective	Classification		No. of Objective	Classification		No. of Objective	Classification	
	a	b		a	b		a	b
2	C 2		6	C 2		10	C 3	
	82	54.5		70	30		39	12
5	C 3		4	C 3		17	A 1	
	76	45		67	39		64	9
11	C 3		7	C 4		18	A 2	
	82	51.5		54.5	30		48	9
8	C 6		9	C 5		19	A 3	
	79	45		64	36		21	0
			15	A 5		20	A 4	
				61	27		54.5	12
						16	A 5	
							82	15

C: Cognitive level.
A: Affective level.
a: Percentage of respondents who included the objective in their teaching program.
b: Percentage of respondents who evaluated student performance in relation to objective.

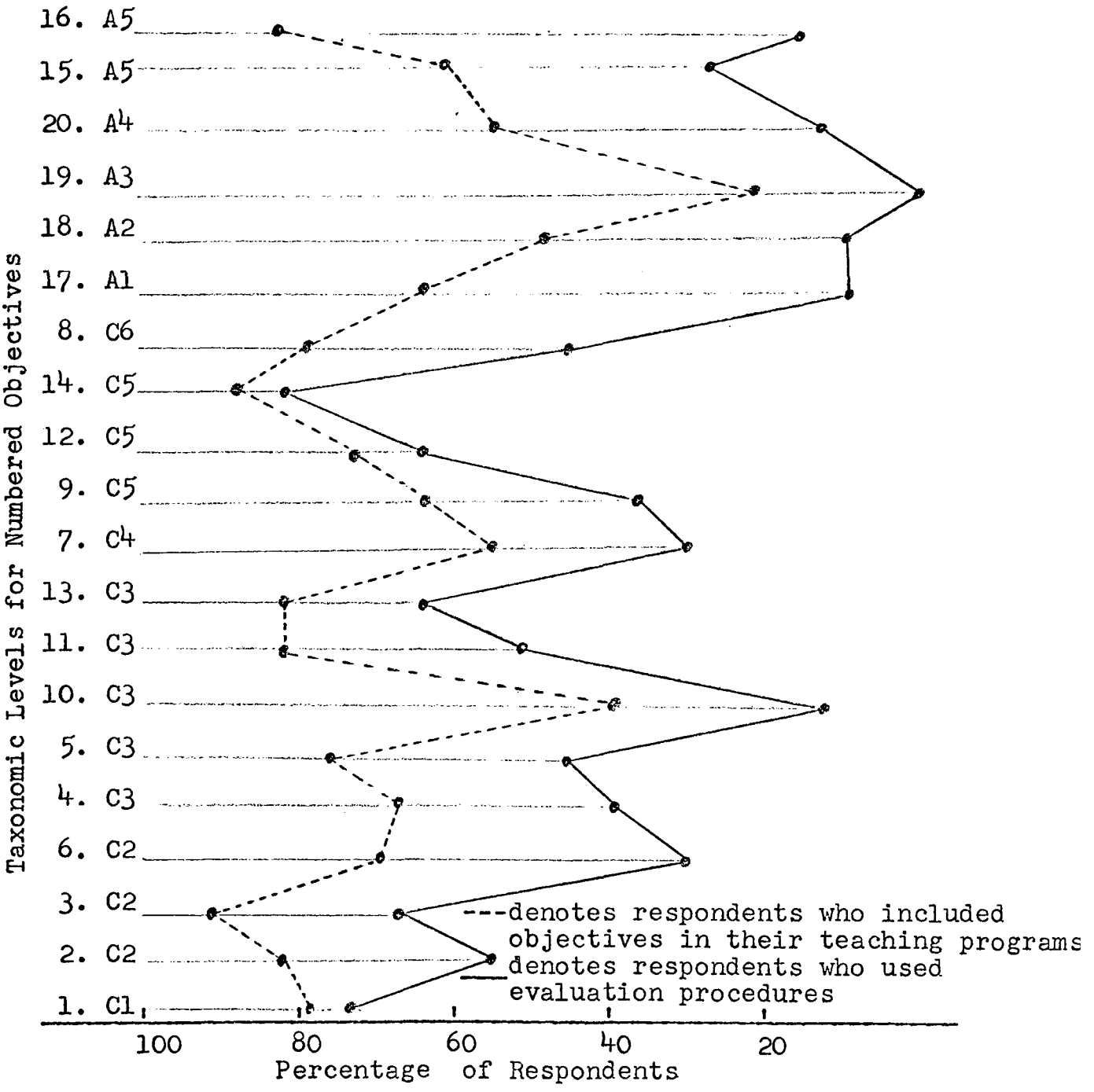

Figure 12.- Differences between the Percentages of History Teacher Respondents who included Objectives in their Teaching Programs and Percentages of Respondents who used Evaluation Procedures for Assessing related Student Performance.

including the objective and percentage evaluating related student behavior. While affective outcomes were evaluated by only a small minority of respondents, the evaluation of student behavior in relation to most types of educational outcomes was not characteristic of most respondents.

The foregoing analysis of the responses of grade twelve teachers of history can now be related directly to the first two of the propositions that are basic to the present research. Nineteen of the twenty objectives presented to teachers were considered appropriate by a clear majority, these objectives corresponding to all cognitive levels and all but the fourth affective level. Fifteen of the objectives were included in teaching programs by a clear majority, and these corresponded to all cognitive levels except the fourth, and to two affective levels, the first and the fifth. While a clear majority of respondents had some definite method of directly evaluating student behavior related to five objectives, these represented only cognitive levels 1, 2, 3, and 5. It can be concluded that the only outcomes operationalized by a clear majority of respondents are related to knowledge, comprehension, application and synthesis behavior.

(f) Mathematics.- An analysis of the responses of teachers of grade twelve mathematics along with the classification of the objectives into cognitive and affective levels is

presented in Table XXXII. Objectives added by respondents are analyzed in Table XXXIII. It can be seen from the former table that the objectives presented to teachers represented all cognitive levels, and all affective levels except the fifth. One of the six respondents who added objectives wrote in one of this type; another added an objective related to the first affective level; and the other four respondents added cognitive objectives (Table XXXIII). Twenty-five of the twenty-six objectives were found appropriate by a clear majority of respondents while, as can be seen from column C of Table XXXII, twenty of the objectives were judged appropriate by more than eighty per cent of the respondents. While objective 22, affective level 3, was judged appropriate by only fifty per cent of respondents, three other examples of the same type, numbers 20, 21, and 26 were considered appropriate by a clear majority of respondents. It is concluded that the list of twenty-six objectives was found comprehensive and realistic.

Table XXXIV gives the objectives which were included in teaching programs by a clear majority of respondents, those found in the table representing only the first four cognitive levels. Except for numbers 6 and 13, these objectives were all included by at least seventy-five per cent of respondents. It is clear that most respondents included in their teaching

Table XXXII.-

Classification of Mathematics Objectives and Percentages of Respondents Finding Objectives Appropriate, Including Them in Teaching Programs, and Evaluating Related Student Performance.

A	B	C	D	E
		Percentages of Respondents Who:		
Objective No.	Classification	found objec. appropriate	included objec.	evaluated performance
1	C 1	78	75	55.5
2	C 1	97	97	55.5
3	C 2	97	89	69
4	C 1	97	89	61
5	C 1	100	92	78
6	C 2	94	64	42
7	C 2	94	80.5	64
8	C 2	97	78	53
9	C 2	100	80.5	58
10	C 3	97	92	86
11	C 4	89	58	44
12	C 4	92	47	25
13	C 4	92	67	47
14	C 3	86	53	25
15	C 5	83	50	19
16	C 5	78	55.5	39
17	C 6	80.5	30.5	11
18	C 5	75	44	19
19	A 2	94	53	8
20	A 3	67	25	5.5
21	A 3	89	33	8
22	A 3	50	25	5.5
23	A 4	83	42	8
24	A 1	80.5	33	2.7
25	A 2	92	44	0
26	A 3	78	36	8

Number of Respondents: 36.
C: Cognitive level.
A: Affective level.

Table XXXIII.-

Classification of Objectives Added by Respondents. (Mathematics)

Objective No.	Classification	Respondent	
1	C 5	S 4	R 5
2	C 5	S 4	R 5
3	C 4	S 5	R 4
4	C 3	S 5	R 4
		S 3	R 4
5	A 5	S 6	R 1
6	A 1	S 10	R 3
7	C 3	S 12	R 2
8	C 3	S 12	R 2
9	C 1	S 12	R 2

S: School.
R: Respondent.
C: Cognitive level.
A: Affective level.

Table XXXIV.-

Classification of the Objectives Included in Teaching Programs by a Clear Majority of Respondents. (Mathematics)

Objective No.	Classification	Percentage Including Objective
1	C 1	75
2	C 1	97
4	C 1	89
5	C 1	92
3	C 2	89
6	C 2	64
7	C 2	80.5
8	C 2	78
9	C 2	80.5
10	C 3	92
13	C 4	67

C: Cognitive level.

programs only activities classifiable as knowledge, comprehension and application. The fifteen objectives included by less than a clear majority (Table XXXV) are related to cognitive levels 4 to 6, and to all of those affective levels represented in the objectives presented to teachers. It can be seen that fourteen of the fifteen were judged appropriate by a strong majority of respondents, despite the fact that only a minority included most of the objectives in their teaching programs. The percentage differences between those judging objectives appropriate and those including them in their teaching programs are represented graphically in Figure 13. In general, the differences are smallest for the low cognitive levels, and greatest for the affective levels.

The objectives for which a clear majority of respondents had a definite method of directly evaluating related student behavior are shown in Table XXXVI. These five objectives correspond to only the first three cognitive levels. As is evident from Table XXXVII, for most of the objectives far less than a clear majority of respondents made use of related evaluation procedures. Such procedures were commonly associated with the objectives analyzed in column A of Table XXXVII, these corresponding to the first four cognitive levels. Objectives classifiable into cognitive levels 5 and 6 or into any of the affective levels are all found in column C of the same table,

Table XXXV.-

Classification of the Objectives Included in Teaching Programs by Less than a Clear Majority of Respondents. (Mathematics)

Objective No.	Classification	Percentage Including Objective
14	C 3	53 (86)[a]
11	C 4	58 (89)
12	C 4	47 (92)
15	C 5	50 (83)
16	C 5	55.5 (78)
18	C 5	44 (75)
17	C 6	30.5 (80.5)
24	A 1	33 (80.5)
19	A 2	53 (94)
25	A 2	44 (92)
20	A 3	25 (67)
21	A 3	33 (89)
22	A 3	25 (50)
26	A 3	36 (78)
23	A 4	42 (83)

C: Cognitive level.
A: Affective level.
a Percentages of respondents who considered the objectives appropriate to the course they were teaching.

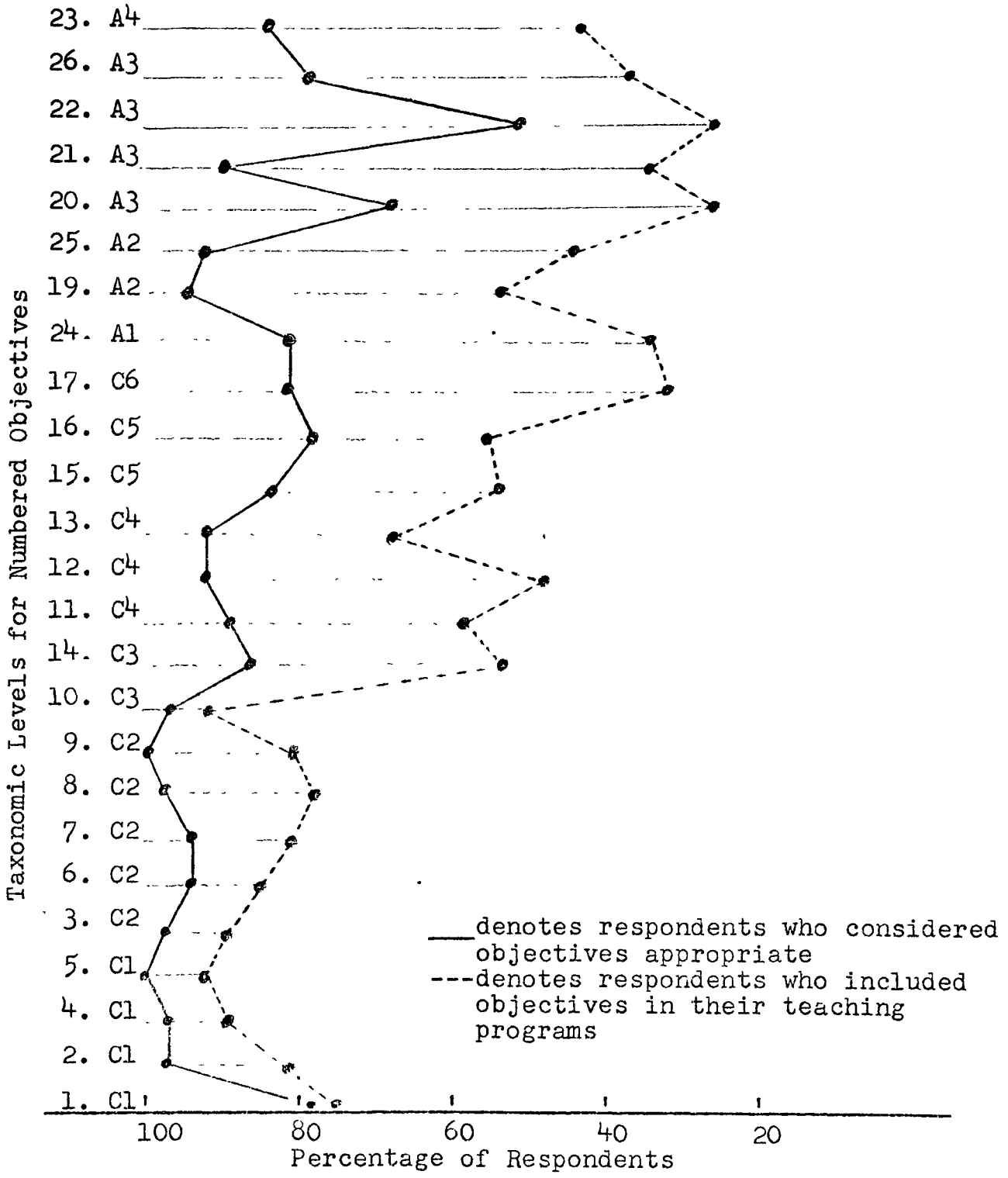

Figure 13.- Differences between Percentages of Mathematics Teacher Respondents who considered Objectives Appropriate to their course and Percentages of Respondents who Included Objectives in their Teaching Programs.

Table XXXVI.-

Classification of the Objectives for Which a Clear Majority of Respondents Evaluated Student Performance. (Mathematics)

Objective No.	Classification	Percentage Evaluating Performance	
4	C 1	61	(89)[a]
5	C 1	78	(92)
3	C 2	69	(89)
7	C 2	64	(80.5)
10	C 3	86	(92)

C: Cognitive level.

a Percentage of respondents who included the objectives in their teaching programs.

Table XXXVII.-

Objectives for Which Less than a Clear Majority of Respondents Evaluated Student Performance (Mathematics).

A Performance Evaluated by 40 - 60 Per Cent of Respondents			B Performance Evaluated by 20 - 40 Per Cent of Respondents			C Performance Evaluated by Less Than 20 Per Cent of Respondents		
No. of Objective	Classification	a b	No. of Objective	Classification	a b	No. of Objective	Classification	a b
1	C 1	75 55.5	14	C 3	53 25	15	C 5	50 19
2	C 1	97 55.5	12	C 4	47 25	18	C 5	44 19
6	C 2	64 42	16	C 5	55.5 39	17	C 6	30.5 11
8	C 2	78 53				24	A 1	33 2.7
9	C 2	80.5 58				19	A 2	53 8
11	C 4	58 44				25	A 2	44 0
13	C 4	67 47				20	A 3	25 5.5
						21	A 3	33 8
						22	A 3	25 5.5
						26	A 3	36 8
						23	A 4	42 8

C: Cognitive level.
A: Affective level.
a: Percentage of respondents who included the objective in their teaching program.
b: Percentage of respondents who evaluated student performance in relation to objective.

indicating that only a small minority of respondents evaluated behavior related to these objectives. Figure 14 shows graphically the differences between the proportions of respondents including objectives in their teaching programs, and the proportions evaluating related student performance. Only with regard to the third cognitive level (objective 10) is the difference small, while differences are most marked at the affective level. It seems that respondents operationalized primarily outcomes associated with application, and then those associated with knowledge and comprehension.

The foregoing analysis of the responses of teachers of mathematics can now be related directly to the first two of the propositions that are basic to the present research. Twenty-five of the twenty-six objectives were found appropriate by a clear majority of respondents, the twenty-five representing all cognitive levels and four of the affective levels. Eleven objectives were included in teaching programs by a clear majority of respondents, the eleven covering cognitive levels 1 through 4. A clear majority of respondents had related evaluation procedures for five objectives, representing the first three cognitive levels. It is concluded that the objectives operationalized by a clear majority of mathematics teacher respondents were restricted to the knowledge, comprehension and application levels.

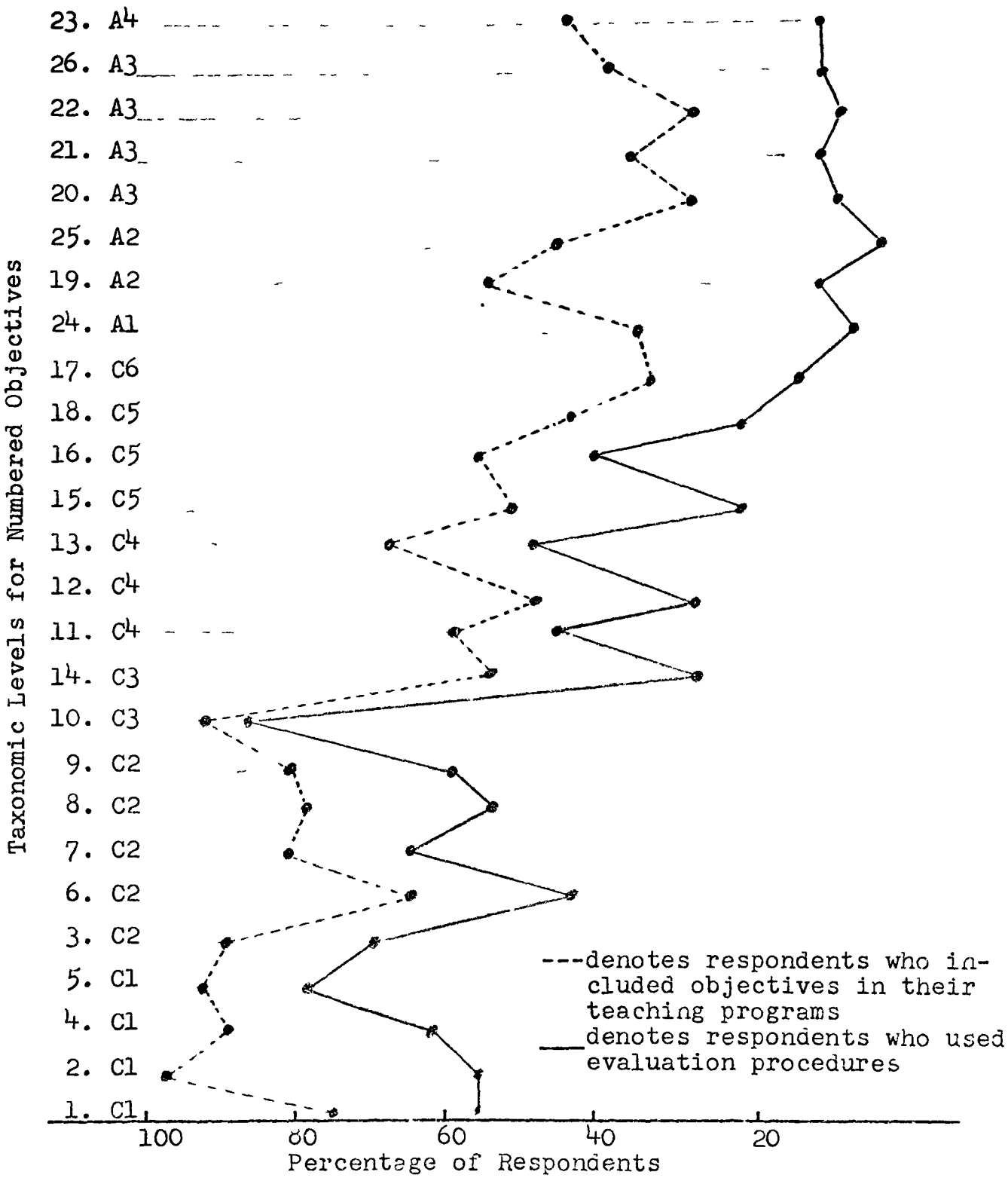

Figure 14.- Differences between Percentages of Mathematics Teacher Respondents who included Objectives in their Teaching Programs and Percentages of Respondents who used Evaluation Procedures for Assessing Related Student Performance.

The foregoing subsections have presented an analysis of the data in relation to the first two of the propositions basic to the research, each subsection concentrating on one of the principal teaching subjects. In the next section of the chapter, the data from the six subjects taken as a whole are analyzed with reference to the third proposition.

2. Analysis of the Data in Relation to Proposition Three.

The third of the propositions on which this study is based states that the:

> instructional objectives being aimed at by a clear majority of the grade twelve teachers of all of the six principal teaching subjects taken as a whole are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

The critical phrase in this proposition is found in the words <u>being aimed at</u>, which is interpreted in three ways in the following paragraphs. First, there is an examination of the correspondence between the eleven taxonomic levels and the objectives judged appropriate by a clear majority of the respondents for all teaching subjects; then the correspondence between the eleven levels and the objectives included in teaching programs is examined; finally, attention is directed to the correspondence between the behavior levels and the objectives with which a clear majority of respondents associated procedures for evaluating related student performance.

If the objectives judged appropriate by a clear majority of the respondents from all of the six teaching groups are classified into cognitive and affective levels, it is evident, as shown in Figure 15, that all cognitive and all affective levels are represented.

When attention is turned to the objectives included in teaching programs by a clear majority from all of the groups, it can be seen from Figure 16 that these also are classifiable into all cognitive and all affective levels.

Three observations seem apposite to the information conveyed by Figure 16. The first is that history is the only subject for which a clear majority of respondents included fifth level affective objectives. Second, the complete range of educational outcomes envisaged in the present research was represented in the programs of a clear majority of the teachers who provided data. Finally, there is no subject for which a clear majority of respondents had teaching programs encompassing a fully comprehensive range of educational outcomes.

