

Cognitive Levels of Teacher Objectives and Oral Classroom Questions for Curriculum Guide Users and Non-users

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THE teaching process is highly complex and requires decision making at many points. In making a variety of decisions, many teachers are virtually autonomous. It is in the American tradition, however, that schools and therefore teachers operate under local control. Such governing bodies as school boards attempt to influence teachers' decisions through the distribution of curriculum guides which presumably will be implemented.

While it has been assumed that curriculum guides affect teacher decisions, research suggests that many teachers do not use the guides. Edwards (3) found that only 25 percent of the teachers in a given school system perceived themselves as using curriculum guides. What can be said about this 25 percent who use curriculum guides; how do they differ from the other 75 percent?

Past research into the differences between teachers who use curriculum guides and those who do not has focused on factors relating to teacher background or personality. It has been suggested, for example, that teachers who possess innovative characteristics tend not to use curriculum guides (6). Although it is commonly so assumed, McLimans found that inexperienced teachers do not necessarily use curriculum guides more than experienced teachers, nor is involvement in preparing the guide an accurate indicator of use (6).

A crucial area regarding use of the curriculum guide that has received little attention is that of possible differences in teaching

behavior of those who use curriculum guides and those who do not. This study examined two aspects of teaching behavior: written instructional objectives, an element of pre-active teaching behavior; and teachers' oral classroom questions, an element of interactive teaching behavior (4). These factors were analyzed according to cognitive levels, the levels of cognition they attempted to elicit in the learners. The tool for analysis was Bloom's *Taxonomy of Educational Objectives, Handbook I: Cognitive Domain* (1).

Two major null hypotheses were tested:

1. There is no difference in the cognitive levels of objectives found in teachers' written plans, according to Bloom's cognitive taxonomy, between teachers who perceive themselves as using the social studies curriculum guide to a great extent (Users) and those who perceive themselves as not using the social studies curriculum guide (Non-users).

2. There is no difference in the cognitive levels of teachers' oral questions, according to Bloom's cognitive taxonomy, between Users and Non-users.

Procedure

All public school teachers of grades four through six in a Midwestern city of more than 165,000 were invited to participate in the study. Twenty-two teachers from 13

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	Group	Total Years	Mean	S.D.	d.f.	t
Age	Non-users	334.0	27.83	4.94	20	1.20
	Users	335.0	33.50	12.85		
Years of Teaching	Non-users	59.5	4.95	3.30	20	1.20
	Users	71.5	7.15	4.66		
Years of Teaching in Present System	Users	41.0	3.40	2.45	20	1.14
	Non-users	56.0	5.60	4.26		
Years of Teaching at Present Grade	Users	47.0	3.92	2.28	20	.90
	Non-users	51.5	5.15	3.55		

Table 1. T-tests on Age, Years of Teaching, Years of Teaching in Present System, and Years of Teaching at Present Grade: 10 Users and 12 Non-users

schools volunteered. These schools were both large and small and represented all socio-economic areas of the city.

Once the participants had volunteered, they responded to a questionnaire designed to ascertain their use of the locally produced social studies curriculum guide. Possible responses indicating the extent of use were "quite a bit," "somewhat," "very little," or "not at all." Those responding in the first two categories were classified as Users while those responding in the last two categories were classified as Non-users. Ten participants were Users and twelve were Non-users.

All participants had at least a baccalaureate degree. The majority of teachers in both groups were women and at least half of the participants in both groups taught sixth grade. Several additional personal factors were examined to determine whether Users and Non-users differed significantly on these measures. The t-test was used to test the null hypotheses that there was no difference between the two groups on the measures of age, years of teaching, years of teaching in the present system, and years of teaching at the present grade. As reported in Table 1, none of the null hypotheses was rejected at the minimal level of .05.

To collect data, participants were asked to record by audiotape three social studies sessions. They also were asked to submit lesson plans for the taped sessions. Lesson plans were not collected for every session, however. The study surveyed actual teacher practice; participants were not to feel that they *should* be writing plans and therefore

they were not questioned about their plans if none were submitted. Ten Users submitted 29 taped sessions and 23 lesson plans; 12 Non-users submitted 30 taped sessions and 20 lesson plans.

The data were coded by three coders working independently using a system based on Bloom's *Taxonomy of Educational Objectives. Handbook I: Cognitive Domain* (1). The six major categories of this hierarchy of thinking skills are Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation.

While the taxonomy was used intact for coding objectives, definitions of the levels were translated into language more appropriate for coding questions. Following are the definitions of the levels utilized in coding questions:

I. *Knowledge*: the student recalls or recognizes such types of information as facts, definitions, generalizations, values, and skills.

II. *Comprehension*: the student understands an idea and can make use of it without necessarily relating it to other ideas or seeing its fullest implications.

A. *Translation*: the student changes information into a different symbolic form or language.

B. *Interpretation*: the student explains or summarizes an idea.

C. *Extrapolation*: the student determines implications, predictions, consequences, etc., according to conditions set forth or facts given.

III. *Application*: the student selects and

	I	II	III	IV	V	VI	Non-Taxonomic Behavior	Facts, No Behavior
15 Users' Plans	17	16	3	7	1	1	11	0
14 Non-users' Plans	12	7	4	12	3	9	14	4

Table 2. Total Objectives in Plans Containing at Least Some Objectives Written in Taxonomic Language: 15 Users' Plans and 14 Non-users' Plans

uses appropriate abstractions in concrete situations without detailed instructions.