Considering those objectives for which a clear majority from all groups had related evaluation procedures, Figure 17 shows these objectives as classifiable into all six cognitive levels, but none of the objectives corresponds to any affective level. In effect this means that the objectives operationalized by a clear majority of the respondents are restricted to

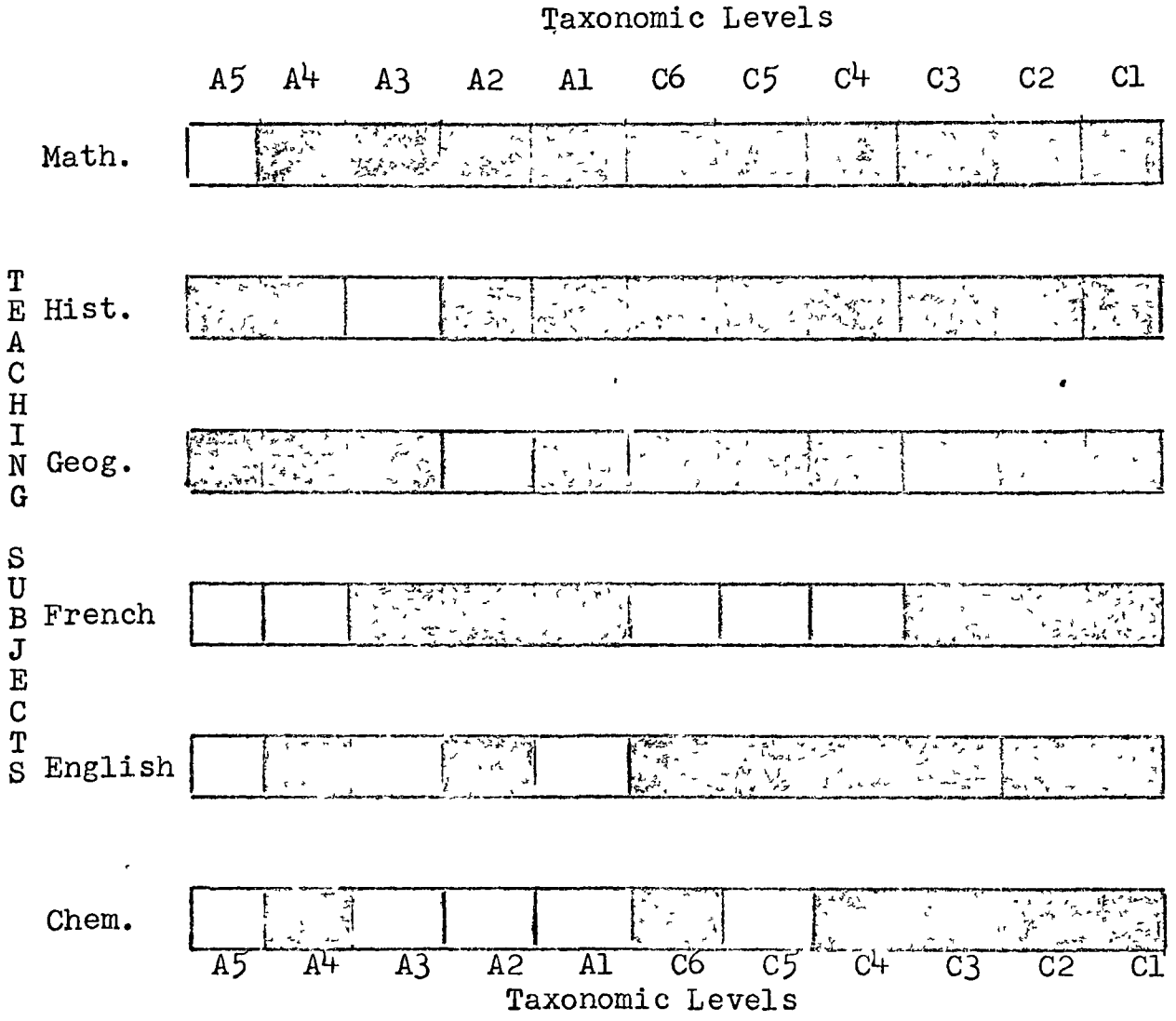

Figure 15.- Cognitive and Affective Levels corresponding to the Objectives judged Appropriate by a Clear Majority of Respondents in the Six Principal Teaching Subjects.

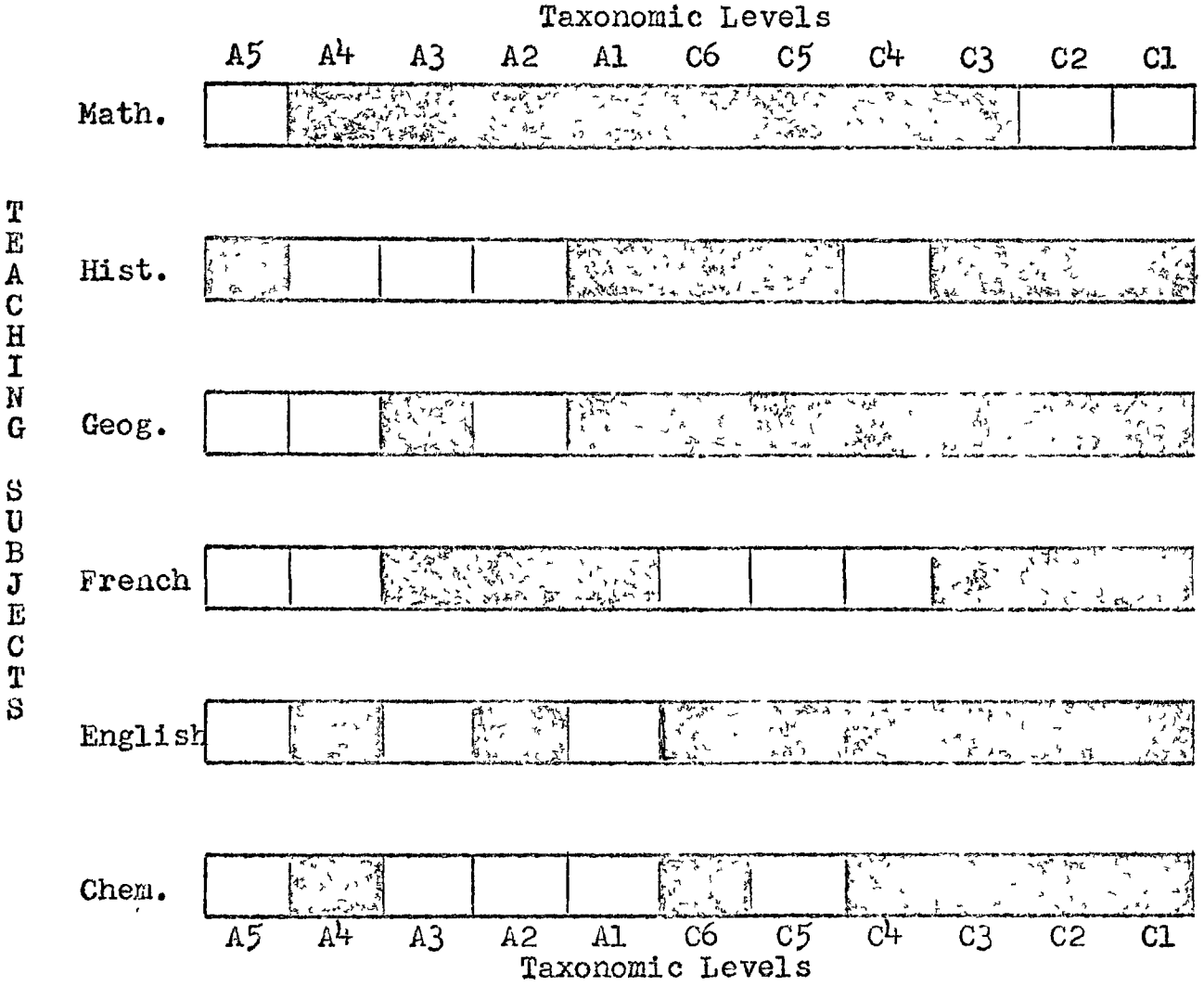

Figure 16.- Cognitive and Affective Levels corresponding to the Objectives included in Teaching Programs by a Clear Majority of Respondents in the Six Principal Teaching Subjects.

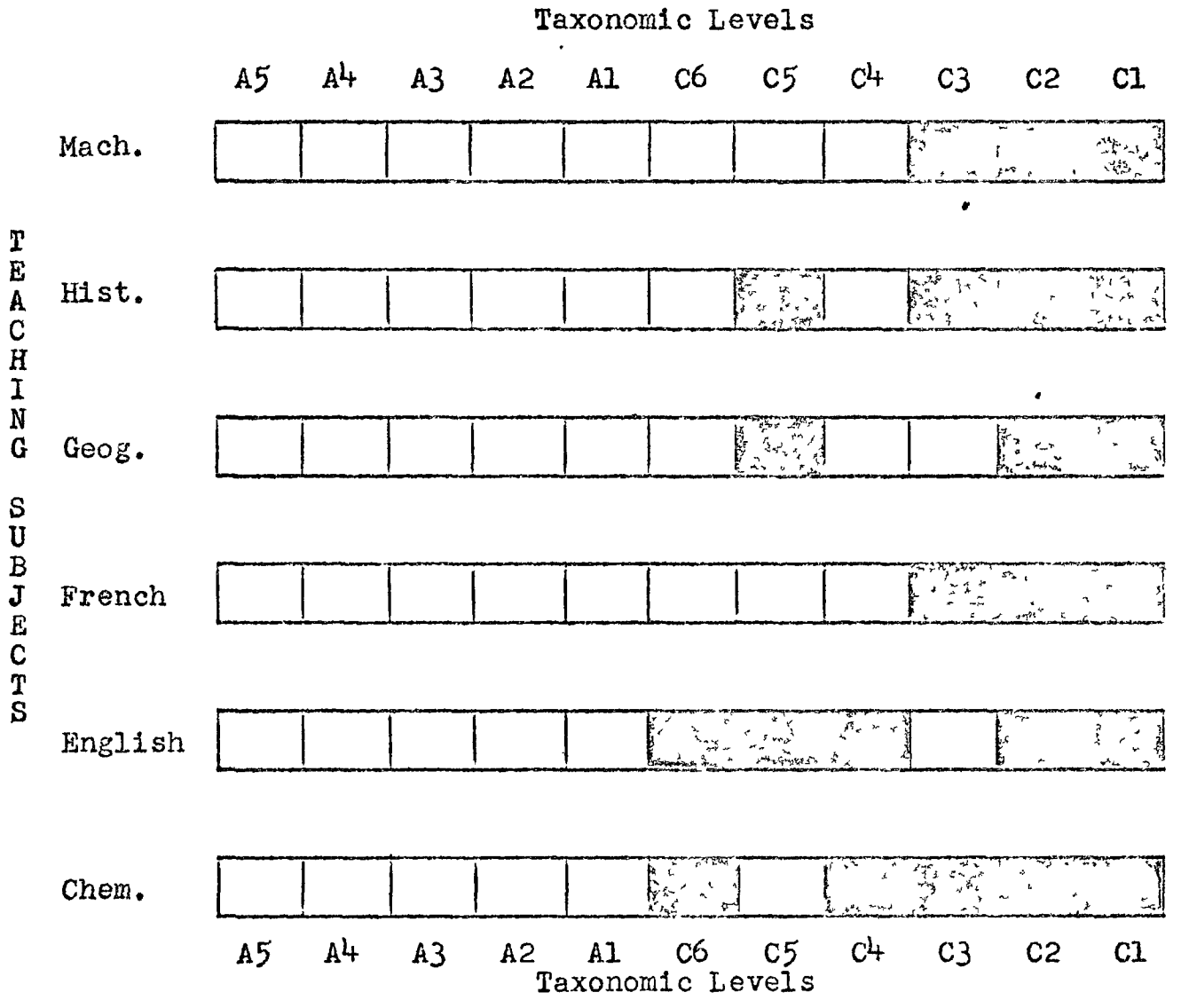

Figure 17.- Cognitive and Affective Levels corresponding to the Objectives for which related Evaluation Procedures were used by a Clear Majority of Respondents in the Six Principal Teaching Subjects.

the six levels of the cognitive domain. It is to be noted, finally, that for no subject did a clear majority of respondents have evaluation procedures related to a fully comprehensive range of even cognitive outcomes.

This section has given an analysis of the data with reference to the third of the propositions on which the study is based. The significance of the situations revealed in the analyses that comprise this third chapter of the report is discussed in detail in chapter four.

CHAPTER IV

DISCUSSION OF DATA

This chapter presents a discussion of the data in relation to each of the propositions, offers considerations based on an over-all review of the data, and concludes with recommendations for action suggested by the discussion and considerations contained in the main sections of the chapter.

1. Discussion of the Data in Relation to Proposition One.

The first proposition states that the instructional objectives judged appropriate by a clear majority of grade twelve teachers of each of the six principal teaching subjects correspond closely to the objectives included in their teaching programs, and to those regarding which they evaluate related student performance. As shown in the previous chapter, it was found that most of the objectives presented to each group of teachers were judged appropriate by a substantial majority of respondents, the majority generally comprising a proportion considerably higher than the sixty per cent accepted in this study as constituting a clear majority. Without being fully comprehensive with regard to the eleven cognitive and affective levels used for classification purposes in the study, the objectives judged appropriate were found in all subjects except

French to be reasonably comprehensive in this regard. The same kind of observation, however, cannot be made about the objectives included in teaching programs by a clear majority of each group of respondents, and proves even less accurate in reference to those objectives with which a clear majority of respondents associated definite evaluation procedures. In fact, as Figures 4 through 15 clearly show, there are often very marked differences among the proportions of respondents judging an objective appropriate, including it in teaching programs, and evaluating related student performance.

A difference between the proportion of teachers judging an objective appropriate to their course and the proportion including that objective in their teaching programs would probably cause little surprise to practising teachers. Most teachers would be well aware of the point raised by Scott and Cassin,[1] that teaching behavior is coerced by the multi-faceted nature of the whole teaching-learning context. Not everything that the teacher would like to do will prove practicable within the exigencies of a given situation. Nevertheless, when desirable types of learning outcomes fail to gain inclusion in the programs of teachers favorably disposed toward

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1 Edward Scott and Edward Cassin, "Teacher Direction of Pupil Activity," Administrator's Bulletin, Department of Education, University of Queensland, Australia, Vol. 2, No. 5, July 1971, p. 1.

them, it is a clear responsibility of school authorities to investigate the causes of this situation and to take steps to remove them. Details of the types of learning outcomes referred to in this section are given in Table XXXVIII, special attention being drawn to the cases of chemistry, history and especially mathematics, where it would be difficult to resist the judgment that the omissions have effected a major distortion of the kinds of teaching programs that the respondents judged desirable.

If the principle is accepted that one can be sure of having taught only the behavior which has subsequently been evaluated, differences between the proportion including an objective in their teaching programs and the proportion evaluating related student performance must be considered more serious than the differences discussed in the previous paragraph. The degree of seriousness is all the more marked if it is found, as is the case in this study, that irrespective of the range of learning outcomes envisaged by a teaching program, the outcomes actually evaluated, and therefore operationalized, are largely restricted to low cognitive levels. In the interests of promoting the broadest possible range of appropriate types of learning outcomes, educational authorities should investigate the causes of and the remedies for the narrow range of operationalization demonstrated in chapter

Table XXXVIII.-

Types of Intended Learning Outcomes Judged Appropriate, but not Included in Teaching Programs by a Clear Majority of Respondents for Each of the Six Principal Teaching Subjects.

Kinds of Learning Outcomes	Principal Teaching Subjects					
	Chem	Eng	Fren	Geog	Hist	Math
Knowledge C 1						
Comprehension C 2						
Application C 3						
Analysis C 4					X	
Synthesis C 5	X					X
Evaluation C 6						X
Receiving A 1	X					X
Responding A 2	X				X	X
Valuing A 3	X	X				X
Organ. of Values A 4				X	X	X
Characterization by Values A 5				X		

C: Cognitive level. A: Affective level.
X: relates the outcome which was not included with the appropriate teaching subject.

three of the present study. It would seem particularly important to determine if the situation reflects teacher belief that the most important learning outcomes are related to the low cognitive levels, or whether it arises from lack of teacher knowledge, capability or confidence with regard to the methods of operationalizing higher cognitive and all affective levels of student behavior. Table XXXIX gives details of the kind of learning outcomes included in teaching programs but not evaluated by a clear majority of respondents. Given that in most cases the teaching programs already constitute a truncated version of what respondents judged desirable, it must be conceded that the learning behaviors operationalized in all six subjects represent an extremely limited concept of what an appropriate program should be.

The foregoing section has presented a discussion of the data in relation to proposition one. Important questions have been raised as to whether respondents gave mere lip service to learning behavior going beyond that classifiable as low-level cognitive; whether they did not know how to operationalize higher level behavior; or whether they were compelled by unspecified influences to confine operationalized outcomes within a narrow range. The next section gives more specific application of such questions to each of the principal teaching subjects in turn.

Table XXXIX.-

Types of Intended Learning Outcomes Included in Teaching Programs but not Evaluated by a Clear Majority of Respondents for Each of the Principal Teaching Subjects.

Kinds of Learning Outcomes	Principal Teaching Subjects					
	Chem	Eng	Fren	Geog	Hist	Math
Knowledge C 1						
Comprehension C 2						
Application C 3		X		X		
Analysis C 4				X		X
Synthesis C 5						
Evaluation C 6				X	X	
Receiving A 1			X	X	X	
Responding A 2		X	X			
Valuing A 3			X	X		
Organ. of Values A 4	X	X				
Characterization by Values A 5					X	

C: Cognitive level. A: Affective level.
X: relates the outcome which was not evaluated with the appropriate teaching subject.

2. Discussion of the Data in Relation to Proposition Two.

The second proposition states that the instructional objectives being aimed at by a clear majority of the grade twelve teachers of each of the principal teaching subjects are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior. The sub-sections that now follow briefly consider the data relevant to each of the six subjects, the particular purpose being to show the extent to which the kinds of educational objectives supported by each group of respondents constitute an adequate teaching program, adequate in the sense that the objectives represent a reasonably comprehensive range of kinds of learning behaviors.

(a) Chemistry.- It was shown in the last chapter that at least ninety per cent of chemistry teacher respondents judged appropriate nineteen of the twenty-five objectives presented to them, a clear majority found all twenty-five appropriate, while eighteen of the twenty-five objectives were included in teaching programs by a clear majority. Respondents were shown to be far from a consensus regarding the objectives for which related evaluation procedures were used, learning outcomes evaluated by at least ninety per cent of respondents representing only the first and second cognitive levels, while those evaluated by a clear majority corresponded to only the

first four cognitive levels. The situation depicted in this analysis can be interpreted in terms of the two main approaches being used in the teaching of chemistry at the present time.

According to Sund and Trowbridge,[2] the 1960's have seen a shift in emphasis in high school science courses away from the imparting of factual knowledge and toward the method of inquiry. The major difference is seen to lie in the modern program's insistence on the assessment of the students' inquiry skills as an essential component of adequate evaluation. Among the objectives presented to teachers of chemistry in the present study, numbers 10 through 16 are related to students' inquiry skills. The data from the chemistry teacher respondents suggest that they followed programs which largely neglected the element regarded as an essential component of the modern programs. Of the seven objectives related to inquiry skills four were evaluated by less than thirty per cent of the respondents, and although a clear majority evaluated learning outcomes with regard to the other three objectives, an examination of these shows that they are limited to elementary skills such as accurate observation, communication, and interpretation of data presented in different forms. Moreover, the less elementary

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2 Robert B. Sund and Leslie W. Trowbridge, Teaching Science by Inquiry in the Secondary School, Columbus, Ohio, Charles E. Merrill, 1967, p. 90-91, p. 22-23.

inquiry skills were not evaluated at all by most respondents. It seems that the teaching programs of most respondents were oriented towards the traditional programs which, as Hurd[3] showed, have been strongly criticized in recent years. At least in one important respect the respondents' teaching programs appear to be out of harmony also with the Ontario Department of Education's injunction about "maintaining close contact with new developments in post-secondary education,"[4] and with the same department's strong endorsement of "learning processes based on inquiry and research by the student."[5]

The impression that the respondents' teaching programs were of the traditional type is strengthened by an examination of the ten objectives operationalized by a clear majority of respondents, seven of the objectives corresponding to kinds of learning behavior characterized by Schwab[6] as typical, in their concentration on knowledge and technological applications

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3 Paule de H. Hurd, "Science Education for Changing Times," in Nelson B. Henry (ed.), Rethinking Science Education, 59th Yearbook of the National Society for the Study of Education, Part I, Chicago, Ill., The Society, 1960, p. 34.

4 Ontario Department of Education, Recommendations and Information for Secondary School Organization Leading to Certificates and Diplomas - Circular H.S. 1 1972/73, Toronto, The Department, 1971, p. 4.

5 Ibid., p. 5.

6 Joseph J. Schwab, "The Teaching of Science as Enquiry," in J.J. Schwab and P.F. Brandwein, The Teaching of Science, Cambridge, Mass., Harvard University Press, 1964, p. 21-31.

of the traditional science courses. Typical neither of the modern nor even of the traditional chemistry program is the neglect of the evaluation of students' skill in manipulating laboratory equipment and materials, despite the inclusion of the skill in the teaching programs of over ninety per cent of respondents. Refined methods of measuring performance in this regard are probably not available to most teachers, but adequate measures can be carried out with relative ease.[7]

The comparative disregard of affective outcomes appears to be typical of both the traditional and the modern types of chemistry programs, reflecting what Klopfer described as the "present lack of reliable knowledge and the primitive level of discussion about the affective domain in science education."[8] From Klopfer's treatment of affective outcomes in chemistry, it is clear that while there is a variety of techniques available for measuring attitudes and interests, there is little consensus about either the most appropriate affective outcomes or how to measure them, the respondents in the present study being typical of most chemistry teachers in giving verbal assent to aimed-for or hoped-for attitudes and interests, but

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7 Leo Nedelsky, Science Teaching and Testing, New York, Harcourt, Brace and World, 1965, p. 147-148.

8 Leopold E. Klopfer, "Evaluation of Learning in Science," in B.S. Bloom, J.T. Hastings and G.F. Madaus, Handbook on Formative and Summative Evaluation of Student Learning, New York, McGraw-Hill, 1971, p. 584-587.

doing very little to implement such outcomes.[9] Nevertheless, some degree of operationalization is not only possible, but also desirable and necessary. Affective behaviors represent an area clearly neglected in the teaching programs of the chemistry teacher respondents in this study.

This discussion of the data related to the teaching of chemistry has shown that respondents failed to give due attention to operationalizing laboratory skills, neglected the more important inquiry skills that are considered essential to a modern-type program, and disregarded affective behaviors associated with science learning. The discussion of proposition two continues with reference to the data related to the teaching of English.

(b) English.- An examination of the objectives presented to teachers of English reveals that they fall into two broad divisions: first, oral and written expression skills (numbers 1 through 3), and second, understanding and appreciation of literature. The previous chapter showed with regard to the first division that most teachers included the relevant learning behavior in their teaching programs but, while operationalizing objectives dealing with written expression, they did not evaluate student performance related to

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9 Robert H. Carleton et al., "Improving Secondary School Science," in Henry (ed.), op. cit., p. 152.

improvement of vocabulary or of oral expression. The neglect of the latter two areas is all the more anomalous in view of the almost unanimous judgment that both were appropriate in the course, a judgment generally supported by those concerned in English teaching.[10]

After a detailed analysis of thirty-three documents dealing with content and behaviors in literature, and after examining, in addition, a number of curricular programs, Purves[11] analyzed literary objectives for English teaching into six main areas. These, along with the corresponding objectives from the present study, are as follows: to read broadly (number 23); to understand in depth the literary works covered in class (numbers 4 through 8, 10, 13 through 19); to use critical skill in reading unfamiliar texts (numbers 9 and 21); to respond to literature both affectively and evaluatively (numbers 11, 20, 22, 23, 25); to gain satisfaction from literature (number 24); and to gain insight into the human situation (number 12). The second and third of these groups have been described as representing an academic or analytical approach

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10 Frances Erickson, "What Are We Trying To Do In High School English?," in Dwight L. Burton and John S. Simmons (eds.), Teaching English in Today's High Schools, New York, Holt, Rinehart and Winston, 1966, p. 16.

11 Alan C. Purves, "Evaluation of Learning in Literature," in Bloom et al., op. cit., p. 702.

to the curriculum,[12] whereas the last three, in the opinion of Purves,[13] represented a powerful new trend away from the defects into which the second and third had led the curriculum. He claimed that the second and third areas were bound up with the attitude that it is not as important to find pleasure in literature as to look on it as a serious enterprise from which intellectual skills are developed. Emphasizing that it is unacceptable for the teacher of English to disregard the evaluation of attitudes and interests, Purves insisted that learning outcomes of these kinds are important and "should be treated seriously by teachers, for the success or failure of the teacher is at stake"[14] in this very area. Clark, Klein and Burks[15] supported the emphasis on affective learning, claiming that the academic approach to literature is being superseded by a much healthier orientation designed to lead the student to enjoy literature, develop his taste, and grow in desire to read more widely. It was felt that

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12 James R. Squire and Roger K. Applebee, High School English Instruction Today, The National Study of High School English Programs, New York, Appleton-Century-Crofts, 1968, p. 139-143.

13 Purves, op. cit., p. 703 and 716.

14 Ibid., p. 757.

15 Leonard H. Clark, Raymond L. Klein and John B. Burks, The American Secondary School Curriculum, New York, Macmillan, 1965, p. 200.

whatever other values the study of literature might have, they paled beside the assertion that literature produces a high form of aesthetic pleasure, the study of it enabling the student to move from sensual pleasure to the pleasures of the imagination and the intellect. Purves[16] concluded that the behaviors which are termed attitudinal are extremely important to the English curriculum, and that their measurement is important both for the student and for the curriculum.

Taking the principles enunciated in the preceding paragraphs as a framework within which to set an examination of the responses from teachers of English, one is led to the conclusion that their teaching was not consonant with the powerful new trend spoken of, for the literary objectives operationalized by respondents were confined to those categorized above as having a strong academic orientation.

While opposition to certain kinds of formal examinations in literature is justified,[17] it is claimed that there is little reason for the teacher's failure to carry out formative and summative evaluation designed to guide the student in developing his attitudes and abilities.[18] The

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16 Purves, op. cit., p. 757.

17 Glenys G. Unruh and William M. Alexander, Innovations in Secondary Education, New York, Holt, Rinehart and Winston, 1970, p. 68.

18 Purves, op. cit., p. 761.

responses made for the present research, however, show clearly that apart from learning that can be described as academic, the respondents could have little surety that their teaching was effective in promoting desirable outcomes. While an academic orientation in the English program could presumably be justified, it clearly should not be the sole, or even necessarily the major emphasis, nor does it seem that a tendency to neglect oral communication skills can be justified.[19]

The discussion of the data related to the teaching of English has shown that programs had a strong academic bent, that oral communication skills were relatively neglected, and that a serious deficiency was found in the failure to operationalize learning associated with attitudes and interests, an area considered as an extremely important aspect of literary studies.

(c) French.- In a review of second language learning, Hammerly[20] stated that the present position with regard to instruction in that area emphasizes the introduction of the pupil by means of a foreign language to a new medium of communication and a new culture pattern, progressively adding to his sense of pleasurable achievement. In practice, as

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19 Unruh and Alexander, op. cit., p. 68.

20 Hector Hammerly, "Recent Methods and Trends in Second Language Teaching," The Modern Language Journal, Vol. 55, No. 8, December 1971, p. 499-505.

Rivers[21] pointed out, this approach has involved three elements: first, the acquisition of a set of skills which comprise understanding the spoken word, using it, and reading the foreign language; second, a progressive growth in the understanding of language structure; and third, a gradually expanding and deepening knowledge of the geography, history, social organization, literature and culture of the foreign country. The means used to achieve these ends have developed from the traditional orientation to grammar-translation-reading with heavy cognitive emphasis, to the audio-lingual habit theory with major emphasis on psychomotor behavior, and finally to what promises to be the major approach of the 1970's--a method described as modified audio-lingual, which incorporates features of both earlier methods, focusing chiefly on the development of communicative competence.[22]

Using a table of specifications for second-language instruction along with detailed explanation and examples of second-language teaching objectives, Valette[23] delineated the major features of the three approaches. An examination of

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21 Wilga M. Rivers, Teaching Foreign Language Skills, Chicago, University of Chicago Press, 1968, p. 56-285.

22 Edward D. Allen, "The Foreign Language Teacher as a Learner in the Seventies," The Modern Language Journal, Vol. 55, No. 8, December 1971, p. 499-505.

23 Rebecca H. Valette, "Evaluation of Learning in a Second Language," in Bloom et al., op. cit., p. 815-853.

the objectives operationalized by French teacher respondents in the present study indicates that except in two respects their teaching conformed very closely to the modified audio-lingual approach. The exceptions relate to simple communicative competence, and to skill in discriminating and differentiating among elements. The first of these, highly important in modern language learning,[24] was operationalized by more than half but less than a clear majority of respondents, while the second, also an important skill,[25] was operationalized by less than half the respondents.

It can be concluded, nevertheless, that approximately half the respondents operationalized teaching programs typical of the modified audio-lingual approach that is currently recommended by authorities in the field. Clearly, also, a good proportion of teachers need guidance and assistance in implementing practices designed to give more adequate emphasis to skills related to communicative competence and to discriminating and differentiating among elements.

A final consideration refers to affective objectives. While such objectives are almost unanimously accepted as desirable by all language teachers and it is generally held

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24 Rivers, op. cit., p. 189-194.

25 Ibid., p. 120-121.

that the learning of a foreign language brings many benefits in the affective area, it appears that little is done to verify whether such affective outcomes are realized.[26] The affective objectives included in the present study were judged appropriate in every instance by more than eighty per cent of respondents, but only a small minority evaluated student behavior in relation to these kinds of learning outcomes. It could be argued that in the city of Ottawa especially, it is at least as important to promote appropriate affective outcomes like tolerance and understanding of Francophone people in the community, as it is to foster knowledge and understanding of their language.

The discussion of the data related to the teaching of French has shown that in general the kinds of objectives operationalized were consonant with the currently recommended modified audio-lingual approach. It was seen, however, that the full effectiveness of the program was threatened by the comparative neglect of the skills of communication and discrimination. Moreover, the whole area of affective behavior was not operationalized, thus diminishing the chances that the teaching of French would contribute to tolerance

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26 Mills F. Edgerton, "A Philosophy for the Teacher of Foreign Languages," The Modern Language Journal, Vol. 55, No. 1, January 1971, p. 5-15.

and understanding in the bilingual and bicultural national capital.

(d) Geography and History.- These two subjects are considered in the one section because, belonging as they do to the area of social studies, the same general observations apply to both. Dealing with the sensitive field of human behavior social studies is presumed, as Todd[27] pointed out, to play a large role in influencing beliefs and attitudes. Orlandi[28] showed that in this century social studies has been affected by three major traditions, the liberal arts outlook associated with a strong intellectual bent, the life adjustment tradition concerned with the individual's socialization and his personal characteristics, and the citizenship education tradition with emphasis on the individual's commitment, involvement and action in society. While the last two of these traditions can only with difficulty be associated with a definite set of specific learning goals, Orlandi[29] derived

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27 Lewis Paul Todd, "Afterword: Revising the Social Studies," in The Social Studies and the Social Sciences, American Council of Learned Societies and National Council for the Social Studies, New York, Harcourt, Brace and World, 1962, p. 282-303.

28 Lisanio R. Orlandi, "Evaluation of Learning in Secondary School Social Studies," in Bloom et al., op. cit., p. 449.

29 Ibid., p. 450-451.

from a detailed analysis of relevant curriculum documents a number of definite student outcomes that are the primary responsibility of social studies. These can be summarized as knowledge and comprehension, skills, and attitudes and values, all these areas being represented among the history and geography objectives used in the present study.

The first group of goals, dealing with knowledge and comprehension, provides the basis on which learning is built. While proficiency in the second group, comprising research, critical thinking, and democratic group participation skills, is considered to belong among the primary tasks of social studies, it is critical thinking which is felt to be the central goal.[30] It should be added, however, that many claim to see in the development of attitudes and values the essential nature of the social studies.[31]

The general observations just made can serve as a framework for the discussions that now follow. The data coming from teachers of geography and from teachers of history are examined below with reference to the special emphases proper to each of the sets of goals distinguished by Orlandi.

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30 Maurice P. Hunt and Lawrence E. Metcalf, Teaching High School Social Studies (2nd ed.), New York, Harper and Row, 1968, p. 65-164.

31 Frank J. Estvan, Social Studies in a Changing World, New York, Harcourt, Brace and World, 1968, p. 300-332.

(i) Geography.- Geography teacher respondents showed a large measure of agreement on a broad range of learning behaviors that could appropriately be included in teaching programs, but evaluated student performance only in relation to comprehension and to the presentation and interpretation of material through maps, graphs, tables, and similar means. Although the failure of a clear majority to evaluate the affective behaviors which were included in teaching programs could be explained in terms of the difficulties inherent in the question,[32] the fact that only a minimal number engaged in any evaluation at all of such learning must be regarded as disturbing if it is accepted that the development of attitudes and values is essential in this subject.

While the neglect of affective learning may be explained in part by its inherent difficulties, no such explanation satisfactorily accounts for the anomalous situation presented by the failure of a clear majority of respondents to evaluate student performance with regard to skills described above as among the primary tasks of instruction in geography and as encompassing its central goal. It is clear that teachers considered these to be important aspects of their subject, for high percentages of respondents, in most

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32 James High, Teaching Secondary School Social Studies, New York, John Wiley, 1962, p. 420-421.

cases well over the sixty per cent required for a clear majority, included such outcomes in their teaching programs. Why so few took steps to operationalize such important objectives calls for examination by those whose position it is to ensure adequate instruction.

It seems justifiable to conclude that a subject with potential for rich and varied learning experiences is being taught in a manner that tends to neglect its primary purposes. Consideration is now given to a subject with similar goals to see if in this second social studies subject, history, instruction conformed more closely to the criteria described above.

(ii) History.- The responses of the teachers of history depict a situation similar to that revealed by the data derived from geography teacher respondents. Once more there was substantial agreement, over ninety per cent in more than half the cases, on the appropriateness of a broad range of educational outcomes. Most of these were included in teaching programs by a clear majority of respondents, but the evaluation of related student behavior was confined to a much narrower range of outcomes.

Operationalized objectives were related to knowledge and comprehension with some emphasis on appropriate skills. To a much greater degree than their geography counterparts,

the history respondents made use in practice of group participation and discussion, but only a small minority operationalized the basic critical thinking skills which were described above as the central goal of social studies. With regard to attitudes and values, more than eighty per cent of respondents supported the appropriateness of most of the relevant objectives. Approximately half of these objectives were included in the teaching programs of a clear majority, but evaluation of related behavior was confined to a small minority of respondents. Clearly the teaching of history had serious deficiencies similar to those found in the teaching of geography.

Attention can appropriately be drawn to the responses of both groups of teachers in relation to attitudes and values. In each case respondents were close to unanimity on the appropriateness to their courses of an awareness of and interest in social problems, but far fewer included such outcomes in their teaching programs, while behavior related to social involvement, a central part of social studies according to Foshay,[33] was included by fewer still. One wonders if the dichotomy between theoretical acceptance and practical

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33 Arthur W. Foshay, Curriculum for the Seventies: An Agenda for Invention, Washington, D.C., National Education Association, 1970, p. 54-55.

implementation of attitude and value objectives reflects fear on the part of teachers that activity in these respects would stir up strong opposition and even antagonism from the community.[34] It may be that there is need for a clearer definition of goals in the social studies by authoritative sources, followed by carefully directed procedures designed to help teachers implement such goals. At least it can be concluded from the data available from the present research that the more important outcomes generally associated with history and geography instruction were not getting due emphasis from the teachers providing data for this study.

(e) Mathematics.- The distinct levels of mathematical thinking that should engage the attention of teachers of mathematics have been identified by Avital and Shettleworth[35] as threefold. The first of these, corresponding to the Bloom-Krathwohl taxonomic level of knowledge, is termed recognition and recall. Corresponding to the comprehension and application levels of the taxonomy is activity called algorithmic thinking and generalizing. The third level of mathematical

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34 Edwin Fenton, "Teaching about Values in the Public Schools," in E. Fenton (ed.), Teaching the New Social Studies in Secondary Schools, New York, Holt, Rinehart and Winston, 1966, p. 44-45.

35 Shmuel M. Avital and Sara J. Shettleworth, Objectives for Mathematics Learning, Some Ideas for the Teacher, Bulletin No. 3, 1968, Toronto, Ontario Institute for Studies in Education, 1968, p. 6-7.

activity is referred to as open search, and is said to correspond to analysis and synthesis in the taxonomy. The second level is considered to involve reproductive thinking, the third to demand productive thinking, while evaluation activity is seen as an integral part of both of these levels.

In rather more detail but in very similar vein, Wilson[36] described specifically cognitive behavior in mathematics as spread over a range of progressively more complex activity. The continuum begins with knowledge and performance of simple operations, advances to the demonstration of an understanding of concepts and their relationships, proceeds to the use of concepts in specific previously practised ways, and concludes with the detection of relationships, the finding of patterns, and the organization and use of concepts and operations in a non-practised context. Despite the progression from simple to complex along the continuum, Wilson[37] emphasized that performance at all cognitive levels should be expected from all students, not only because restricting a student to routine computation can prove uninteresting for him, but also because performance at any one level does not necessarily require mastery at a lower level.

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36 James W. Wilson, "Evaluation of Learning in Secondary School Mathematics," in Bloom et al., op. cit., p. 649.

37 Ibid., p. 650.

Going beyond cognitive activity a number of mathematicians, of whom Ruchlis,[38] and Henderson and Van Beck[39] can be taken as representative examples, put emphasis on the relevance to the mathematics class of appreciation, attitudes and social and environmental problems. It is claimed that the teacher of mathematics is in an excellent position to foster involvement in social and environmental problems.[40]

Using the foregoing general considerations as a reference point for an examination of the responses of the teachers of grade twelve mathematics, it becomes evident that a clear majority of the respondents laid major stress on the cognitive behaviors of computation and comprehension, with attention also given to such simple aspects of application as the solving of routine problems. To be precise, the learning outcomes operationalized by a clear majority of the respondents were related to the recall of concepts and generalizations pertinent to a given problem situation, deciding on the operations appropriate to the context, and finally performing

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38 Hy Ruchlis, "Putting Reality into Mathematics," The Mathematics Teacher, Vol. 64, No. 4, April 1971, p. 369-371.

39 George L. Henderson and Mary Van Beck, "Mathematics Educators Must Help Face the Environmental Pollution Challenge," The Mathematics Teacher, Vol. 64, No. 1, January 1971, p. 33-36.

40 Ibid., p. 36.

those operations with simple application items. Application behaviors like determining relationships between two sets of information and analyzing the relevance of data, far from being operationalized, were not even included in their teaching programs by a clear majority of respondents, while the most complex of the cognitive behaviors, requiring a non-routine application of concepts, although judged appropriate to the course by at least seventy-five per cent of respondents, were included in teaching programs by barely half the respondents at best, and evaluated by a very small minority. If the claim is accepted that some performance at all cognitive levels should be expected from all students, it is anomalous that an entire group of behaviors failed even to gain inclusion in the teaching programs of a clear majority of respondents. At the same time, it is noteworthy that the main thrust of mathematics teaching seems to have been towards activities that are currently considered to merit less emphasis.[41]

When consideration is given to affective behaviors it is found that whereas a clear majority of respondents judged these appropriate to their course, a minority included them in teaching programs, and the evaluation of interest, attitude and appreciation in relation to mathematics was minimal.

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[41] Organization for Economic Cooperation and Development, New Thinking in School Mathematics, Paris, OECD Publications, 1961, p. 201.

Teachers involved in the present study seem to have hoped that this sort of outcome would eventuate, but in most cases they took no concrete steps towards that end. While it is conceded that evaluation is much more difficult for affective behavior than for cognitive, Callahan[42] has demonstrated that there is material available of assistance to teachers in this regard, and that the classroom teacher can do something about evaluating affective outcomes of mathematics instruction.

It can be concluded that a clear majority of grade twelve mathematics teacher respondents seemed to restrict instruction to the simpler types of cognitive outcomes, were inclined to neglect behavior related to non-routine problem solving, discovery experiences and creative behavior, and put little stress on the affective learnings related to mathematics.

The preceding sections have presented a discussion of the data in relation to each of the principal teaching subjects. It has become clear that the learning evaluated by most respondents in these subjects represented a truncated version of the kinds of behaviors included in their teaching programs, the teachers for some reason failing to check on the progress made by their students with regard to learning

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42 Walter J. Callahan, "Adolescent Attitudes Toward Mathematics," The Mathematics Teacher, Vol. 64, No. 5, December 1971, p. 751-755.

outcomes constituting large, in some cases crucial, segments of their teaching programs. While affective behaviors were foremost among such neglected areas, higher cognitive outcomes were often not evaluated, leaving to be operationalized only the simpler cognitive behaviors. The suggestion[43] that such outcomes represent the only goals that can be regarded as realistically attainable, cannot be seriously entertained. Such a suggestion is in opposition to the many authorities, referred to directly and indirectly in the foregoing pages, who urge instruction aimed at higher cognitive and affective levels, at skills and attitudes essential to a proper concept of instruction in the various subjects. A justifiable conclusion appears to be that, in general, respondents failed to operationalize not only affective behaviors but also higher level cognitive skills recommended as appropriate to the various subjects.

3. Discussion of the Data in Relation to Proposition Three.

The third proposition states that the instructional objectives being aimed at by a clear majority of the grade twelve teachers of all of the six principal teaching subjects

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[43] Carl Bereiter, "A Proposal to Abolish Education," in Brian Crittenden (ed.), Means and Ends in Education: Comments on Living and Learning, Toronto, The Ontario Institute for Studies in Education, 1969, p. 62.

taken as a whole are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior. The data appropriate to this proposition can be discussed with greater pertinence by making reference to a hypothetical student who might have studied each of the six principal teaching subjects under the direction of a teacher representative of the clear majority of the respondents taking part in the present research.

This hypothetical student would have found that in all six classes there was evaluation of knowledge and comprehension behaviors, that application behavior was evaluated in four classes, synthesis behavior in three, analysis and evaluation behavior in two, while in no class would performance related to affective outcomes have been evaluated. In other words, the student would have found that the behavior most often required of him was low-level cognition, that higher cognitive levels were operationalized in a minority of the classes, and that behavior related to attitudes and values was not evaluated at all.

The situation just described can hardly be reconciled with that envisaged by the Ontario Department of Education's Circular H.S. 1 1972/73[44] which, after disparaging as futile an emphasis on the mere accumulation of factual knowledge,

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[44] Ontario Department of Education, op. cit., p. 5.

stressed the importance in most subjects of learning to "investigate, analyze, synthesize, interpret and record,"[45] and of making provision for learning processes based on inquiry, research and independent study. In the second section of the present chapter attention was drawn more than once to the fact that learning behaviors of these very kinds were not operationalized by a clear majority of respondents. It is suggested that the behaviors on which most emphasis was laid in the six subjects are not those best calculated to foster in students "an active desire to continue learning throughout their lives,"[46] nor do they seem adequate in scope for furthering "the primary purpose of the school [which] is to enable students to develop to the maximum of their potential as individuals and as members of society."[47]

The Department's circular gave expression to principles similar to those which had been enunciated a few months earlier by Lawless,[48] Director of the Ottawa Board of Education, in addressing Ottawa high school principals at a

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45 Ibid.

46 Ibid., p. 4.

47 Ibid., p. 5.

48 Donald Lawless, Address to Principals, Professional Development Conference, El Mirador Motor Inn, Ottawa, March 12, 1971, mimeo, p. 1-5.

professional development conference. The director spoke of the need in the high schools for a variety of educational goals in accord with the needs of students, and depicted the school not as restricted to imparting knowledge but as a laboratory of inquiry where students were encouraged to initiate and pursue fruitful avenues of exploration.[49] With regard to affective behavior, Lawless encouraged efforts to help the students develop into mature, responsive and responsible citizens, committed to preserving and strengthening the free society in which they live. The director's suggestion that students might well abandon courses which did not meet their needs could conceivably place in a quandary any student who sought the operationalization of behaviors extending beyond a rather restricted cognitive range.

In 1969, the students themselves made a report[50] to the former Collegiate Institute Board in which they supported a broader range of objectives than those operationalized by respondents in the present study. They spoke of learning as a continuous process of discovery rather than an imparting

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49 Ibid., p. 3 and 4.