IV. *Analysis*: the student breaks down an idea into its constituent parts so that any or all of these factors can be identified: (1) the elements of the idea, (2) the interrelations among the elements, (3) the organizing principle of the idea.

V. *Synthesis*: the student puts elements and parts together so as to form a whole that is new to him.

VI. *Evaluation*: the student makes a value judgment based on criteria that are either established by the student or given to him.

In addition, supplementary categories were developed for coding questions. The coders coded all questions and thus provision was made for several types of questions not designed to elicit a cognitive response. Two categories were borrowed from Davis and Tinsley (2):

Affectivity: the student responds with a statement of feeling, emotion, or opinion without a standard of appraisal.

Procedure: the student responds to questions dealing with classroom organization, student behavior, or instructional management.

A third category was developed specifically for this study:

Clarification: the student describes something that took place when the questioner was

not present or he enlarges or elucidates a previous answer.

Reliability of the coders was calculated by using the formula $r = \frac{X}{Y}$, where X = the number of observer agreements and Y = the total number of observations made (5). The three-way interjudge reliability of the coders was 65 percent to 68 percent; intra-judge reliability varied from 90 percent to 95 percent.

Although all objectives and questions were categorized, statistical analysis of the data involved only the six cognitive levels; these levels were examined for Users and Non-users through application of the t-test.

Results

Objectives. It was not possible readily to translate all objectives into taxonomic language, and therefore some plans were not usable for this phase of the analysis. Further, of the 15 Users' plans and 14 Non-users' plans that contained at least some objectives classifiable according to the taxonomy, not all the objectives in those plans could be classified taxonomically. The objectives in these plans are summarized in Table 2.

Objectives categorized taxonomically were further studied. So few objectives were formulated at three levels that these levels

	Group	Number of Objectives	Mean	S.D.	d.f.	t
Knowledge (I)	Users	17	1.13	.90	20	.18
	Non-users	12	.92	1.03		
Comprehension (II)	Users	16	1.07	1.59	20	1.26
	Non-users	7	.54	.25		
Analysis (IV)	Users	7	.50	.81	20	.18
	Non-users	12	.90	.45		
Levels Three through Six	Users	12	.80	1.20	20	1.33
	Non-users	28	2.20	3.74		

Table 3. T-tests on Objectives by Cognitive Taxonomic Levels: 10 Users and 12 Non-users

Category	Group	Number in Category	Mean	S.D.	d.f.	t
Minutes Per Session	Users	696	24.0	9.17	20	2.06
	Non-users	857	28.5	7.14		
Rate of Total Questions	Users	74.2	2.6	1.46	20	1.43
	Non-users	64.4	2.1	1.00		
Rate of Cognitive Questions	Users	55.9	1.9	1.20	20	.80
	Non-users	49.8	1.7	.87		

Table 4. T-tests on Minutes Per Session, Rate of Total Questions, and Rate of Cognitive Questions: 10 Users and 12 Non-users

were not examined separately. Sub-null hypotheses were formulated, however, to test the differences for Users and Non-users in objectives at Levels One, Two, Four, and Three through Six. As Table 3 reports, t-tests applied at these levels yielded no significant t values at the minimal level of .05. Thus, the first major null hypothesis of the study was not rejected.

Questions. Although the maximum length of any tape-recorded social studies session was determined by the length of the tape (approximately 40 minutes), no minimal time was established. Therefore, differences in the length of sessions and the rates of total and cognitive questions were examined. As reported in Table 4, null hypotheses that stated that no differences existed in the length of sessions or rate of questions were not rejected.

T-tests were utilized to test sub-null hypotheses that no differences existed in the number of questions at specific taxonomic levels. Level Three was not tested individu-

ally because so few questions occurred at that level; Levels Three through Six were tested as an entity, however. As reported in Table 5, no significant t values were identified. Thus, the second major null hypothesis of this study was not rejected.

Conclusions

The data from this study did not cause rejection of the two major null hypotheses. Teachers who used curriculum guides wrote instructional objectives and asked classroom questions at cognitive levels that did not differ significantly from those employed by teachers who did not use the guides.

It should be noted, however, that Non-users tended to *write more objectives* at the four higher cognitive levels than Users. In contrast, Users tended to *ask more questions* at the four higher levels than Non-users. Although this tendency was not statistically significant, it could be hypothesized that if use or non-use of curriculum guides is related

Level	Group	Number of Questions	Mean	S.D.	d.f.	t
Knowledge (I)	Users	831	28.70	26.37	20	.06
	Non-users	848	28.30	22.14		
Comprehension (II)	Users	473	16.30	14.05	20	.63
	Non-users	439	14.60	9.65		
Analysis (IV)	Users	45	1.60	5.92	20	.71
	Non-users	25	.80	1.09		
Synthesis (V)	Users	10	.34	.61	20	.50
	Non-users	8	.27	.33		
Evaluation (VI)	Users	25	.86	3.60	20	.34
	Non-users	18	.60	1.83		
Levels Three through Six	Users	93	3.20	4.30	20	1.72
	Non-users	52	1.80	2.52		

Table 5. T-tests on Questions at Cognitive Taxonomic Levels: 10 Users and 12 Non-users

to teaching behavior, more consistency in the use of higher cognitive levels in writing objectives and in asking questions could be expected. Further study in this area may serve to elucidate this situation.

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