50 Final Reports of the Trustees', Administrators', Teachers' and Students' Committees on Living and Learning--The Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario [Ottawa, Collegiate Institute Board, 1969], Section D, mimeo, p. 2.

of knowledge, of the value of group discussion and independent study, of the desirability of developing a questioning mind, of the duty of education to promote social betterment, of the need to help the student to grow in open mindedness, tolerance and awareness of new ideas, different cultures, and the values of other civilizations.[51] In all, these educational outcomes comprised a more extensive set of behaviors than are represented by the objectives operationalized by a clear majority of the teachers providing data for this study.

It is concluded that the major emphases of the instruction given by these teachers covered a narrower range of behaviors than was considered desirable by the Ontario Department of Education, the Ottawa Board of Education, or even by representative student opinion in 1969. Evidently there was a very considerable gap between what the respondents were attempting to achieve in the teaching-learning situation, and the broad range of educational outcomes that others concerned in the process of schooling postulated as desirable and even necessary. This situation leads to other considerations and specific recommendations that are included in the section that follows.

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51 Ibid.

4. Supplementary Considerations and Recommendations.

The discussion of the data contained in the preceding three sections leads to at least two major considerations. The first of these arises from the current orientation towards minimizing emphasis on compulsory subjects and inviting the student to select courses that he feels are best suited to his interests, abilities and goals for the future.[52] Since this is the official policy in the high schools of the province, an essential concomitant would appear to be an obligation on the part of each teacher to ensure that the student has the chance of experiencing as fully as possible the knowledge, skills and attitudes appropriate to the subject. That the real situation is other than this has been shown from the case of the hypothetical student referred to earlier who had no chance of choosing six classes where a fully comprehensive range of learning behaviors would be operationalized.

The second major consideration deals with the contradictions that are evident throughout the study. These contradictions are inherent in the dichotomy between the narrow range of learning behaviors operationalized by respondents and the broad range of learning outcomes espoused by

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52 Ontario Department of Education, op. cit., p. 5.

such groups as departmental and local board sources, by the students, by authorities on instruction in the principal teaching subjects, and even by the teachers themselves.

These two major considerations encourage the suggestion that the schools tend to ignore or, at best, to give only lip-service to learner-centered concepts such as stages of human development, affective concomitants of learning, and developmental tasks. This neglect is said to come about for three principal reasons: first, because it is difficult to implement such aims honestly,[53] then because the ability to understand and retain verbally presented ideas is more easily teachable,[54] and finally, because the proper function of the school in the affective area especially has yet to be worked out.[55]

Whatever degree of validity may lie in these suggestions, teachers cannot rest satisfied with learning behavior confined to low cognitive levels when voices like those of

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53 James M. Paton, "Innovation in Ontario Schools--Summary and Interpretation of the Conference," in The Ontario Institute for Studies in Education, Re-thinking Education, Toronto, The Institute, 1969, p. 45.

54 D.P. Ausubel, Learning Theory and Classroom Practice, Bulletin No. 1, Toronto, Ontario Institute for Studies in Education, 1967, p. 21.

55 G.T. Evans, "Attitudes, Means and Ends," in Crittenden (ed.), op. cit., p. 48.

Goodlad,[56] Macdonald,[57] Sand,[58] Alexander,[59] and Sergiovanni and Starratt[60] stress that schools must assist the student to become a healthy and mature human being by increasing his knowledge of the world, by leading him towards a commitment to his society and its problems, and by fostering his human and personal growth. The alternative to accepting these tasks could be, as Macdonald,[61] Silberman[62] and Willis[63]

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56 John I. Goodlad, "The Educational Program to 1980 and Beyond," in Edgar L. Morphet and Charles O. Ryan (eds.), Implications for Education of Prospective Changes in Society, New York, Citation Press, 1967, p. 47-60.

57 James B. Macdonald, "The High School in Human Terms: Curriculum Design," in Norman K. Hamilton and J. Galen Saylor (eds.), Humanizing the Secondary School, Washington, D.C., Association for Supervision and Curriculum Development, NEA, 1969, p. 35-54.

58 Ole Sand, "High School 1980," The Bulletin of the National Association of Secondary School Principals, Vol. 55, No. 355, May 1971, p. 50-53.

59 William M. Alexander, "The Acceleration of Curriculum Change," in Richard I. Miller (ed.), Perspectives on Educational Change, New York, Appleton-Century-Crofts, 1967, p. 341-358.

60 Thomas J. Sergiovanni and Robert J. Starratt, Emerging Patterns of Supervision: Human Perspectives, New York, McGraw-Hill, 1971, p. 205-240.

61 Macdonald, op. cit., p. 39.

62 Charles E. Silberman, Crisis in the Classroom: The Remaking of American Education, New York, Random House, 1970, p. 336.

63 Harold L. Willis, "The New Student: Rebel and Reformer," Paper presented before the Canadian Education Association Convention, Halifax, N.S., September 24, 1969, mimeo, 1-13 p.

have powerfully pointed out, an increase in student apathy and alienation.

Were action to be taken on the basis of the present study, the first task would be to determine the degree to which the findings are typical of Ottawa high school teachers of the six principal subjects at all grade levels. There can be no justification for an assertion that respondents in this study were representative of all teachers of the six subjects in Ottawa high schools, but the claim could be made that while it seems highly unlikely that the respondents constituted a group unique as regards the instructional objectives they entertained, further studies should be conducted to determine the extent of the unsatisfactory situation revealed by the data. Subsequent developments could take account of the fact that the evidence from the first two columns of the response form suggests that teachers are favorably disposed towards a broad range of educational outcomes. The real problem is likely to be that teachers do not know how to implement newer ideas, concepts and procedures. It could well prove difficult to remedy this situation for change occurs very slowly in schools,[64] and is unlikely to come about through such readily

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64 Thomas F. Green, "Schools and Communities: A Look Forward," Harvard Educational Review, Vol. 39, No. 2, 1969, p. 236, 237, 243, 249.

available means as the provision of literature and conferences.[65] Ensuring that teachers in training are being prepared to operationalize a broad range of appropriate learning behaviors is an initial and essential step, but teachers already working in the classroom constitute a different and immediate problem. It is recommended here that rather than try to change so complex an institution as the whole school, educational authorities should concentrate on setting up in each of a half-dozen schools one department that could serve as a model for all Ottawa teachers of the subject concerned. For example, the Department of English at Hillcrest High School could be staffed with carefully chosen teachers who, in addition to sound preliminary education in the implementation of a comprehensive range of learning outcomes appropriate to instruction in English, would be helped to delineate clearly the goals to be aimed at, and given ready access not only to the instructional material needed, but also to conceptual and, if possible, operational models of what they should be attempting. Functioning with the firm approval of a board administration convinced of the value of what was being tried, and operating in a school where the principal is

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65 John I. Goodlad, "Educational Change: A Strategy for Study and Action," Journal of Secondary Education, Vol. 46, No. 4, April 1971, p. 159.

favorably disposed towards their efforts, such a group of teachers could serve to broaden English teachers' understanding of how to use the potential of their subject in contributing to the education of the whole person. Similar model departments for other subjects, set up in different schools of the city, could prove a powerful factor in bridging the existing gap between the world of educational rhetoric and the functional world of classroom practice. Although the recommendation outlined above seems feasible and capable of implementation without unduly interfering with the present effectiveness of any school, a degree of inconvenience and difficulty should be accepted as a comparatively small price to pay for warding off the inevitable results of making no attempt to improve the quality of instruction.

The reference to an attempt at improving instruction underscores another limitation of the present research: the study has done no more than identify kinds of educational outcomes for which there is some measure of reliable evidence that teachers endeavored to foster related learning behaviors. The attempt to encourage learning is clearly not synonymous with success in the endeavor. All teachers, not only those in the model departments, need information about the availability of measures of a variety of learning behaviors; they need guidance in the proper use of such measures, and they require training in creating their own unsophisticated yet adequate

evaluation methods. These tasks constitute a potentially fruitful field for the activity of curriculum and subject consultants. While it is accepted that there could be learning outcomes which are not readily susceptible to evaluation, the importance of wise evaluation in efficient and effective instruction should not be minimized.

This study has made use of the Bloom-Krathwohl taxonomies to identify different kinds of learning behaviors. The author records his belief that there should be a measure of reserve associated with such use until further research has demonstrated the degree to which the taxonomic levels articulate with learning and teaching in high school classrooms.

This fourth chapter has discussed the significance of the data in terms of the three propositions basic to the research and has made recommendations for supplementary studies and appropriate action. A brief summary of the whole research report along with conclusions and recommendations is given in the next section.

SUMMARY AND CONCLUSIONS

This study was designed to identify and then to classify into kinds of learning behavior the instructional objectives that were operationalized at grade twelve level in six important teaching subjects. The purpose was to find reliable evidence that the qualities currently spoken of by educationists as desirable characteristics of secondary school education were in fact given strong emphasis in the learning experiences that composed typical teaching subjects from the main areas of study in Ottawa English-speaking high schools.

The research sought to find how closely the following three propositions corresponded to the actual teaching situation:

1. The instructional objectives judged appropriate by a clear majority of the grade twelve teachers of each of the six principal teaching subjects correspond closely to the objectives included in their teaching programs, and to those regarding which they evaluate related student performance.

2. The instructional objectives being aimed at by a clear majority of the grade twelve teachers of each of the six principal teaching subjects are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

3. The instructional objectives being aimed at by a clear majority of the grade twelve teachers of all of the six principal teaching subjects taken as a whole are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

It was found that none of these propositions could be sustained. The objectives included in teaching programs were found to cover a narrower range of kinds of learning behavior than the objectives which the teachers judged appropriate to their courses, while the objectives with which teachers associated evaluation of related student behaviors were found to be even narrower in scope than the objectives included in teaching programs. With regard to the second proposition it was found that in each of the subjects the major emphasis of instruction was restricted to cognitive behavior, principally to low-level cognitive learning. Objectives operationalized in all six teaching subjects taken as a whole were found to be likewise limited to low-level cognitive learning.

It was concluded that while teachers were favorably disposed towards a broad range of educational outcomes for their teaching subjects, unspecified circumstances were leading them to operationalize learning behaviors much more limited in scope than they themselves would wish, inadequate in terms of the potential benefits inherent in the subjects, and at variance with modern demands that the secondary school concern itself with the education of the whole person.

While caution must be exercised over unjustifiably generalizing these conclusions beyond the teachers involved in the research, it is recommended that further research studies

be designed to find the degree to which the findings from the present study apply beyond the respondents, the group of subjects and the grade level with which this study was concerned. Associated research should also be conducted to establish the causes of teacher failure to operationalize objectives towards which they are favorably disposed. The need for further similar studies is recognized. It is recommended, however, that the findings of the present study justify immediate action to set up, in selected high schools of the city, model subject departments where instruction would be in accord with modern criteria about suitable learning outcomes, and from which guidance could be given to all teachers about the implementation of instruction aimed at a broad range of educational objectives.

Given the importance to instruction of ongoing evaluation, it is further recommended that immediate guidance be given to teachers about the availability and use of a variety of procedures for adequate evaluation of a broad range of kinds of learning behavior.

Finally, it is recommended that the appropriate authorities take steps to ensure that teachers-in-training be prepared to carry out the kind of broadly based instruction which, while neglected by teachers participating in this study, is generally recognized as essential to meeting the needs of young people today.

In bringing the report of this research to a close the author emphasizes that it would be an error to use the findings as an indictment of teaching in Ottawa high schools. Among the factors that should act as a deterrent to drawing such conclusions are the restricted number of respondents and the lack of detailed information about their professional background and experience. An appropriate use of the investigation reported in these pages would be to identify areas in which further research is required. The author emphasizes the following as important examples of such specific areas:

(i) the extent to which the situation revealed in the study prevails at other levels and in other subjects within high schools;

(ii) the ways in which social expectations influence the goals of classroom instruction;

(iii) the specific roles of teachers, consultants, school administrators and board officers in improving the range and quality of instructional objectives;

(iv) the most effective contributions that Faculties of Education can make in preparing teachers who have an adequate conception of the objectives of instructional programs;

(v) methods of accelerating the implementation of beneficial change in schools;

(vi) the degree to which the Bloom-Krathwohl taxonomies articulate with learning and teaching in high school classrooms.

BIBLIOGRAPHY

Beauchamp, George A., Curriculum Theory, Wilmette, Ill., Kagg Press, 1968, vii-186 p.

Gives a review of the status of curricumul theory, describes the practices and concepts relating to theory development, and traces the major developments which have occurred in curriculum theory. The principal issues confronting the curriculum theorist are also outlined. The book constitutes a valuable background for studies related to curriculum, giving guidance with regard to major principles and authorities.

Bloom, Benjamin S., J.T. Hastings, and G.F. Madaus, Handbook on Formative and Summative Evaluation of Student Learning, New York, McGraw-Hill, 1971, v-923 p.

This recent work gives an invaluable and detailed overview of the evaluation of student learning, dealing not only with evaluation techniques in general, but also with evaluation in each of the major subject disciplines. The writers have included contributions from specialists on each of the major areas of study. In its emphasis on precisely expressed instructional objectives, the detailed examples it gives for each of the disciplines, and its insistence on the place of evaluation in effective teaching and learning, this book serves as one of the most important resources for the study reported in these pages.

Bloom, Benjamin S. (ed.), Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook I: Cognitive Domain, New York, David McKay, 1956, 1-207 p.

A committee of college and university examiners offer in this text a rationale for and an explanation of a taxonomy of cognitive educational goals. The major taxonomic levels distinguished in this book were employed in classifying the objectives used in this study.

Crittenden, Brian (ed.), Means and Ends in Education: Comments on Living and Learning, Toronto, Ontario, Institute for Studies in Education, 1969, 7-128 p.

In discussing aspects of education in Ontario the various authors who offer views in this book provide an important background for the study and a useful reference point for interpreting the findings that came from the research.

Goodlad, John I., "Educational Change: A Strategy for Study and Action," Journal of Secondary Education, Vol. 46, No. 4, April 1971, p. 156-166.

Reviews developments in concepts and ideas related to teaching and instruction, suggests that the impact of these on the functioning classroom has been minimal, and outlines means for implementing educational change. Goodlad's ideas supported the orientation of this study toward teachers' objectives.

--------, "The Educational Program to 1980 and Beyond," in Edgar L. Morphet and Charles O. Ryan (eds.), Implications for Education of Prospective Changes in Society, New York, Citation Press, 1967, p. 47-60.

Points to the discrepancy between officially stated purposes of schooling and what is actually taking place in the classroom. This article was one of the factors that led the researcher to investigate the instructional level in Ottawa high schools.

--------, "Thought Invention and Research in the Advancement of Education," The Educational Forum, Vol. 33, No. 1, November 1968, p. 7-18.

Argues that the attempt to gain acceptance for certain innovations appears to exhaust the energy needed for the gathering and interpretation of data that would serve to promote promising new developments in education. Goodlad urges inquiries such as that conducted in the present study.

Goodlad, John I. and Maurice N. Richter, The Development of a Conceptual System for Dealing with the Problems of Curriculum and Instruction, Los Angeles, University of California and Institute for Development of Educational Activities, [1966], i-69 p.

Presents a conceptual system for the systematic identification and interrelationship of the central problems of curriculum. Including and going beyond the Tyler rationale, it is intended to stimulate research and organize thinking in the curriculum field. Its use by Myers served to orient this study to the classroom teacher.

Gronlund, Norman E., Stating Behavioral Objectives for Classroom Instruction, Toronto, Ontario, Collier-Macmillan, 1970, iii-58 p.

Based on the assumption that effective teaching and testing require a clear conception of the desired learning outcomes, this text suggests realistic principles for the expression of instructional objectives which clearly communicate their intent.

Hall, E.M. and L.A. Dennis (Co-Chairmen), Living and Learning, Report of the Provincial Committee on Aims and Objectives of Education in the Schools of Ontario, Toronto, Ontario Department of Education, 1968, 4-221 p.

The report is basic to the present study in that it illustrates the importance attached to educational goals in Ontario. In its insistence on the crucial importance of the teacher at the instructional level, its stress on operational as opposed to verbalized goals, and in its major orientation toward affective learning outcomes, the report gives support to major elements in this study.

Hodgetts, A. Bernard, What Culture? What Heritage? A Study of Civic Education in Canada, Toronto, Ontario Institute for Studies in Education, 1968, 1-122 p.

One of the few studies of the instructional level in Canadian education. It reports a highly unsatisfactory situation in the teaching of Canadian studies. The findings suggested the need for the present research.

Jenkins, Joseph R., Stanley L. Deno, "A Model for Instructional Objectives--Responsibilities and Advantages," Educational Technology, Vol. 10, No. 12, December 1970, p. 11-16.

In order to assist in the proper evaluation of learning and of the effectiveness of teaching, the authors offer a model to help in the explicit statement of objectives. The model was used in determining the method of formulating the objectives for this research.

Kibler, Robert J., Larry L. Barker, and David T. Miles, Behavioral Objectives and Instruction, Boston, Allyn and Bacon, 1970, vii-196 p.

Explains the role of behaviorally stated objectives in the instructional process, offers a rationale justifying their use, and reproduces the condensed version of the Bloom-Krathwohl taxonomies in addition to presenting a taxonomy for psychomotor behavior. The text was used in the training of the classifying team involved in this research.

Krathwohl, David R., Benjamin S. Bloom, and Bertram B. Masia, Taxonomy of Educational Objectives: The Classification of Educational Goals. Handbook II: Affective Domain, New York, David McKay, 1964, vii-196 p.

This work is complementary to that edited by Bloom and presents the rationale for and explanation of a taxonomy of affective educational goals. The major taxonomic levels distinguished in this book were used in classifying the objectives that are used in this study.

Lawless, Donald, Address to Principals, Professional Development Conference, El Mirador Motor Inn, Ottawa, March 24, 1971, mimeo, p. 1-5.

The Director of Education of the Ottawa Board of Education suggests guidelines that principals could follow in ensuring that high schools are responsive to the needs of the times, and gives special emphasis to the fostering of attitudes and values.

Lindvall, C.M. (ed.), Defining Educational Objectives, Pittsburgh, University of Pittsburgh Press, 1964, 1-83 p.

This report of the Regional Commission on Educational Coordination and the Learning Research and Development Center claims to include contributions from some of America's most productive thinkers on the question of defining instructional objectives. The papers included in the report constituted a basic reference point throughout this research.

Macdonald, James B., "Curriculum Theory," The Journal of Educational Research, Vol. 64, No. 5, January 1971, p. 196-200.

The article offers a useful categorization of the work of curriculum theorists into three major schools. The categories are used in this study to review the place of objectives in the thinking of the principal theoretical positions.

--------, "The High School in Human Terms: Curriculum Design," in Norman K. Hamilton and J. Galen Saylor (eds.), Humanizing the Secondary School, Washington, D.C., Association for Supervision and Curriculum Development, 1969, p. 35-54.

Presents a set of humanistically oriented curriculum development principles and insists that the commitment to schooling in democratic societies must be to a broad range of human values.

McClure, Robert M. (ed.), The Curriculum: Retrospect and Prospect, Seventieth Yearbook of the National Society for the Study of Education, Part I, Chicago, Ill., The Society, 1971, v-364 p.

In its emphasis on the defects of the school today, on the need for specification of the direction reform should follow, and on the necessity for establishing criteria for evaluation of innovative programs this yearbook provided a valuable background for the research reported in these pages.

Myers, Donald A., Decision Making in Curriculum and Instruction, Dayton, Ohio, Institute for Development of Educational Activities, 1970, vii-54 p.

Presents and explains a model for specifying the agents and the procedures for decision-making in curriculum and instruction. Myers' model, set within the Goodlad-Richter theoretical framework, was used in locating this research at the instructional level and in focusing attention on the classroom teacher.

Ojemann, Ralph H., "Should Educational Objectives Be Stated in Behavioral Terms?," Parts I and II, The Elementary School Journal, Vol. 68, No. 5, February 1968, p. 223-231; Vol. 69, No. 5, February 1969, p. 229-235.

Reviews objections to the use of instructional objectives expressed in behavioral terms, and concludes that for effective communication of instructional intent, the best method currently available involves the use of behavioral referents.

Popham, W. James, E.W. Eisner, H.J. Sullivan, and L.L. Tyler, Instructional Objectives, AERA Monograph Series 3, Chicago, Rand McNally, 1969, v-142 p.

Gives an exchange of views in relation to the movement toward operationally stated objectives, and covers a wide spectrum of opinions on the usefulness of the practice. The subject is given very comprehensive treatment.

Schwab, Joseph J., The Practical: A Language for Curriculum, Washington, D.C., National Education Association Center for the Study of Instruction, 1970, iii-40 p.

The author claims that the field of curriculum is moribund, has become so through excessive reliance on theory, and can be redeemed only through a concentration on the classroom situation. Makes a valuable contribution to the rationale for this study.

Stephens, J.M., The Process of Schooling: A Psychological Examination, New York, Holt, Rinehart and Winston, 1967, iii-168 p.

In explaining his spontaneous theory of schooling, the author presents a comprehensive review of attempts to improve the instructional process, and provides strong support for the orientation of the present research in his insistence on the crucial importance of the teacher.

Taba, Hilda, Curriculum Development--Theory and Practice, New York, Harcourt Brace and World, 1962, v-526 p.

The work presents an elaboration and development of Ralph Tyler's basic work on curriculum, linking major ideas and problems in a manner that brings a large measure of order into the diversity of elements that constitute the field of curriculum. The present study relies heavily on the book in sections dealing with the importance of objectives and of evaluation of learning outcomes.

Tyler, Ralph W., Basic Principles of Curriculum and Instruction, Chicago, University of Chicago Press, 1949, v-128 p.

Possibly the most influential work on curriculum, this book supports the importance attached by the present study to educational objectives and the evaluation of learning outcomes.

Willis, Harold L., "The New Student: Rebel and Reformer," Paper presented before the Canadian Education Association Convention, Halifax, N.S., September 24, 1969, mimeo, 1-13 p.

Examines the phenomenon of student dissent, suggests what might be done to prevent the development of situations that promote dissent, and urges that schools aim at enriching rather than diminishing the individual.

APPENDIX 1

RESPONSE FORM AND ACCOMPANYING LETTERS

APPENDIX 1

The Ottawa Board of Education
330 Gilmour Street
Ottawa 4, Ontario

The Principal
_____High School
Ottawa, Ontario

Dear

The Advisory Research Committee on April 8 approved the research request of Mr. Desmond Connelly, a doctoral student at the Faculty of Education, University of Ottawa. Mr. Connelly's research concerns "Operational Objectives in High School Teaching."

The teachers of Grade 12 Chemistry, History and World Politics, English, Geography, French and Mathematics are asked to spend about one-half hour answering certain questionnaires. Their answers are to be anonymous in that they are not required to sign their questionnaires. It is intended that the questionnaires be distributed and collected at the school. This is not a request to administer the questionnaire during school hours as the teachers are asked to answer the questions on their own time. Completion of these forms is, of course, at the option of each teacher.

It would be appreciated if you would designate a secretary to receive the materials from Mr. Connelly, distribute the forms to the teachers, and receive the completed forms from the teachers to be held until Mr. Connelly picks them up.

Mr. Connelly plans to deliver the materials to your school on either the 27th or 28th of April. At that time (or at any other time should you prefer) he will be available to discuss his study with you.

Cordially,

G. Halpern, Ph.D.,
Director of Research.

UNIVERSITY OF OTTAWA
Faculty of Education
Graduate Studies

To Grade Twelve Teachers of
Chemistry, English, French,
History and World Politics,
Geography, Mathematics

April 29, 1971.

Dear Colleagues:

This letter invites your co-operation in a study of teaching objectives as the classroom teacher perceives them. Since the attitudes of teachers are often overlooked in educational matters, the study places major emphasis on teachers' reactions to an important part of their work.

Your co-operation will not entail great demands on your time. The response form to be filled in can be completed in half an hour or less. The form consists of a number of rather precise teaching objectives. You are asked to indicate the degree of your acceptance of each. Replies will be anonymous and confidential.

I hope that you will accept this study as worthy of your time and attention. Besides being likely to provoke stimulating questions among teachers who have the difficult task of wedding theory and practice, the study has been highly recommended by the Faculty of Education of the University of Ottawa, and even at this early stage has drawn favourable recognition from one national body. Nevertheless, its success depends primarily on your support and co-operation.

A response form for the appropriate subject is included with each copy of this letter. If you are not prepared to take part in the study, would you kindly return all the material to the designated secretary in the front office of your school, but I am hopeful of receiving your generous co-operation in this study, and earnestly invite all to participate.

Yours sincerely,

Desmond Connelly.

APPENDIX 1

DIRECTIONS TO RESPONDENTS

Please supply the following information:

(a) underline the teaching subject to which your attached response sheet refers.-
Chemistry English French History World Politics
Geography Mathematics

(b) underline the class(es) to which you teach that subject.-
5-yr. A & S 4-yr. A & S 5-yr. ST & T
4-yr. ST & T 4-yr. B & C

The response form that follows these directions is designed to find the degree of your acceptance of certain teaching objectives.

An objective can be regarded as an intended outcome of a learning situation.

Important Preliminary Note: The examples given after each objective are intended to make the meaning of the objective plain to the respondent. The examples do not necessarily reflect the degree of difficulty of work that students do in class. It is the objective and not the example to which the respondents are asked to react.

Please read the directions for each column before marking the column.

Directions for the column headed Appropriate:
If you consider that an objective is appropriate for a grade twelve course of study in the subject you teach, mark with a tick (✓) the space in the first column alongside the statement of that objective.

Directions for the column headed Included:
A number of objectives, though probably not all of them, will have been included in the program of work that you planned for your grade twelve classes this year (1970-71).

Place a tick (✓) in the second column next to those objectives that you included in the work planned for your class in the current year.

Directions for the column headed Assessed:

In some cases you have decided to evaluate students' success in attaining the objectives you have set.

While it may be that some objectives are indirectly evaluated this third section of the response form is concerned only with the objectives for which you have a definite method of directly evaluating student attainment.

For some of the objectives you are sure of the methods you have used (or will use, for example, in the final examinations) to evaluate student performance. You are also clear in your own mind as to how those methods evaluate student behavior in relation to particular objectives.

In these cases you are asked to place a tick (✓) in the third column next to the appropriate objectives.

On the final page of the response form you are invited to add objectives which you consider important in your own teaching but which have not been included in the list of suggestions contained in the form.

Considerable importance will be attached to the objectives added by teachers. Please express them as precisely as possible. Mark the three columns for these objectives as for the others in the response form.

Please seal your completed response form in the unmarked envelope provided and return it to the designated secretary in the front office of your school before May 11th.

Thank you for your cooperation.

Your replies are made anonymously. Nothing will be done to identify either respondents or schools.

OBJECTIVES IN THE TEACHING OF CHEMISTRY

Appropriate - App
Included - Inc
Assessed - Ass

	App	Inc	Ass
1. The student will acquire specific information which he will be able to recall when required. Such information compasses: (a) Specific facts, e.g. what is the chemical element most abundant in the earth's crust? (b) Scientific terminology, e.g. What is meant by mineral? (c) Concepts of chemistry, e.g. What is the meaning of chemical change? Of density?	____	____	____
2. The student will be able to use and interpret correctly signs, symbols, abbreviations and practices used in chemistry to represent certain entities and relationships. e.g. $Ag^+ + Cl^- \longrightarrow AgCl$	____	____	____
3. The student will be able to order phenomena in the correct sequence of their occurrence in nature or under experimental manipulation. e.g. He will know that the action of acidic ground water on limestone mountains over time tends to produce hollow caverns and leads to the formation of stalactites and stalagmites.	____	____	____
4. The student will be able to order objects and phenomena in accordance with the organizing structures established by scientists, and will recognize the characteristics or properties that determine the placement of an object or phenomenon in a particular category. e.g. -The student will know why mercury is classified as a liquid, how it differs from a solid, why it is classified as a chemical element. -He will know why helium, neon, krypton are in the same family of elements.	____	____	____

	App	Inc	Ass
5. The student will be able to recall and describe certain scientific techniques and procedures. e.g. -How the specific gravity of mercury can be determined. -How to determine whether or not a substance contains starch.	____	____	____
6. The student will be able to recall a particular scientific principle or law. e.g. He will know if it is true to claim that at constant temperature the absolute pressure and volume of a gas are inversely proportional.	____	____	____
7. The student will know the major conceptual schemes or theories of chemistry. e.g. -The theory of ionic behavior. -The orbital model of the atom. -What the energy released in a nuclear fission reactor results from.	____	____	____
8. The student will be able to <u>identify</u> a fact, concept, procedure, classification scheme, criterion for classification, principle or theory, when it is presented in a <u>new context</u>--that is, one which differs from the context in which the original instruction was given. e.g. He will recognize the principle which is being applied in putting salt on ice-covered roadways.	____	____	____

	App	Inc	Ass
9. The student will be able to translate a fact, term, concept, convention, trend, principle or theory presented in one symbolic form to another symbolic form. e.g. Given the chemical equation for any reaction, the student translates it into a verbal statement about the reaction.	____	____	____
10. The student will be able to observe accurately various objects and phenomena, and to communicate effectively, and in appropriate language, the observations he has made.	____	____	____
11. The student will be able to select the appropriate measuring instrument for obtaining the data he is seeking, and will be able to use it for accurate measurement of objects, changes, etc.	____	____	____
12. The student will be able to recognize a problem, formulate a working hypothesis to direct his investigation of it, and decide on appropriate procedures to test the hypothesis. e.g. Given a bell jar which encloses a pot-plant and a burning candle, the student will be able to prove why the candle goes out, but can be re-kindled some days later, although no further air has been admitted to the bell-jar.	____	____	____
13. The student will be able to process experimental data by organizing his observations and measurements in tables, graphs or in other readily readable formats.	____	____	____

	App	Inc	Ass
14. The student will be able to interpret experimental observations and data to show the significance of the experimental results, and will then draw an appropriate "conclusion," that is, evaluate the hypothesis under test.	____	____	____
15. The student will accept theory building as a legitimate part of scientific enquiry.	____	____	____
16. The student will be able to formulate theoretical models to accommodate known phenomena and principles, to test the adequacy of the theoretical model, and to revise and refine it where necessary. e.g. -The student is able to formulate and test a hypothesis about the product which results from heating Fe and S together. -The student is able to decide which of a series of facts about <u>solids</u> are explained by a given theoretical model of a <u>crystalline solid</u>.	____	____	____
17. The student will be able to apply relevant scientific knowledge to the solution of a <u>new</u> problem. e.g. -What can be done to speed up this chemical reaction? -How was this limestone cave formed? -How could large quantities of amonia be cheaply made from nitrogen and hydrogen?	____	____	____
18. The student will be able to manipulate laboratory apparatus with facility, and carry out a sequence of manipulations to a desired end. e.g. -Use of bunsen burner, balance, microscope, etc. -Collection of a sample of gas insoluble in water.	____	____	____

	App	Inc	Ass
19. The student will have a favourable attitude towards science and scientists. e.g. He sees it as very important in modern life; he believes that it is closely associated with the progress of mankind; he tries to learn about the lives of scientists.	____	____	____
20. The student will accept the processes of scientific inquiry as a valid way to conduct his thinking.	____	____	____
21. The student will find pleasure in science learning experiences. e.g. -He will be interested in science activities that he can carry out for himself. -He will choose to watch TV programs dealing with scientific subjects. -He will read books dealing with some aspects of science.	____	____	____
22. The student will be aware of the logical status of statements made by scientists. e.g. He will be able to distinguish observations, interpretation, law, theory.	____	____	____
23. The student will recognize the limitations of scientific explanation. e.g. He recognizes that there are questions that cannot be fully answered by using the methods of empirical science.	____	____	____

	App	Inc	Ass
24. The student will have a historical perspective on the scientific enterprise. e.g. He will appreciate how initial discoveries have to be exploited and developed over a period of time to achieve more complete usefulness. The use of penicillin, stemming from Fleming's discovery of Penicillium Notatum, is an illustration of this.	____	____	____
25. The student will have a realization of the relationships among scientific progress, technical achievement and economic development.	____	____	____

APPENDIX 1

OBJECTIVES ADDED BY TEACHERS

	App	Inc	Ass

OBJECTIVES IN THE TEACHING OF ENGLISH

Appropriate - App
Included - Inc
Assessed - Ass

	App	Inc	Ass
1. The student will have a clear understanding of the meaning of an extensive vocabulary. e.g. His written expression will show mastery of a wide range of words.	____	____	____
2. The student will be able to express carefully considered ideas in precise, clear, correct written English.	____	____	____
3. The student will have facility in clear, correct speech.	____	____	____
4. The student will be able to recognize and recall specific facts, generalizations and theories. Examples of questions that test this: - Where is the metaphor in the following lines? -Who was the English writer buried as a Samoan chieftain in 1894? -What is the difference between a ballad and a sonnet?	____	____	____
5. The student will be able to compare and contrast specific literary texts. e.g. -Compare the attitudes of two poets as revealed in two poems having a similar theme. -Compare the functions of the minor characters in two novels.	____	____	____

	App	Inc	Ass
6. The student will be able to relate knowledge about an author to a literary work or part of one. e.g. -How does this work reflect the life of the author? -What important aspect of the poet's life is suggested by these lines?	____	____	____
7. The student will be able to appreciate specific literary works in the light of the literary, social, cultural, political and historical contexts that are relevant to them. e.g. What were the strongest forces influencing the writings of James Joyce?	____	____	____
8. The student will be able to classify a work or part of a work by type. e.g. -Is this personification, or is it metaphor? -Would you classify this as tragedy, as satire or as romance?	____	____	____
9. The student will be able to apply specific critical systems to a particular literary work. e. g. -Would Aristotle have regarded Macbeth as a tragedy? -Which of the following legends would Shakespeare have considered suitable for a tragedy?	____	____	____
10. The student will be able to recognize the archetypes that are evident in a literary work, identifying allusions to mythology, relating the work to traditional stories and themes, etc. e.g. -Who in this story would be a modern counterpart of a Knight of the Round Table? -Of what ancient theme is this story a retelling? -Is Huckleberry Finn a quest story?	____	____	____

	App	Inc	Ass
11. The student will find pleasure in active involvement in a literary work through some form of <u>re-creative response</u>, like declamation, recitation, acting or mime.	____	____	____
12. The student will <u>identify</u> with a literary work, in the sense that he will discuss the characters or events of the work as if they were real people or real events.	____	____	____
13. The student will be able to recognize the <u>phonemic features</u> of a literary work or part of it. e.g. The rhythm, the metre, the rhyme, alliteration, etc.	____	____	____
14. The student will be able to classify the <u>lexical</u> features of a literary work, or part of it. e.g. Diction, etymology, connotation and ambiguity.	____	____	____
15. The student will be able to recognize the <u>syntactic</u> features of a literary work or part of it. e.g. Grammar, sentence type, sentence length, sentence transformations.	____	____	____
16. The student will be able to analyse the <u>literary devices</u> in a work, including the description of metaphors, images and other literary or rhetorical devices such as paradox, irony, foreshadowing, dialogue and narration.	____	____	____

	App	Inc	Ass
17. The student will be able to perceive and discuss the content of a literary work in terms of action, character, setting and theme.	____	____	____
18. The student will be able to discern and describe the interrelationship of content and form in a literary work, and to recognize other significant relationships. e.g.-What relationship is evident between the first eight lines and the last six? -What aspect of the poem makes the mood of the speaker most apparent?	____	____	____
19. The student will be able to <u>interpret</u> a literary work, in the sense that he will be able to ascribe significance to it, or to a part of it. e.g. Of the four interpretations of this poem that have been suggested to you, which do you consider best?	____	____	____
20. The student will be able to express an <u>evaluation</u> of a literary work under one or more of the following heads: -evaluation based on effect, -evaluation of technique, -evaluation of the vision of the writer. e.g. -Of the three paragraphs you have read, which shows the best choice of words? Which is the most convincing? Which is spoiled by too much exaggeration? -How could the claim be justified that this is a good poem?	____	____	____

APPENDIX 1

	App	Inc	Ass
21. Students will develop in their reading a preference for works of literary merit.	____	____	____
22. The student will develop a repertoire of adequate response patterns for the discussion of a literary work. e.g. One such pattern would be that students base their discussion on the subject, the form, and the point of view of the work.	____	____	____
23. The student will have a positive interest in literature, taking some such tangible form as joining a book or theatre club, making regular use of the library, watching a dramatic presentation on television.	____	____	____
24. The student will see literature as a source of pleasurable activity.	____	____	____
25. The student will accept the importance of literary works in general, recognizing the importance of a free literature in a free society, and seeing that literature is both a source of pleasure and a source of knowledge.	____	____	____

APPENDIX 1

OBJECTIVES ADDED BY TEACHERS

	App	Inc	Ass

OBJECTIVES IN THE TEACHING OF FRENCH

Appropriate - App
Included - Inc
Assessed - Ass

	App	Inc	Ass
1. The student will be able to recognize and recall basic vocabulary, the pronunciation of specific letters or letter combinations, and the spelling of specific sounds. e.g. The student can supply a synonym for épuisé.	____	____	____
2. The student will demonstrate a knowledge of rules and patterns. e.g. -Allez-vous au cinéma? Oui, je - au cinéma. -Quel est l'adjectif qui correspond à l'adverbe heureusement? -Which two words are pronounced the same: seau; saute; sot?	____	____	____
3. The student is able to differentiate elements and patterns and to discriminate between elements. e.g. -Are the two sentences you hear the same or different: Il vient manger. Il vient de manger. -Given a diagram of a wheel, and another of a street, the student can tell which is referred to by the sentence: Voilà la rue.	____	____	____
4. The student will have correct habits in the spoken and written skills. e.g. -He will recite with fluency and correct pronunciation a learned dialogue. -When given the stimulus: Il va à l'école, he can say or write it correctly in the negative.	____	____	____

	App	Inc	Ass
5. The student will be able to understand and convey <u>explicit</u> (as opposed to implicit) meaning. e.g. -The student carries out instructions given orally in French. -He can answer correctly "comprehension questions" about the meaning of a passage written in French. -He can give the English equivalent of spoken or written sentences. - He can make a meaningful sentence out of such elements as: homme, aller, église.	____	____	____
6. The student will be able to understand and convey <u>implicit</u> meaning. e.g. -Give a meaningful English equivalent for: Tu veux que je te fasse le grand jeu ou préfères-tu le marc de café? -Je vais à un meeting. Re-write in three ways to express: obligation; permission; irony.	____	____	____
7. The student will be able to use French in a way similar to that in which he uses his native English. e.g. -He is able to carry on a simple conversation in French. -He is able to find out specific information from a French-speaking person without resorting to the use of English. -He can write an account of an incident in reasonably complex sentences.	____	____	____
8. The student will be aware of differences between written and spoken language, of the differences between languages, of differences in outlook, customs and values among people.	____	____	____

	App	Inc	Ass
9. The student will be tolerant of the differences referred to in No. 8.	____	____	____
10. The student will have an increased interest in language, culture, social studies, literature and the arts. e.g. -He watches French-Canadian television programs. -He goes to French movies.	____	____	____
11. The student will derive a sense of satisfaction from mastering certain aspects of French or from learning about another culture.	____	____	____
12. The student will be ready to contribute in some way to the achievement of cross-cultural understanding.	____	____	____

APPENDIX 1

OBJECTIVES ADDED BY TEACHERS	App	Inc	Ass

OBJECTIVES IN THE TEACHING OF GEOGRAPHY

Appropriate - App
Included - Inc
Assessed - Ass

	App	Inc	Ass
1. The student will be able to recall or recognize certain facts, such as - the factors in the establishment of an industrial estate; - the periods in the evolution of a city.	____	____	____
2. The student will comprehend a wide range of key concepts, that is, he will be able to transform them into other words. Such concepts could be: climate, the city as environment, manufacturing.	____	____	____
3. The student will comprehend a wide range of generalizations which bind concepts together. e.g. -Regional government is the key to the city's problems. -Urban revolution proceeded from the neolithic revolution.	____	____	____
4. The student will comprehend the groups of factors that constitute various important geographic interrelationships. e.g. -The growth of a city as determined by site factors. -The degree of city influence in surrounding areas as determined by distance from the city.	____	____	____
5. The student will be skilful in locating information through the use of the library, the card catalogue, major relevant reference books.	____	____	____

APPENDIX 1

	App	Inc	Ass
6. The student will be able to interpret graphic and symbolic information as contained in maps, graphs, tables, charts, air photographs, etc.	_____	_____	_____
7. The student will be able to identify central issues and underlying assumptions. e.g. In a passage dealing with transport the student will recognize that the major assumption is that an efficient transport network is vital to the modern city.	_____	_____	_____
8. The student will be able to evaluate evidence and draw warranted conclusions. e.g. Given four diagrams of different sets of site factors the student can determine the appropriateness of one site over the others for city development at a particular time.	_____	_____	_____
9. When faced with the analysis of a problem, the student will be able to produce reasonable hypotheses for testing. e.g. When presented with an example of city decay or transition, the student will know what factors to look for in analysing the causes.	_____	_____	_____
10. The student will be able to make effective use of a specific mode of inquiry. e.g. -The Case Study Technique. -Simulation Games.	_____	_____	_____

	App	Inc	Ass
11. The student will be effective in democratic group participation appropriate to classroom discussion. e.g. He is able to use the formal techniques of debate, parliamentary procedure, panel discussion, and the like.	____	____	____
12. The student is able to help fellow discussants towards sound conclusions through persuasive presentation, and through the expression of clear and reasonable statements.	____	____	____
13. The student is able to make effective use of independent study and research.	____	____	____
14. The student will demonstrate skill in organizing and presenting the results of inquiry by such means as -Isopleth Mapping -Research Reports.	____	____	____
15. The student will have a scientific approach to human behavior. e.g. -He will believe that social behavior has multiple rather than single causes. -In collecting and interpreting data he will exhibit objectivity, open-mindedness, relativism, scepticism and precision.	____	____	____
16. The student will have a humanitarian outlook on the behavior of others. This will include two basic qualities: 1. empathy -by which he is capable of feeling what it is like to be in someone else's position. 2. tolerance -respecting the right of others to be different in their social behavior.	____	____	____

	App	Inc	Ass
17. The student will be cognizant of the social problems and of the social contributions of others. e.g. He understands that ultimately each individual is dependent on all others for his security and well-being.	____	____	____
18. The student shows in a tangible way his interest in specific social problems such as pollution in the environment and crime in the city. e.g. He reads relevant journal articles, attends lectures and conferences on such matters, follows appropriate TV and radio programs, discusses social issues with others.	____	____	____
19. The student shows his involvement by being disposed to act on the basis of a decision made after using critical judgment on a well-researched social problem.	____	____	____
20. The student accepts a number of democratic values after a critical analysis of the arguments pro and con.	____	____	____

APPENDIX 1

OBJECTIVES ADDED BY TEACHERS

	App	Inc	Ass

APPENDIX 1

OBJECTIVES IN THE TEACHING OF HISTORY AND WORLD POLITICS	Appropriate - App Included - Inc Assessed - Ass App	Inc	Ass
1. The student will be able to <u>recall</u> or <u>recognize</u> certain <u>facts</u>, such as dates, names, constitutional provisions, legislative enactments. e.g. Given five items the student can identify those which were in the <u>Communist manifesto</u> and those which were in the <u>Declaration of the Rights of Man</u>.	____	____	____
2. The student will <u>comprehend</u> a wide range of key <u>concepts</u>, that is, he will be <u>able to transform them into other words</u>. Such concepts could be: historical bias; mind set; frame of reference; society; nationalism; sovereignty; culture, etc.	____	____	____
3. The student will comprehend a wide range of <u>generalizations</u> which bind concepts together. e.g. From a list of four suggested answers he can select two important issues that precipitated the French Revolution.	____	____	____
4. The student will know the components of various important historical philosophies and movements and is able to recognize how data are related to them. e.g. -He would be able to select from a number of statements those that fit in with a given theory. -Given five different social systems he would be able to say which of them would be most likely to subscribe to the notion that the "greatest good" is synonymous with "the greatest good for the greatest number."	____	____	____

	App	Inc	Ass
5. The student will be skilful in locating information through the use of the library, the card catalogue, major relevant reference books.	____	____	____
6. The student will be able to interpret graphic and symbolic information as contained in maps, graphs, tables, charts, cartoons, time-lines.	____	____	____
7. The student will be able to identify central issues and underlying assumptions. e.g. -After reading material on a given topic the student selects from four statements presented to him the one that best expresses the major assumption made by the writer. -In the light of his reading the student can enumerate three or four principles on which a country's foreign policy was based.	____	____	____
8. The student will be able to evaluate evidence (e.g. discriminate between fact, opinion, propaganda, primary and secondary sources, etc.) and to draw warranted conclusions. e.g. -Which of these paragraphs goes farthest in making an emotional appeal rather than a rational argument? -In the four pairs of facts and corresponding conclusions, indicate any conclusion that is not supported by the corresponding fact.	____	____	____
9. When faced with the analysis of a problem, the student will be able to produce reasonable hypotheses for testing. e.g. How would you go about investigating the way in which decisions are made in the government of a country?	____	____	____

	App	Inc	Ass
10. The student will be able to make effective use of a specific mode of inquiry. e.g. -The one described by Fenton. -The Harvard Controversial Issues Strategy.	____	____	____
11. The student will be effective in democratic group participation appropriate to classroom discussion e.g. He is able to use the formal techniques of debate, parliamentary procedure, panel discussion, and the like.	____	____	____
12. The student is able to help fellow discussants to sound conclusions through persuasive presentation, and through the expression of clear and reasonable statements.	____	____	____
13. The student is able to make effective use of independent study and research.	____	____	____
14. The student will demonstrate skill in organizing and presenting the results of inquiry by such means as the Research Essay, the Document Report, the Book Report, the Seminar Paper, etc.	____	____	____
15. The student will have a scientific approach to human behavior. e.g. -He will believe that social behavior has multiple rather than single causes. -In collecting and interpreting data, he will exhibit objectivity, open-mindedness, relativism, scepticism and precision.	____	____	____

	App	Inc	Ass
16. The student will have a humanitarian outlook on the behavior of others. This will include two basic qualities: empathy - by which he is capable of feeling what it is like to be in someone else's position; tolerance - respecting the right of others to be different in their social behavior.	____	____	____
17. The student will be cognizant of the social problems and of the social contributions of others. e.g. He understands that ultimately each individual is dependent on all others for his security and well-being.	____	____	____
18. The student shows in a tangible way his interest in specific social problems. e.g. He reads historical or political journal articles. He attends lectures and conferences on social problems. He follows appropriate TV and radio programs. He discusses social issues with others.	____	____	____
19. The student shows his involvement by being disposed to act on the basis of a decision made after using critical judgment on a well-researched social problem.	____	____	____
20. The student accepts a number of democratic values after a critical analysis of the arguments pro and con. e.g. -freedom of speech, press and religion -the dignity, equality and brotherhood of man -the right of the majority to prevail -the right of the minority to be respected.	____	____	____

APPENDIX 1

OBJECTIVES ADDED BY TEACHERS

	App	Inc	Ass

APPENDIX 1

OBJECTIVES IN THE TEACHING OF MATHEMATICS

	App	Inc	Ass
1. The student will have a sound knowledge of specific facts so that he will be able to reproduce or recognize material in almost exactly the same form as it was presented in the course of study.	____	____	____
2. The student will have a thorough knowledge of terminology, being able to relate examples to generic names (e.g. recognize a right angle), and to know what is meant by basic mathematical instructions (e.g. simplify the expression).	____	____	____
3. The student will have the ability to carry out algorithms, being able to manipulate elements of a stimulus according to some learned rules. e.g. -to bisect a line segment; -to solve a simple linear equation.	____	____	____
4. The student will have a sound knowledge of the <u>concepts</u> related to the course of study. e.g. -What is meant by the <u>conjugate</u> of a given complex number? -What is the locus of points in a plane at a given distance from a given point?	____	____	____
5. The student will have a sound knowledge of the principles, rules and generalizations that are relevant to the course of study. e.g. -What is the sum of the angles of a triangle? -What is the exterior angle of a triangle equal to? -What can be said about the value of a fraction if the numerator and the denominator are equal?	____	____	____

	App	Inc	Ass
6. The student will have the ability to transform problem elements from one mode to another, from verbal to pictorial representation, from verbal representation to symbolic form, or vice versa. e.g. -Change a verbal statement into an equation. -Does 1/8%x equal .00125x?	____	____	____
7. The student will have a sound knowledge of the mathematical structure appropriate to the course of study. e.g. -If P=M+N, then which of the following is true: N=P-M; P-N=M; N+M=P? -What number can be used for X to make this statement false: 25 + X = X + 30 - 5	____	____	____
8. The student will be able to follow a line of mathematical reasoning, that is, a mathematical argument. e.g. the proof of a theorem.	____	____	____
9. The student will have the ability to read and interpret a mathematics problem. e.g. -What whole numbers make the following sentence true: $5 \leq N - 3 < 10$? -Given a problem stated in two or three sentences, the student is able to identify what he is required to find.	____	____	____
10. The student will be able to solve routine problems. e.g. Given $\log_b 2 = 0.693$ and $\log_b 3 = 1.099$, find $\log_b 12$.	____	____	____

	App	Inc	Ass
11. The student will be able to formulate a decision to a problem by determining a relationship between two sets of information. e.g. -Which method yields greater interest: 5% compound quarterly, or 5.25% compound annually? -Given the dimensions of two triangles decide which has the greater area.	____	____	____
12. The student will be able to analyze data, meaning that he will be able to distinguish relevant from irrelevant information, to assess what additional information is required, to determine what related problems may be examined to help with the solution of the present exercise, or to separate the exercise into component parts. e.g. What additional information must be known in order to solve the following problem: How much interest compounded quarterly does a bank pay on $300 kept in a savings account for one year?	____	____	____
13. The student will have the ability to recognize patterns, isomorphisms and symmetries; that is, he will be able to find something familiar in a set of data, in given information, or in a problem context. e.g. -The last digit in 4^{10} is 0,2,4,6, or 8? -How would you reduce the area of a driveway without changing its semi-circular shape or its width?	____	____	____
14. The student will be able to solve non-routine problems, transferring previous mathematics learning to a new context. e.g. -In the equation $ax^2+bc+c = 0$, $a+b+c = 0$ which of the following values for x satisfies the equation: b/a, c/a, (a+c)/b, -b/a, -c/a?	____	____	____

	App	Inc	Ass
15. The student will have the ability to <u>discover</u> relationships, re-structuring problem elements in a new way to formulate a relationship. e.g. -The length of a diagonal of a square is $x + y$. Find the area of the square. -Determine the number of lines obtained by joining n distinct points in the plane, no three of which are collinear.	____	____	____
16. The student will have the ability to construct proofs as distinct from reproducing or recalling them. e.g. -Show that the expression $\frac{\sin 3x + \sin x}{\cos 3x + \cos x}$ may be reduced to the form $\tan 2x$.	____	____	____
17. The student will be able to criticize a mathematical argument. e.g. -Given a "proof" which is incorrect, the student will be able to locate the step or steps which are incorrect.	____	____	____
18. The student will be able to <u>discover</u> a relationship and to <u>construct</u> a proof to substantiate the discovery. e.g. Draw three triangles, one with three acute angles, one with one right angle, and one with obtuse angle. Using straightedge and compasses, bisect each angle of each triangle. What relationship do you observe between the three angle bisectors of each triangle? Do you think this would be true for every triangle? Why?	____	____	____
19. The student will have a favorable <u>attitude</u> towards mathematics, finding pleasure in doing it.	____	____	____

	App	Inc	Ass
20. The student will have a preference for mathematics activities over other choices. e.g. He will be interested in an activity like learning to program a computer; he will be interested in further studies in math; he would like it to figure in his leisure and recreational activities; he would like to learn more about mathematicians.	____	____	____
21. The student will have a high level of motivation towards mathematics, experiencing within himself a force that causes him to <u>act favorably</u> towards it. e.g. He shows persistence and thoroughness in working out mathematics problems; he regularly borrows mathematics books from the library; he does unassigned problems for his own interest or pleasure.	____	____	____
22. The student will experience a facilitating anxiety towards mathematics; that is, he has a certain feeling of apprehension that spurs him to work hard and so improve his performance. e.g. He feels that he does his best work on mathematics tests that are important; he feels that he maintains a good mark mainly by doing well on big tests; he approaches a mathematics test with a degree of nervousness that is largely forgotten once he starts the test.	____	____	____
23. The student will have a favorable estimation of himself as a person and as a student of mathematics. e.g. He finds it easy to talk in front of the mathematics class; he is proud of his mathematics homework; he feels that he tries to do in mathematics the very best work that he can; he likes to be called on in mathematics class; he feels that he is doing well.	____	____	____

	App	Inc	Ass
24. The student will have an extrinsic appreciation of mathematics, seeing its usefulness in ordinary life.	____	____	____
25. The student will have an intrinsic appreciation of mathematics, finding in it something which he likes and enjoys.	____	____	____
26. The student will have an operational appreciation of mathematics, finding satisfaction in communicating mathematics content to other persons through various media. e.g. He likes to tutor another student, to present a mathematics item to the class, to make up his own computer program.	____	____	____

APPENDIX 1

OBJECTIVES ADDED BY TEACHERS

	App	Inc	Ass

APPENDIX 2

INSTRUCTIONAL OBJECTIVES ADDED BY RESPONDENTS

APPENDIX 2

OBJECTIVES ADDED BY RESPONDENTS[1] (Chemistry)

1. Appreciates the importance of self-discipline in tackling problems. ** S1 R1

2. Prefers cooperation with others for mutual benefit to competing against them. ** S1 R1

3. Recognizes that scientists have a responsibility to society to use their knowledge and power for the good of mankind. ** S1 R1

4. Recognizes the need to protect the rights of the individual against the dehumanizing process inherent in the changes brought about in our society by scientific and technological change. ** S1 R4

5. Is aware of the history of scientific discoveries, of their application and their effects. ** S1 R4

6. Demonstrates a knowledge of safe practices in carrying out laboratory practices. ** S3 R1

7. Recognizes the applicability of learned material to a different situation and uses the material to find a solution in the new context. ** S8 R1

8. Develops skill in the systematic use of source materials and in the evaluation of the information he gathers. ** S8 R1

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1 On this and subsequent pages the following codes are used:

S: School number.
R: Respondent number
*: Objective judged appropriate.
**: Objective included in teaching program.
***: Student behavior related to the objective was evaluated.

9. Is able to work independently in the laboratory making his own decisions about the most appropriate procedures to adopt. ** S8 R1

10. Develops an innovative and intuitive approach in laboratory work. ** S8 R1

11. Knows the chemical composition of materials available for domestic use. ** S8 R3

12. Uses his chemical knowledge to guide him in a discriminating purchase of goods for household use. ** S8 R3

13. Is aware of the historical development of simple processes from the times of early settlers down to the present. ** S8 R3

14. Works (for a limited period) without direction. *** S9 R2

15. Recognizes the element of uncertainty in each of the quantitative measurements he makes; he evaluates the final answer in the light of the uncertainty regarding such measurements, and is able to gauge the degree of significance to be attached to conclusions drawn from his final answer. ***S9 R2

16. Accumulates a sufficiently large vocabulary in the language of chemistry to be able to communicate and interpret the results of experiments in terms of the chemical equation expressed in sentence form. *** S11 R2

17. Is able to demonstrate that he can apply basic mathematical techniques in the interpretation of experimental data. *** S11 R2

18. Is encouraged to order his thinking processes and to develop an analytical approach towards the solving of problems. ** S11 R2

19. Will regard the special techniques, skills and processes of thinking as developed by a study of chemistry, as applicable to all areas of learning. ** S11 R2

20. Is encouraged to interact with others in attacking and in solving laboratory problems and projects, and will extend this approach into other areas of learning. ** S11 R2

APPENDIX 2

OBJECTIVES ADDED BY RESPONDENTS (English)

1. Develops understanding of and tolerance for opinions that differ from his own, through a study of the conflicting attitudes illustrated in the literary works he evaluates. ** S1 R3

2. Forms logical opinions on a wide variety of subjects. ** S1 R4

3. Has the ability to formulate appropriate questions. ** S2 R2

4. Develops proficiency in correct English usage. *** S2 R2

5. Identifies logical fallacies, especially in the spoken word. *** S4 R3

6. Perceives the relationship between the various elements in a film and the apparent purpose of the filmmaker. *** S4 R3

7. Identifies slant and bias in the reporting of information. ** S4 R3

8. Is competent in sentence and paragraph construction. *** S4 R3

9. Has facility in the formulation and clear expression of opinions based on factual references. *** S4 R3

10. Has an extensive vocabulary. ** S4 R3

11. Criticizes the media intelligently. ** S4 R3

12. Thinks independently and expresses his ideas clearly. ** S4 R3

13. Does some creative writing of different genres, e.g., poems, plays, short stories. *** S9 R3

14. Argues in a logical and convincing manner. *** S9 R3

15. Grows in knowledge of his own personality through acting out roles. ** S9 R3

16. Demonstrates maturity in dealing with others in the classroom. ** S9 R3

17. Discovers a relationship between literary conflicts and characters, and aspects of his own life. ** S9 R5

18. Sees literature as an expression of the problems and feelings which are shared by all human beings, and thus acquires a greater understanding of his own life and the lives of others. ** S13 R3

19. Learns to read rapidly. ** S13 R3

APPENDIX 2

OBJECTIVES ADDED BY RESPONDENTS (French)

1. Voluntarily seeks out opportunities to make use of his ability to speak, read and write French, so as to grow in understanding of the attitudes of francophone people. ** S1 R1

2. Develops the ability of thinking with facility in French. ** S1 R4

3. Knows by heart the conjugation of certain key verbs in French. ** S3 R1

4. Finds enjoyment in the study of French. *** S4 R4

5. Is able to conduct a lesson in French playing the role of teacher. *** S4 R4

6. Is able to give in French a fluent oral summary of narrative material he has read. *** S5 R2

7. Can discuss and debate in good French certain topics arising from literature he has read. *** S5 R2

8. Can explain in good French a sequence of events shown in a series of pictures. *** S5 R2

9. Acquires a solid basis of French grammar and structures. *** S6 R1

10. Reads and appreciates works of French literature of moderate difficulty. *** S6 R1

11. Senses the rhythm, musicality and beauty of expression in sentences in French. *** S7 R2

12. Memorizes French poems. *** S7 R2

13. Memorizes the words of and sings French songs. *** S7 R2

14. Makes an elegant translation of a French passage into English. *** S7 R2

15. Shows competence in original prose composition in French. *** S7 R2

16. Expresses himself fluently in French. ** S7 R3

17. Takes an interest in French culture and in the people to whom it belongs. ** S7 R3

18. Is able to translate paragraphs or sentences using the correct tense and mood of the verb. ** S11 R1

19. Is able to express ideas correctly in written French. ** S11 R1

20. Knows and uses a wide vocabulary of common words. ** S11 R1

21. Realizes that knowledge of one foreign language helps him to learn others more easily. ** S11 R4

22. Recognizes that a methodical approach fosters the learning of a foreign language. ** S11 R4

23. Is able to communicate in French. ** S12 R2

24. Is able to understand, to speak, to read and to write French. ** S12 R2

25. Learns how to work in an orderly manner. ** S12 R3

APPENDIX 2

OBJECTIVES ADDED BY RESPONDENTS
(Geography)

1. Observes and analyzes real-life situations. *** S13 R1

2. Is able to communicate information and concepts via
   (a) visual impact
   (b) logical written development
   (c) oral presentation. ** S13 R1

3. Develops the confidence to express a viewpoint verbally. ** S13 R1

4. Recognizes the danger that modern living poses for the world's flora, fauna and other resources. ** S11 R1

APPENDIX 2

OBJECTIVES ADDED BY RESPONDENTS (History)

1. Makes use of suitable filmed material to add to his understanding of the important ideas of history. *** S1 R1

2. Listens attentively and asks pertinent questions. ** S1 R1

3. Can express his personal reactions to historical facts through a variety of means, e.g., poetry, comment, painting, song..** S1 R1

4. Uses his historical studies to develop a personal philosophy of life. ** S1 R1

5. Is capable of independent learning, having the ability to examine, analyse, draw conclusions, and defend these conclusions. ** S3 R1

6. Develops sympathy and compassion through his study of human behavior in the past. ** S3 R1

7. Interests himself in political and economic problems. *** S4 R1

8. Is aware of the fundamental importance of religion and morality in determining individual and national behavior. ** S5 R3

9. Has a sense of personal responsibility for the maintenance of the rule of law and the democratic process. ** S5 R3

10. Understands the role of the "great man" in history, and the relationship between his actions and social forces. *** S5 R4

11. Is able to distinguish the essential elements in a historical period. *** S5 R4

12. Recognizes that all systems have both strengths and weaknesses and cannot be either totally condemned or universally applauded. ** S5 R4

13. Recognizes the role of accidental happenings in human affairs. ** S5 R4

14. Accepts his duty to defend and preserve a number of democratic values as his personal contribution to the betterment of society. ** S7 R1

15. Gains increasing awareness of the significance of major political and social ideologies in the modern world. *** S11 R1

16. Is able to see the relationship of his own attitude to those of established ideologies. ** S11 R1

17. Has confidence in his own judgment and in the judgment of other students. *** S12 R1

18. Becomes proficient in logical and persuasive argument. *** S12 R1

19. Develops an understanding of the major political systems and trends of today. *** S12 R1

20. Distinguishes the potential causes of revolution. *** S12 R1

21. Understands the major crisis spots in the modern world. *** S12 R1

22. Becomes interested in the study of history through perceiving its relevance in the twentieth century. *** S13 R1

23. Develops logical thinking through comparison, finding cause and effect relationships, etc. *** S13 R1

24. Develops a sense of responsibility rather than a mere awareness of one's rights. *** S13 R1.

25. Gains a knowledge of the subject matter. ** S13 R3

26. Develops critical thought and judgment. ** S13 R3

APPENDIX 2

OBJECTIVES ADDED BY RESPONDENTS (Mathematics)

1. Correctly interprets a problem, selects an appropriate mathematical model related to the problem, discovers the underlying assumptions, and computes a correct solution both by logical reasoning and by accurate calculation. *** S4 R5

2. Communicates precisely, concisely, neatly and logically. *** S4 R5

3. Analyzes a problem carefully and thus reduces its apparent complexity. ** S5 R4

4. Recognizes the applicability of learned material to a different situation and uses the material to find a solution in the new context ** S5 R4 and S3 R4

5. Applies to situations outside the maths class the attitude of meeting a challenge in an orderly confident manner. ** S6 R1

6. Recognizes that an essential factor in the understanding of mathematics is involved in the solution of mathematical problems. ** S10 R3

7. Develops great facility with routine mathematical operations. ** S12 R2

8. In solving problems makes use of material already committed to memory. ** S12 R2

9. Develops the powers of memory. ** S12 R2

APPENDIX 3

CLASSIFICATION OF OBJECTIVES

APPENDIX 3

CLASSIFICATION OF OBJECTIVES

Principal Numerical Quantities Used in the Calculation of Inter-rater Reliability.

Practice Session	Sum of Squares		Degrees of Freedom		Mean Squares		Reliability
	between	within	between	within	between	within	
1	89.2	303.6	11	108	8.109	2.81	.65
2	234.89	386.9	9	90	26.098	4.298	.83
3	576.12	665.1	13	126	44.317	5.278	.88
4	330.04	409	9	90	36.67	4.54	.87
5	158.625	192.7	11	108	14.42	1.78	.87
6	313.37	190.9	14	135	22.38	1.41	.93

$$r = 1 - (M S_w \div M S_b)$$

Classifications of Chemistry Objectives.

Raters	Objectives																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
R1	C1	C2	C1	C4	C1	C1	C1	C3	C2	C4	C6	C5	C2	C6	C6	C5	C3	P	A2	A3	C4	C4	A4	A1	C5
R2	C1	C2	C1	C1	C1	C1	C1	C2	C2	C5	C3	C5	C3	C6	C6	C5	C3	C3	A2	A2	A2	C4	A4	A1	A1
R3	C1	C2	C1	C3	C1	C1	C1	C3	C2	C4	C3	C5	C2	C6	A3	C5	C4	P	A3	A3	A2	C4	C6	C6	C5
R4	C1	C1	C1	C1	C1	C1	C1	C3	C2	C4	C3	C5	C2	C6	C6	C5	C3	P	A3	A3	A2	C4	A4	A1	C5
R5	C1	C1	C1	C3	C1	C1	C1	C3	C2	C5	C3	C5	C4	C6	A3	C6	C3	P	A3	A2	A2	C4	A4	A1	C5
R6	C1	C2	C2	C3	C1	C1	C1	C2	C2	C5	C3	C5	C2	C2	A3	C5	C3	C1	A3	A3	A2	C4	C6	C2	C5
R7	C1	C2	C3	C3	C1	C1	C1	C2	C2	C4	C3	C5	C2	C6	C6	C6	C3	C1	A1	A3	A3	C4	A4	A1	C5
R8	C1	C3	C1	C3	C1	C1	C1	C3	C2	C5	C3	C5	C3	C6	C6	C6	C3	P	A3	A4	A2	A4	A4	A4	A4
R9	C1	C2	C2	C3	C1	C1	C1	C3	C2	C4	C3	C5	C3	C6	A2	C5	C3	P	A3	A4	A2	C4	C6	A3	A4
R10	C1	C3	C2	C2	C1	C1	C1	C2	C2	C4	C6	C6	C2	C6	A3	C6	C3	P	A3	A3	A2	A4	A1	A1	A1
Majority Class'n	C1	C2	C1	C3	C1	C1	C1	C3	C2	C4	C3	C5	C2	C6	C6	C5	C3	P	A3	A3	A2	C4	A4	A1	C5

R: Rater number.
C: Cognitive level.
A: Affective level.
P: Psychomotor behavior.

Classifications of English Objectives.

Raters	Objectives																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
R1	C1	C2	C2	C1	C6	C3	C3	C1	C4	C4	A2	A3	C1	C1	C1	C4	C4	C4	C6	C6	A2	A3	A3	A2	A3
R2	C1	C5	C3	C1	C4	C4	C3	C4	C4	C4	A2	A2	C2	C3	C2	C4	C5	C4	C6	C6	A3	A2	A3	A2	A4
R3	C1	C2	C2	C1	C4	C4	C3	C5	C4	C4	A2	A4	C4	C4	C4	C4	C5	C4	C6	C6	A3	A2	A3	A2	A4
R4	C2	C4	C3	C1	C4	C3	C5	C2	C3	C4	A2	A3	C4	C4	C4	C4	C4	C4	C4	C6	A3	A4	A5	A3	A3
R5	C2	C3	C3	C1	C4	C3	C5	C2	C3	C4	A2	A2	C4	C4	C4	C4	C4	C5	C4	C6	A3	A4	A5	A3	A3
R6	C1	C2	C5	C1	C3	C3	C4	C4	C4	C3	A2	A2	C4	C4	C4	C4	C5	C5	C3	C6	A3	A2	A2	A2	A4
R7	C1	C2	C2	C1	C4	C3	C4	C4	C3	C4	A2	A4	C4	C4	C4	C4	C5	C5	C6	C6	A3	A2	A2	A2	A3
R8	C3	C2	C2	C1	C4	C4	C3	C4	C4	C4	A2	A2	C2	C2	C2	C4	C4	C5	C6	C6	A3	A2	A3	A3	A4
R9	C1	C2	C2	C1	C4	C3	C3	C4	C4	C2	A3	A2	C2	C2	C2	C4	C5	C5	C4	C6	A2	A4	A3	A2	A4
R10	C3	C5	C5	C1	C4	C4	C3	C4	C3	C1	A2	A2	C4	C4	C4	C5	C5	C5	C6	C6	A3	A3	A3	A1	A4
Majority Class'n	C1	C2	C2	C1	C4	C3	C3	C4	C4	C4	A2	A2	C4	C4	C4	C4	C5	C5	C6	C6	A3	A2	A3	A2	A4

C: Cognitive level.
A: Affective level.
R: Rater number.

Classifications of French Objectives.

Raters	Objectives											
	1	2	3	4	5	6	7	8	9	10	11	12
R1	C1	C3	C2	C3	C2	C3	C3	C4	A1	A3	A2	A4
R2	C1	C1	C2	C2	C2	C2	C5	A1	A1	A2	A2	A4
R3	C1	C2	C1	C3	C2	C3	C3	A1	A1	A2	A2	A3
R4	C1	C2	C2	C3	C2	C2	C5	A1	A2	A2	A2	A3
R5	C1	C3	C2	C3	C3	C3	C5	A1	A1	A2	A2	A3
R6	C2	C3	C2	C3	C5	C3	C3	C4	A2	A2	A2	A3
R7	C1	C3	C4	C3	C2	C2	C3	A1	A1	A3	A2	A3
R8	C1	C3	C2	C2	C2	C3	C3	A1	A2	A3	A2	A4
R9	C1	C3	C1	C1	C3	C3	C3	A1	A2	A3	A2	A4
R10	C1	C1	C1	C1	C2	C2	C5	A1	A1	A2	A2	A3
Majority Class'n	C1	C3	C2	C3	C2	C3	C3	A1	A1	A2	A2	A3

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of Geography Objectives.

Raters	Objectives																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
R1	C1	C2	C2	C2	C1	C2	C2	C6	C5	C3	C3	A3	C3	C5	A5	A5	A1	A3	A3	A4
R2	C1	C2	C2	C2	C3	C2	C4	C6	C5	C3	C3	C5	C3	C5	A3	A4	A1	A2	A3	A4
R3	C1	C2	C4	C4	C1	C2	C4	C6	C5	C3	A5	A2	A5	C5	A5	A5	A4	A3	A5	A5
R4	C1	C2	C1	C2	C1	C4	C3	C6	C5	C3	C4	C6	C6	C3	A5	A5	A1	A3	A3	A3
R5	C1	C2	C1	C1	C1	C4	C4	C6	C5	C4	C5	C5	C3	C5	A5	A5	A1	A3	A3	A4
R6	C1	C2	C2	C2	C3	C2	C2	C4	C5	C3	C3	C5	C6	C5	A5	A4	A1	A2	A5	A5
R7	C1	C2	C2	C2	C3	C2	C4	C6	C5	C3	A2	C5	C3	C5	A3	A1	C4	A3	A3	A4
R8	C1	C2	C2	C2	C3	C2	C4	C6	C1	C3	C3	C5	C3	C3	A5	A5	A4	A2	A4	A4
R9	C1	C2	C2	C2	C3	C2	C4	C6	C5	C3	C3	A3	A5	C5	A5	A5	A4	A3	A5	A4
R10	C1	C2	C2	C2	C3	C2	C4	C6	C5	C3	C3	C5	C3	C5	A5	A5	A1	A2	A3	A3
Majority Class'n	C1	C2	C2	C2	C3	C2	C4	C6	C5	C3	C3	C5	C3	C5	A5	A5	A1	A3	A3	A4

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of History Objectives.

Raters	Objectives																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
R1	C1	C2	C3	C4	C1	C2	C4	C6	C5	C3	C5	A3	C3	C5	A5	A5	A1	A2	A3	A2
R2	C1	C2	C2	C2	C3	C2	C4	C6	C5	C3	C3	C5	C3	C5	A3	A4	A1	A2	A3	A4
R3	C1	C2	C1	C4	C3	C2	C4	C6	C5	C3	C3	A2	A5	C5	A5	A5	A4	A3	A5	A5
R4	C1	C2	C1	C1	C1	C4	C3	C6	C5	C3	C3	C6	C6	C5	A5	A5	A1	A2	A3	A2
R5	C1	C2	C1	C3	C1	C4	C4	C6	C5	C4	C5	C5	C3	C5	A5	A5	A1	A3	A3	A4
R6	C1	C2	C2	C3	C1	C2	C2	C4	C5	C3	C5	C5	C6	C5	A5	A4	A1	A2	A5	A5
R7	C1	C2	C2	C3	C3	C2	C4	C6	C5	C3	A2	C5	C3	C5	A3	A1	C4	A3	A3	A3
R8	C1	C2	C2	C3	C3	C2	C4	C6	C5	C3	C3	C5	C3	C5	A5	A5	A4	A2	A4	A4
R9	C1	C2	C1	C3	C3	C2	C4	C6	C5	C3	C3	A3	C3	C5	A5	A5	A4	A3	A5	A4
R10	C1	C2	C2	C3	C3	C2	C4	C6	C5	C3	C3	C5	C5	C5	A5	A5	A1	A2	A3	A4
Majority Class'n	C1	C2	C2	C3	C3	C2	C4	C6	C5	C3	C3	C5	C3	C5	A5	A5	A1	A2	A3	A4

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of Mathematics Objectives.

Raters	Objectives																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
R1	C1	C1	C2	C2	C2	C2	C3	C2	C2	C3	C3	C4	C4	C5	C5	C3	C6	C3	A2	A3	A3	A3	A3	A3	A2	A3
R2	C1	C1	C3	C1	C1	C2	C1	C2	C2	C1	C4	C4	C4	C3	C5	C3	C6	C5	A2	A2	A3	A3	A4	A1	A2	A4
R3	C1	C1	C2	C1	C1	C2	C2	C2	C2	C3	C3	C4	C5	C4	C5	C5	C4	C6	A3	A2	A3	A4	A5	A3	A2	A3
R4	C1	C1	C2	C1	C1	C2	C1	C2	C2	C3	C4	C5	C2	C5	C5	C5	C6	C5	A2	A3	A5	A3	A5	A1	A3	A3
R5	C1	C1	C2	C1	C1	C2	C1	C2	C2	C3	C4	C5	C2	C3	C5	C5	C6	C5	A2	A3	A5	A3	A5	A1	A3	A5
R6	C1	C1	C2	C1	C1	C2	C2	C4	C4	C3	C4	C4	C4	C3	C5	C5	C4	C5	A2	A3	A3	A3	A4	A4	A2	A3
R7	C1	C1	C2	C1	C1	C2	C2	C2	C2	C3	C4	C4	C4	C3	C5	C4	C4	C5	A2	A3	A3	A5	A4	A1	A3	A4
R8	C1	C1	C3	C1	C1	C2	C2	C1	C2	C1	C4	C5	C2	C3	C5	C3	C6	C5	A2	A3	A2	A2	A4	A1	A2	A3
R9	C1	C1	C3	C2	C1	C2	C2	C2	C2	C3	C3	C4	C4	C3	C4	C5	C4	C5	A3	A2	A3	A3	A4	A1	A2	A3
R10	C1	C1	C3	C2	C2	C2	C2	C2	C2	C3	C4	C4	C4	C4	C5	C5	C6	C5	A2	A3	A3	A3	A4	A1	A2	A3
Majority Class'n	C1	C1	C2	C1	C1	C2	C2	C2	C2	C3	C4	C4	C4	C3	C5	C5	C6	C5	A2	A3	A3	A3	A4	A1	A2	A3

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of Objectives Added by Chemistry Teachers.

Raters	Objectives																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
R1	C1	A4	A1	A1	C1	C1	C5	C6	C3	C5	C1	C6	C1	A2	C6	C2	C3	A2	A4	A3
R2	C1	A4	A1	A1	C1	C1	C5	C6	C3	C4	C1	C6	C1	A2	C6	C2	C3	C4	A3	A4
R3	C1	A5	A1	A3	C1	A5	C3	C6	A5	C5	C1	C3	C1	A4	C6	C2	C3	A3	C5	A3
R4	A1	A4	A1	A1	A1	C1	C5	C6	A4	A5	C3	C6	A1	C5	C6	C4	C3	C4	C5	A3
R5	A1	A4	A1	A1	A1	C3	C3	C6	A4	A5	C3	C3	A1	C5	C6	C2	C3	C4	C5	A3
R6	C1	A4	A5	A4	C1	C1	C5	C6	C3	C5	C1	C6	C1	A2	C4	C2	C2	A1	A3	A3
R7	A1	A3	A4	A1	A3	C1	C5	C6	C3	A4	C1	A1	A1	A2	A3	C2	C3	C4	C5	A3
R8	A1	A3	A4	A4	C1	C1	C3	C6	A5	C5	C1	C6	A1	A2	C6	C2	C3	C4	A4	A4
R9	C1	A4	A4	A4	C1	A5	C5	C3	C3	C5	C1	C6	C1	A2	C6	C2	C3	A5	C5	A5
R10	C1	A3	A1	A1	A1	A2	C3	A4	C3	C5	C1	C3	C1	A3	C6	C2	C3	C4	C5	A4
Majority Class'n	C1	A4	A1	A1	C1	C1	C5	C6	C3	C5	C1	C6	C1	A2	C6	C2	C3	C4	C5	A3

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of Objectives Added by English Teachers.

Raters	Objectives																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
R1	A1	C6	C4	C2	C4	C4	C6	C2	C5	C1	C6	C5	C5	C5	C5	A5	C5	A4	C3
R2	A4	A2	C5	C2	C6	C4	C4	C3	C5	C1	C6	A5	C5	A5	C5	A5	A4	A4	P
R3	A3	A4	C5	C3	C6	C4	C6	C2	C2	C1	C6	C5	C5	C5	A4	A5	A4	A4	P
R4	A1	C6	C4	C2	C4	A1	C4	C2	C2	C1	C6	C5	C5	C5	A4	A3	C5	C5	P
R5	A5	C6	C6	C3	C4	A1	C6	C2	C2	C1	C6	C5	C5	C5	A4	A3	C5	C5	C3
R6	A1	C6	C4	C2	C6	C4	C4	C5	C2	C1	C4	C5	C5	C5	C5	A4	C5	A4	P
R7	A1	A4	C4	C2	C6	C4	C6	C2	C2	C1	C6	C5	C5	A3	C5	A2	C5	C5	C3
R8	A1	C6	C5	C2	C4	C4	C6	C3	C2	C1	C6	A5	C5	A5	A5	C5	A5	C5	P
R9	A1	A4	C4	C3	C6	C4	C4	C2	A5	C1	C6	A5	C5	C5	A4	A5	A4	C5	P
R10	A4	C6	C4	C3	C6	C4	C6	C5	C5	C1	C6	A3	A2	C5	C5	A5	A1	C5	A3
Majority Class'n	A1	C6	C4	C2	C6	C4	C6	C2	C2	C1	C6	C5	C5	C5	C5	A5	C5	C5	P

R: Rater number.
C: Cognitive level.
A: Affective level.
P: Psychomotor behavior.

Classifications of Objectives Added by French Teachers.

Raters	Objectives																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
R1	A3	C3	C1	C3	C3	C4	C6	C3	C3	A2	A3	C1	A2	C3	C4	C3	A2	C3	C2	C1	A1	A2	C3	C1	A2
R2	A4	C5	C1	A2	C3	C3	C3	C5	C1	A2	A2	A2	A2	C3	C5	C5	A2	C2	C5	C3	A1	A2	C3	C2	A2
R3	A5	C3	C1	A2	C3	C4	C3	C3	C1	A3	A3	C1	A2	C3	C5	C3	A2	C3	C3	C1	A3	A4	C3	C3	A2
R4	A5	C3	C1	A2	C3	C3	C6	C5	C2	A2	A1	C1	C1	C5	C3	C3	A3	C2	C5	C3	A1	A2	C3	C1	A2
R5	A5	C5	C1	A2	C5	C3	C6	C3	C2	A2	A1	C1	A2	C5	C3	C5	A3	A2	C5	C1	A1	A2	C3	C2	A2
R6	A3	C2	C1	A2	C5	C2	C3	C2	C1	A2	A1	C1	C2	C5	C3	C5	A2	A2	C2	C1	A1	A2	C3	C2	A3
R7	A3	C3	C1	A2	C3	C5	C6	C3	C1	A3	A1	C1	A2	C2	C3	C3	A2	C2	C2	C3	A3	A2	C3	C2	A3
R8	A3	C3	C1	A2	C3	C5	C3	C5	C1	A2	A1	C1	A2	C3	C3	C3	A2	C2	C2	C3	A4	A4	C3	C2	A2
R9	A3	C3	C1	A2	C5	C3	C3	C3	C2	A2	A3	C1	C1	C3	C3	C3	A2	C2	C2	C1	A4	A4	C3	C2	A2
R10	A3	A3	C1	A2	C5	C3	C3	C3	C1	A2	A1	C1	C1	C3	C5	C5	A2	C2	C2	C1	A1	A1	C3	C2	A2
Majority Class'n	A3	C3	C1	A2	C3	C3	C3	C3	C1	A2	A1	C1	A2	C3	C3	C3	A2	C2	C2	C1	A1	A2	C3	C2	A2

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of Objectives Added by Geography Teachers.

Raters	Objectives 1	2	3	4
R1	C4	C5	A2	A1
R2	C4	C5	A4	A1
R3	C4	C5	A5	A4
R4	C4	C5	A2	A1
R5	C4	C5	A2	A1
R6	C4	C2	A5	C3
R7	C4	C2	A2	A1
R8	C4	C3	A2	A4
R9	C4	C3	A5	A4
R10	C4	C5	A2	A1
Majority Class'n	C4	C5	A2	A1

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of Objectives Added by History Teachers.

Raters	Objectives																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
R1	C2	A2	C5	A5	C5	A4	A2	A1	A3	C4	C4	A4	A1	A4	A1	A4	A5	C5	C2	C4	C2	A2	C4	A4	C1	A5
R2	C2	A2	C5	A4	C5	A4	A2	A1	A5	C4	C4	A1	A1	A4	A2	A4	A4	C5	C2	C3	A1	A2	C4	A4	C1	A5
R3	C3	A1	A2	A4	C5	A3	A2	A4	A3	C4	C4	C4	C4	A4	C4	A4	A4	C5	C2	C4	C3	A3	C4	A4	C1	C6
R4	A3	A2	C5	A5	C6	A5	A3	A1	A5	C4	C4	A5	A1	A3	A1	A4	A5	A3	A1	C4	C4	A3	A3	A5	C1	A5
R5	C2	A2	C5	A5	C6	A5	A3	A1	A5	C4	C4	A4	A1	A3	A1	A4	A5	A3	A1	C4	C4	A3	A5	A5	C1	A5
R6	A3	A1	C2	A5	C6	A3	A2	A1	A3	C2	C4	A4	A1	A4	C2	C3	A5	C6	C2	C2	C2	A2	C4	A3	C1	A5
R7	C6	A1	A2	A3	A3	A4	A3	A1	A3	C2	C4	C2	C3	A3	A1	C2	A3	A2	C2	C2	C2	A1	C4	A3	C1	C6
R8	C2	A2	C5	A4	C5	A4	A2	A4	A3	A4	C4	A4	A4	A3	A4	A4	A5	C5	C2	C4	C2	A2	A3	A4	C1	A5
R9	C2	A2	C5	A4	C5	A4	A2	A3	A4	A3	C4	A4	A4	A4	A1	A4	A4	A3	C2	C4	C2	A2	A5	A4	C1	A5
R10	C2	C2	C5	A5	C5	A4	A3	A1	A4	C4	C4	A4	A1	A4	A1	A4	C3	C5	C2	C4	C2	A2	C4	A3	C1	A3
Majority Class'n	C2	A2	C5	A5	C5	A4	A2	A1	A3	C4	C4	A4	A1	A4	A1	A4	A5	C5	C2	C4	C2	A2	C4	A4	C1	A5

R: Rater number.
C: Cognitive level.
A: Affective level.

Classifications of Objectives Added by Mathematics Teachers.

Raters	Objectives 1	2	3	4	5	6	7	8	9
R1	C5	C5	C4	C3	A5	A1	C3	C3	C1
R2	C5	C5	C4	C3	A4	A1	C3	C3	A4
R3	C5	C5	C4	C3	A3	A4	C3	C3	C1
R4	C5	C5	C4	C3	A5	A1	C3	C3	C1
R5	C6	C5	C4	C3	A5	A1	C1	C3	C1
R6	C5	C5	A5	C3	A5	A1	C3	C1	C1
R7	C3	C1	C4	C3	A5	C3	C2	C3	C1
R8	C5	A5	C4	C5	A5	A4	A5	C3	A3
R9	C4	A3	C4	C3	A5	A4	C3	C3	A3
R10	C5	C5	C4	C3	A3	A1	C3	C3	A3
Majority Class'n	C5	C5	C4	C3	A5	A1	C3	C3	C1

R: Rater number.
C: Cognitive level.
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APPENDIX 4

A CONDENSED VERSION OF THE TAXONOMY OF EDUCATIONAL OBJECTIVES

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A CONDENSED VERSION OF THE TAXONOMY OF EDUCATIONAL OBJECTIVES

I. A Condensed Version of the Cognitive Domain of the Taxonomy of Educational Objectives[1]

1.00 Knowledge

Knowledge, as defined here, involved the recall of specifics and universals, the recall of methods and processes, or the recall of a pattern, structure, or setting. For measurement purposes, the recall situation involves little more than bringing to mind the appropriate material. Although some alteration of the material may be required, this is a relatively minor part of the task. The knowledge objectives emphasize most the psychological processes of remembering. The process of relating is also involved in that a knowledge test situation requires the organization and reorganization of a problem such that it will furnish the appropriate signals and cues for the information and knowledge the individual possesses. To use an analogy, if one thinks of the mind as a file, the problem in a knowledge test situation is that of finding in the problem or task the appropriate signals, cues, and clues which will most effectively bring out whatever knowledge is filed or stored.

1.10 Knowledge of Specifics

The recall of specific and isolable bits of information. The emphasis is on symbols with concrete referents. This material, which is at a very low level of abstraction, may be thought of as the elements from which more complex and abstract forms of knowledge are built.

1.11 Knowledge of Terminology

Knowledge of the referents for specific symbols (verbal and nonverbal). This may include knowledge of the most

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1 David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, Taxonomy of Educational Objectives--The Classification of Educational Goals, Handbook II: Affective Domain, New York, David McKay, 1964, p. 176-193.

generally accepted symbol referent, knowledge of the variety of symbols which may be used for a single referent, or knowledge of the referent most appropriate to a given use of a symbol.

To define technical terms by giving their attributes, properties, or relations.

Familiarity with a large number of words in their common range of meanings.

1.12 Knowledge of Specific Facts

Knowledge of dates, events, persons, places, etc. This may include very precise and specific information such as the specific date or exact magnitude of a phenomenon. It may also include approximate or relative information such as an approximate time period or the general order of magnitude of a phenomenon.

The recall of major facts about particular cultures.

The possession of a minimum knowledge about the organisms studied in the laboratory.

1.20 Knowledge of Ways and Means of Dealing with Specifics

Knowledge of the ways of organizing, studying, judging, and criticizing. This includes the methods of inquiry, the chronological sequences, and the standards of judgment within a field as well as the patterns of organization through which the areas of the fields themselves are determined and internally organized. This knowledge is at an intermediate level of abstraction between specific knowledge on the one hand and knowledge of universals on the other. It does not so much demand the activity of the student in using the materials as it does a more passive awareness of their nature.

1.21 Knowledge of Conventions

Knowledge of characteristic ways of treating and presenting ideas and phenomena. For purposes of communication and consistency, workers in a field employ usages, styles, practices, and forms which best suit their purposes and/or which appear to suit best the phenomena with which they deal. It should be recognized that although these forms and conventions

are likely to be set up on arbitrary, accidental, or authoritative bases, they are retained because of the general agreement or concurrence of individuals concerned with the subject, phenomena, or problem.

Familiarity with the forms and conventions of the major types of works; e.g., verse, plays, scientific papers, etc.

To make pupils conscious of correct form and usage in speech and writing.

1.22 Knowledge of Trends and Sequences

Knowledge of the processes, directions, and movements of phenomena with respect to time.

Understanding of the continuity and development of American culture as exemplified in American life.

Knowledge of the basic trends underlying the development of public assistance programs.

1.23 Knowledge of Classifications and Categories

Knowledge of the classes, sets, divisions, and arrangements which are regarded as fundamental for a given subject field, purpose, argument, or problem.

To recognize the area encompassed by various kinds of problems or materials.

Becoming familiar with a range of types of literature.

1.24 Knowledge of Criteria

Knowledge of the criteria by which facts, principles, opinions, and conduct are tested or judged.

Familiarity with criteria for judgment appropriate to the type of work and the purpose for which it is read.

Knowledge of criteria for the evaluation of recreational activities.

1.25 Knowledge of Methodology

Knowledge of the methods of inquiry, techniques, and procedures employed in a particular subject field as well as those employed in investigating particular problems and phenomena. The emphasis here is on the individual's knowledge of the method rather than his ability to use the method.

> Knowledge of scientific methods for evaluating health concepts.
>
> The student shall know the methods of attack relevant to the kinds of problems of concern to the social sciences.

1.30 Knowledge of the Universals and Abstractions in a Field

Knowledge of the major schemes and patterns by which phenomena and ideas are organized. These are the large structures, theories, and generalizations which dominate a subject field or which are quite generally used in studying phenomena or solving problems. These are at the highest levels of abstraction and complexity.

1.31 Knowledge of Principles and Generalizations

Knowledge of particular abstractions which summarize observations of phenomena. These are the abstractions which are of value in explaining, describing, predicting, or in determining the most appropriate and relevant action or direction to be taken.

> Knowledge of the important principles by which our experience with biological phenomena is summarized.
>
> The recall of major generalizations about particular cultures.

1.32 Knowledge of Theories and Structures

Knowledge of the body of principles and generalizations together with their interrelations which present a clear, rounded, and systematic view of a complex phenomenon, problem, or field. These are the most abstract formulations, and they

can be used to show the interrelation and organization of a great range of specifics.

The recall of major theories about particular cultures.

Knowledge of a relatively complete formulation of the theory of evolution.

Intellectual Abilities and Skills

Abilities and skills refer to organized modes of operation and generalized techniques for dealing with materials and problems. The materials and problems may be of such a nature that little or no specialized and technical information is required. Such information as is required can be assumed to be part of the individual's general fund of knowledge. Other problems may require specialized and technical information at a rather high level such that specific knowledge and skill in dealing with the problem and the materials are required. The abilities and skills objectives emphasize the mental processes of organizing and reorganizing material to achieve a particular purpose. The materials may be given or remembered.

2.00 Comprehension

This represents the lowest level of understanding. It refers to a type of understanding or apprehension such that the individual knows what is being communicated and can make use of the material or idea being communicated without necessarily relating it to other material or seeing its fullest implications.

2.10 Translation

Comprehension as evidenced by the care and accuracy with which the communication is paraphrased or rendered from one language or form of communication to another. Translation is judged on the basis of faithfulness and accuracy; that is, on the extent to which the material in the original communication is preserved although the form of the communication has been altered.

The ability to understand nonliteral statements (metaphor, symbolism, irony, exaggeration).

Skill in translating mathematical verbal material into symbolic statements and vice versa.

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2.20 Interpretation

The explanation or summarization of a communication. Whereas translation involves an objective part-for-part rendering of a communication, interpretation involves a reordering, rearrangement, or new view of the material.

The ability to grasp the thought of the work as a whole at any desired level of generality.

The ability to interpret various types of social data.

2.30 Extrapolation

The extension of trends or tendencies beyond the given data to determine implications, consequences, corollaries, effects, etc., which are in accordance with the conditions described in the original communication.

The ability to deal with the conclusions of a work in terms of the immediate inference made from the explicit statements.

Skill in predicting continuation of trends.

3.00 Application

The use of abstractions in particular and concrete situations. The abstractions may be in the form of general ideas, rules of procedures, or generalized methods. The abstractions may also be technical principles, ideas, and theories which must be remembered and applied.

Application to the phenomena discussed in one paper of the scientific terms or concepts used in other papers.

The ability to predict the probable effect of a change in a factor on a biological situation previously at equilibrium.

4.00 Analysis

The breakdown of a communication into its constituent elements or parts such that the relative hierarchy of ideas is made clear and/or the relations between the ideas expressed

are made explicit. Such analyses are intended to clarify the communication, to indicate how the communication is organized, and the way in which it manages to convey its effects, as well as its basis and arrangement.

4.10 Analysis of elements

Identification of the elements included in a communication.

The ability to recognize unstated assumptions.

Skill in distinguishing facts from hypotheses.

4.20 Analysis of Relationships

The connections and interactions between elements and parts of a communication.

Ability to check the consistency of hypotheses with given information and assumptions.

Skill in comprehending the interrelationships among the ideas in a passage.

4.30 Analysis of Organizational Principles

The organization, systematic arrangement, and structure which hold the communication together. This includes the "explicit" as well as "implicit" structure. It includes the bases, necessary arrangement, and mechanics which make the communication a unit.

The ability to recognize form and pattern in literary or artistic works as a means of understanding their meaning.

Ability to recognize the general techniques used in persuasive materials, such as advertising, propaganda, etc.

5.00 Synthesis

The putting together of elements and parts so as to form a whole. This involves the process of working with pieces, parts, elements, etc., and arranging and combining them in such a way as to constitute a pattern or structure not clearly there before.

APPENDIX 4

5.10 Production of a Unique Communication

The development of a communication in which the writer or speaker attempts to convey ideas, feelings, and/or experiences to others.

Skill in writing, using an excellent organization of ideas and statements.

Ability to tell a personal experience effectively.

5.20 Production of a Plan, or Proposed Set of Operations

The development of a plan of work or the proposal of a plan of operations. The plan should satisfy requirements of the task which may be given to the student or which he may develop for himself.

Ability to propose ways of testing hypotheses.

Ability to plan a unit of instruction for a particular teaching situation.

5.30 Derivation of a Set of Abstract Relations

The development of a set of abstract relations either to classify or explain particular data or phenomena, or the deduction of propositions and relations from a set of basic propositions or symbolic representations.

Ability to formulate appropriate hypotheses based upon an analysis of factors involved, and to modify such hypotheses in the light of new factors and considerations.

Ability to make mathematical discoveries and generalizations.

6.00 Evaluation

Judgments about the value of material and methods for given purposes. Quantitative and qualitative judgments about the extent to which material and methods satisfy criteria. Use of a standard of appraisal. The criteria may be those determined by the student or those which are given to him.

6.10 Judgments in Terms of Internal Evidence

Evaluation of the accuracy of a communication from such evidence as logical accuracy, consistency, and other internal criteria.

Judging by internal standards, the ability to assess general probability of accuracy in reporting facts from the care given to exactness of statement, documentation, proof, etc.

The ability to indicate logical fallacies in arguments.

6.20 Judgments in Terms of External Criteria

Evaluation of material with reference to selected or remembered criteria.

The comparison of major theories, generalizations, and facts about particular cultures.

Judging by external standards, the ability to compare a work with the highest known standards in its field--especially with other works of recognized excellence.

II. A Condensed Version of the Affective Domain of the Taxonomy of Educational Objectives.

1.0 Receiving (Attending)

At this level we are concerned that the learner be sensitized to the existence of certain phenomena and stimuli; that is, that he be willing to receive or to attend to them. This is clearly the first and crucial step if the learner is to be properly oriented to learn what the teacher intends that he will. To indicate that this is the bottom rung of the ladder, however, is not at all to imply that the teacher is starting de novo. Because of previous experience (formal or informal), the student brings to each situation a point of view or set which may facilitate or hinder his recognition of the phenomena to which the teacher is trying to sensitize him.

The category of Receiving has been divided into three sub-categories to indicate three different levels of attending to phenomena. While the division points between the sub-categories are arbitrary, the sub-categories do represent a continuum. From an extremely passive position or role on the part of the learner, where the sole responsibility for the evocation of the behavior rests with the teacher--that is, the responsibility rests with him for "capturing" the student's attention--the continuum extends to a point at which the learner directs his attention, at least at a semiconscious level, toward the preferred stimuli.

1.1 Awareness

Awareness is almost a cognitive behavior. But unlike Knowledge, the lowest level of the cognitive domain, we are not so much concerned with a memory of, or ability to recall, an item or fact as we are that, given appropriate opportunity, the learner will merely be conscious of something--that he take into account a situation, phenomenon, object, or stage of affairs. Like Knowledge it does not imply an assessment of the qualities or nature of the stimulus, but unlike Knowledge it does not necessarily imply attention. There can be simple awareness without specific discrimination or recognition of the objective characteristics of the object, even though these characteristics must be deemed to have an effect. The individual may not be able to verbalize the aspects of the stimulus which cause the awareness.

> Develops awareness of aesthetic factors in dress, furnishings, architecture, city design, good art, and the like.
>
> Develops some consciousness of color, form, arrangement, and design in the objects and structures around him and in descriptive or symbolic representation of people, things, and situations.

1.2 Willingness to Receive

In this category we have come a step up the ladder but are still dealing with what appears to be cognitive behavior. At a minimum level, we are here describing the behavior of being willing to tolerate a given stimulus, not to avoid it. Like Awareness, it involves a neutrality or suspended judgment toward the stimulus. At this level of the continuum the teacher is not concerned that the student seek it out, nor even, perhaps, that in an environment crowded with many

other stimuli the learner will necessarily attend to the stimulus. Rather, at worst, given the opportunity to attend in a field with relatively few competing stimuli, the learner is not actively seeking to avoid it. At best, he is willing to take notice of the phenomenon and give it his attention.

> Attends (carefully) when others speak--in direct conversation, on the telephone, in audiences.
>
> Appreciation (tolerance) of cultural patterns exhibited by individuals from other groups--religious, social, political, economic, national, etc.
>
> Increase in sensitivity to human need and pressing social problems.

1.3 Controlled or selected Attention

At a somewhat higher level we are concerned with a new phenomenon, the differentiation of a given stimulus into figure and ground at a conscious or perhaps semiconscious level--the differentiation of aspects of a stimulus which is perceived as clearly marked off from adjacent impressions. The perception is still without tension or assessment, and the student may not know the technical terms or symbols with which to describe it correctly or precisely to others. In some instances it may refer not so much to the selectivity of attention as to the control of attention, so that when certain stimuli are present they will be attended to. There is an element of the learner's controlling the attention here, so that the favored stimulus is selected and attended to despite competing and distracting stimuli.

> Listens to music with some discrimination as to its mood and meaning and with some recognition of the contributions of various musical elements and instruments to the total effect.
>
> Alertness toward human values and judgments on life as they are recorded in literature.

2.0 Responding

At this level we are concerned with responses which go beyond merely attending to the phenomenon. The student is sufficiently motivated that he is not just 1.2 Willing to

attend, but perhaps it is correct to say that he is actively attending. As a first stage in a "learning by doing" process the student is committing himself in some small measure to the phenomena involved. This is a very low level of commitment, and we would not say at this level that this was "a value of his" or that he had "such and such an attitude." These terms belong to the next higher level that we describe. But we could say that he is doing something with or about the phenomenon besides merely perceiving it, as would be true at the next level below this of 1.3 Controlled or selected attention.

This is the category that many teachers will find best describes their "interest" objectives. Most commonly we use the term to indicate the desire that a child become sufficiently involved in or committed to a subject, phenomenon, or activity that he will seek it out and gain satisfaction from working with it or engaging in it.

2.1 Acquiescence in Responding

We might use the word "obedience" or "compliance" to describe this behavior. As both of these terms indicate, there is a passiveness so far as the initiation of the behavior is concerned, and the stimulus calling for this behavior is not subtle. Compliance is perhaps a better term than obedience, since there is more of the element of reaction to a suggestion and less of the implication of resistance or yielding unwillingly. The student makes the response, but he has not fully accepted the necessity for doing so.

Willingness to comply with health regulations.

Obeys the playground regulations.

2.2 Willingness to Respond

The key to this level is in the term "willingness," with its implication of capacity for voluntary activity. There is the implication that the learner is sufficiently committed to exhibiting the behavior that he does so not just because of a fear of punishment, but "on his own" or voluntarily. It may help to note that the element of resistance or of yielding unwillingly, which is possibly present at the previous level, is here replaced with consent or proceeding from one's own choice.

Acquaints himself with significant current issues in international, political, social, and economic affairs through voluntary reading and discussion.

Acceptance of responsibility for his own health and for the protection of the health of others.

2.3 Satisfaction in Response

The additional element in the step beyond the Willingness to respond level, the consent, the assent to responding, or the voluntary response, is that the behavior is accompanied by a feeling of satisfaction, an emotional response, generally of pleasure, zest, or enjoyment. The location of this category in the hierarchy has given us a great deal of difficulty. Just where in the process of internalization the attachment of an emotional response, kick, or thrill to a behavior occurs has been hard to determine. For that matter there is some uncertainty as to whether the level of internalization at which it occurs may not depend on the particular behavior. We have even questioned whether it should be a category. If our structure is to be a hierarchy, then each category should include the behavior in the next level below it. The emotional component appears gradually through the range of internalization categories. The attempt to specify a given position in the hierarchy as <u>the</u> one at which the emotional component is added is doomed to failure.

The category is arbitrarily placed at this point in the hierarchy where it seems to appear most frequently and where it is cited as, or appears to be, an important component of the objectives at this level on the continuum. The category's inclusion at this point serves the pragmatic purpose of reminding us of the presence of the emotional component and its value in the building of affective behaviors. But it should not be thought of as appearing and occurring at this one point in the continuum and thus destroying the hierarchy which we are attempting to build.

Enjoyment of self-expression in music and in arts and crafts as another means of personal enrichment.

Finds pleasure in reading for recreation.

Takes pleasure in conversing with many different kinds of people.

3.0 Valuing

This is the only category headed by a term which is in common use in the expression of objectives by teachers. Further, it is employed in its usual sense: that a thing, phenomenon, or behavior has worth. This abstract concept of worth is in part a result of the individual's own valuing or assessment, but it is much more a social product thathas been slowly internalized or accepted and has come to be used by the student as his own criterion of worth.

Behavior categorized at this level is sufficiently consistent and stable to have taken on the characteristics of a belief or an attitude. The learner displays this behavior with sufficient consistency in appropriate situations that he comes to be perceived as holding a value. At this level, we are not concerned with the relationships among values but rather with the internalization of a set of specified, ideal, values. Viewed from another standpoint, the objectives classified here are the prime stuff from which the conscience of the individual is developed into active control of behavior.

This category will be found appropriate for many objectives that use the term "attitude" (as well as, of course, "value").

An important element of behavior characterized by Valuing is that it is motivated, not by the desire to comply or obey, but by the individual's commitment to the underlying value guiding the behavior.

3.1 Acceptance of a Value

At this level we are concerned with the ascribing of worth to a phenomenon, behavior, object, etc. The term "belief," which is defined as "the emotional acceptance of a proposition or doctrine upon what one implicitly considers adequate ground" (English and English, 1958, p. 64), describes quite well what may be thought of as the dominant characteristic here. Beliefs have varying degrees of certitude. At this lowest level of Valuing we are concerned with the lowest levels of certainty; that is, there is more of a readiness to re-evaluate one's position than at the higher levels. It is a position that is somewhat tentative.

One of the distinguishing characteristics of this behavior is consistency of response to the class of objects,

phenomena, etc., with which the belief or attitude is identified. It is consistent enough so that the person is perceived by others as holding the belief or value. At the level we are describing here, he is both sufficiently consistent that others can identify the value, and sufficiently committed that he is willing to be so identified.

> Continuing desire to develop the ability to speak and write effectively.
>
> Grows in his sense of kinship with human beings of all nations.

3.2 Preference for a Value

The provision for this subdivision arose out of a feeling that there were objectives that expressed a level of internalization between the mere acceptance of a value and commitment or conviction in the usual connotation of deep involvement in an area. Behavior at this level implies not just the acceptance of a value to the point of being willing to be identified with it, but the individual is sufficiently committed to the value to pursue it, to seek it out, to want it.

> Assumes responsibility for drawing reticient members of a group into conversation.
>
> Deliberately examines a variety of viewpoints on controversial issues with a view to forming opinions about them.
>
> Actively participates in arranging for the showing of contemporary artistic efforts.

3.3 Commitment

Belief at this level involves a high degree of certainty. The ideas of "conviction" and "certainty beyond a shadow of a doubt" help to convey further the level of behavior intended. In some instances this may border on faith, in the sense of it being a firm emotional acceptance of a belief upon admittedly nonrational grounds. Loyalty to a position, group, or cause would also be classified here.

The person who displays behavior at this level is clearly perceived as holding the value. He acts to further the thing valued in some way, to extend the possibility of his

developing it, to deepen his involvement with it and with the things representing it. He tries to convince others and seeks converts to his cause. There is a tension here which needs to be satisfied; action is the result of an aroused need or drive. There is a real motivation to act out the behavior.

> Devotion to those ideas and ideals which are the foundations of democracy.
>
> Faith in the power of reason and in methods of experiment and discussion.

4.0 Organization

As the learner successively internalizes values, he encounters situations for which more than one value is relevant. Thus necessity arises for (a) the organization of the values into a system, (b) the determination of the interrelationships among them, and (c) the establishment of the dominant and pervasive ones. Such a system is built gradually, subject to change as new values are incorporated. This category is intended as the proper classification for objectives which describe the beginnings of the building of a value system. It is subdivided into two levels, since a prerequisite to interrelating is the conceptualization of the value in a form which permits organization. Conceptualization forms the first subdivision in the organization process, Organization of a value system the second.

While the order of the two subcategories seems appropriate enough with reference to one another, it is not so certain that 4.1 Conceptualization of a value is properly placed as the next level above 3.3 Commitment. Conceptualization undoubtedly begins at an earlier level for some objectives. Like 2.3 Satisfaction in response, it is doubtful that a single completely satisfactory location for this category can be found. Positioning it before 4.2 Organization of a value system appropriately indicates a prerequisite of such a system. It also calls attention to a component of affective growth that occurs at least by this point on the continuum but may begin earlier.

4.1 Conceptualization of a Value

In the previous category, 3.0 Valuing, we noted that consistency and stability are integral characteristics of the particular value or belief. At this level (4.1) the quality of abstraction or conceptualization is added. This permits the

individual to see how the value relates to those that he already holds or to new ones that he is coming to hold.

Conceptualization will be abstract, and in this sense it will be symbolic. But the symbols need not be verbal symbols. Whether conceptualization first appears at this point on the affective continuum is a moot point, as noted above.

Attempts to identify the characteristics of an art object which he admires.

Forms judgments as to the responsibility of society for conserving human and material resources.

4.2 Organization of a Value System

Objectives properly classified here are those which require the learner to bring together a complex of values, possibly disparate values, and to bring these into an ordered relationship with one another. Ideally, the ordered relationship will be one which is harmonious and internally consistent. This is, of course, the goal of such objectives, which seek to have the student formulate a philosophy of life. In actuality, the integration may be something less than entirely harmonious. More likely the relationship is better described as a kind of dynamic equilibrium which is, in part, dependent upon those portions of the environment which are salient at any point in time. In many instances the organization of values may result in their synthesis into a new value or value complex of a higher order.

Weighs alternative social policies and practices against the standards of the public welfare rather than the advantage of specialized and narrow interest groups.

Develops a plan for regulating his rest in accordance with the demands of his activities.

5.0 Characterization by a Value or Value Complex

At this level of internalization the values already have a place in the individual's value hierarchy, are organized into some kind of internally consistent system, have controlled the behavior of the individual for a sufficient time that he has adapted to behaving this way; and an evocation of the behavior no longer arouses emotion or affect except when the individual is threatened or challenged.

The individual acts consistently in accordance with the values he has internalized at this level, and our concern is to indicate two things: (a) the generalization of this control to so much of the individual's behavior that he is described and characterized as a person by these pervasive controlling tendencies, and (b) the integration of these beliefs, ideas, and attitudes into a total philosophy or world view. These two aspects constitute the subcategories.

5.1 Generalized Set

The generalized set is that which gives an internal consistency to the system of attitudes and values at any particular moment. It is selective responding at a very high level. It is sometimes spoken of as a determining tendency, an orientation toward phenomena, or a predisposition to act in a certain way. The generalized set is a response to highly generalized phenomena. It is a persistent and consistent response to a family of related situations or objects. It may often be an unconscious set which guides action without conscious forethought. The generalized set may be thought of as closely related to the idea of an attitude cluster, where the commonality is based on behavioral characteristics rather than the subject or object of the attitude. A generalized set is a basic orientation which enables the individual to reduce and order the complex world about him and to act consistently and effectively in it.

> Readiness to revise judgments and to change behavior in the light of evidence.
>
> Judges problems and issues in terms of situations, issues, purposes, and consequences involved rather than in terms of fixed, dogmatic precepts or emotionally wishful thinking.

5.2 Characterization

This, the peak of the internalization process, includes those objectives which are broadest with respect both to the phenomena covered and to the range of behavior which they comprise. Thus, here are found those objectives which concern one's view of the universe, one's philosophy of life, one's Weltanschauung--a value system having as its object the whole of what is known or knowable.

Objectives categorized here are more than generalized sets in the sense that they involve a greater inclusiveness and, within the group of attitudes, behaviors, beliefs, or ideas, an emphasis on internal consistency. Though this internal consistency may not always be exhibited behaviorally by the students toward whom the objective is directed, since we are categorizing teachers' objectives, this consistency feature will always be a component of Characterization objectives.

As the title of the category implies, these objectives are so encompassing that they tend to characterize the individual almost completely.

> Develops for regulation of one's personal and civic life a code of behavior based on ethical principles consistent with democratic ideals.
>
> Develops a consistent philosophy of life.

APPENDIX 5

ABSTRACT OF

A Descriptive and Comparative Study of the Instructional Objectives of Teachers of Chemistry, English, French, Geography, History and Mathematics at Grade Twelve Level in English-Speaking High Schools of the Ottawa Board of Education

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A Descriptive and Comparative Study of the Instructional Objectives of Teachers of Chemistry, English, French Geography, History and Mathematics at Grade Twelve Level in English-Speaking High Schools of the Ottawa Board of Education[1]

The purpose of the study was to provide cogent evidence that the major teaching subjects in Ottawa English-speaking high schools encompassed the kinds of learning experiences which educationists regard as desirable characteristics of secondary school education. To provide relevant information on which a judgment could be based teachers identified the instructional objectives which they regarded as appropriate to the courses they taught, the objectives they included in their teaching programs, and the objectives with which they associated evaluation of related student performance. Basically, the study investigated the degree of correspondence between the actual situation at the instructional level and the following three propositions:

> The instructional objectives judged appropriate by a clear majority of the grade twelve teachers of each of the six principal teaching subjects correspond closely to the objectives included in their teaching programs, and to those regarding which they evaluate related student performance.

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1 Desmond J. Connelly, doctoral thesis presented to the School of Graduate Studies of the University of Ottawa, Ontario, February 1972, xvi-276 p.

The instructional objectives being aimed at by a clear majority of the grade twelve teachers of each of the six principal teaching subjects are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

The instructional objectives being aimed at by a clear majority of the grade twelve teachers of all of the six principal teaching subjects taken as a whole are classifiable into the eleven levels of the Bloom-Krathwohl taxonomies of cognitive and affective behavior.

Grade twelve teachers of chemistry, English, French, geography, history and mathematics in English-speaking high schools of the Ottawa Board of Education constituted the population from which data were obtained. The objectives identified by teachers were classified in accordance with the two domains of the Bloom-Krathwohl taxonomies of educational objectives, and the major emphases of the objectives were compared with the kinds of learning experiences that educationists regard as highly desirable in secondary schools.

Although there was evidence that teachers were favorably disposed toward a comprehensive range of learning outcomes, it was concluded that the three basic propositions of the study were not in accord with the objectives operationalized at the instructional level.

Recommendations were made about further research to determine the applicability of the findings beyond the teachers, subjects and grade level involved in this study. Guidance to teachers about the availability and use of

evaluation procedures, the setting up of model subject departments in high schools throughout the city of Ottawa, and matters to be included in the education of teachers-in-training were also included in the recommendations.