Technical Report 5

IEPs and Standards: What They Say for Students with Disabilities

National Center on Educational Outcomes

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Abstract

Student achievement is measured against national, state, and local standards. As new standards are developed, new descriptions of how students are faring will be presented. Students with disabilities are to be included in these assessment efforts. To describe the likely performance of students with disabilities on such assessments, we compared the content of the IEPs of 76 students with mild disabilities to nationally and locally defined standards for mathematics. The content of the NAEP proficiency levels, local standards, and IEPs were categorized using a taxonomy with the following dimensions: Level of Mastery, Nature of the Material, and Operations. Descriptive analyses suggest a widening of the gap between what students with disabilities are taught and the assessments with which they are tested. Implications for actions by the special education and standards-setting communities are discussed.

IEPs and Standards: What They Say for Students with Disabilities

The individualized education plan (IEP) is the cornerstone of special education services that are provided to nearly 5 million students in America's schools. The IEP itself is seen by some as the primary safeguard of the rights guaranteed by the Individuals with Disabilities Education Act (IDEA) (Ysseldyke & Algozzine, 1990). Taken together, the five mandatory sections of the IEP (present performance, annual goals, statement of placement and services, timelines of service, objective criteria for evaluation) amount to a delineation of the standards of progress for each student receiving special education services.

While this individualized approach to education is applauded by many as an ideal approach for all students (see OTA, 1992), it has not been the answer to educational service provision in any sense. Edgar (1987) contended that many IEPs focus on the wrong issues for students with disabilities. In his view, there often is too much emphasis on the achievement of success in the general education curriculum at the expense of real-world orientations. Lynch and Beare (1990), who examined the IEPs of students with mental retardation and students with behavioral disorders, found that most objectives focused on academic remediation and ignored life skills, social skills, and learning strategies. They also confirmed that what was written on the students' IEPs had only a vague relationship to the activities of the students' instructional day. Such conclusions lend support to the thesis presented some time ago by Gerardi, Grohe, Benedict, and Coolidge (1984) that the IEP was little more than extra paperwork and wasted time. Smith (1990) termed the IEP a "document of unproven validity and impact" (p. 12).

Still, the IEP is seen by many as the best available written record of what is expected of the student, whether in general or special education settings. Even if the IEP is not closely linked with *daily* programming, it is a formalization of the student's overall instructional framework. If written appropriately, it provides a vehicle for the comparison of a student's status at the beginning of services with the student's status after receiving instructional programs designed to assist in the achievement of annual goals and objectives. In this way, the IEP is seen as delineating a set of standards for an individual's progress.

More often, Standards are statements of criteria against which larger-scale comparisons can be made. They are often established for the purpose of changing an existing situation (Ysseldyke, Thurlow, & Shriner, 1992). Standards are used as the basis for defining performance goals, criteria, and objectives. Standard-setting activities have taken off at a rapid pace in most curricular areas, but none more quickly than in the field of mathematics. Many local, state, and national groups are at different stages in their own standards-setting processes. For example, the National Council of Teachers of Mathematics (NCTM) has already published its Curriculum and Evaluation Standards (National Council of Teachers of Mathematics, 1989), and there are at least 42 states currently rewriting or realigning their mathematics curriculum frameworks to match the NCTM *Standards* (Blank & Dalkilic, 1992).

Regardless of the intent of standards-setting groups, the major follow-up activity in the process is the assessment of students for the purpose of establishing the extent to which individuals or classes of students are achieving desired standards or performance levels. Most often, the National Assessment of Educational Progress (NAEP) is the measure of choice for addressing this issue on a national scale. In recent years, with the push for reform, the NAEP has been revised to mirror the curricular emphases thought to be most important for American students to attain. There is a concerted effort to make the NAEP more reflective of the NCTM *Standards*. The National Assessment Governing Board (NAGB) describes this work as:

> An attempt to move the NAEP mathematics framework closer to the context of the NCTM Curriculum and Evaluation Standards . . . . The framework and item specifications . . . . reflect a much more holistic and integrated views [sic] of school mathematics . . . . As such, the framework moves NAEP closer to the *ideal* described in the NCTM Standards. (National Assessment Governing Board, 1992, p. 8, emphasis added).

Obviously, if one wishes to examine students' proficiency in mathematics on the national level, the NAEP system will be the index of change toward national standards.

Proficiency levels were established recently for NAEP, so that student performance could be described and categorized through a common metric that will be useful for tracing growth in achievement in the content areas across time (National Assessment Governing Board, 1991).

Table 1 is a description of the content areas and two proficiency levels used by the 1992 NAEP for mathematics. There is a third proficiency level (Advanced) that is not shown. Each grade level has a scale on which skills are cumulative across proficiency levels. Descriptions of the content areas and proficiency levels will be different for the 1994 NAEP, and in final form will match closely the wording of the NCTM *Standards*.

State departments of education and local school districts also set standards for student performance in most curricular areas. In contrast to the visionary nature of the NCTM *Standards*, these efforts more often include specific criterion objectives that follow the mission, goals, or standards statements on which they are based. Local documents sometimes take the form of course descriptions or scope and sequence charts. Local standards for mathematics also are being revised to match more closely the direction proposed by the NCTM *Standards*, though the extent to which these activities have progressed is less certain. Upton, Landers, and Kroll (1992) surveyed mathematics teachers about the use of the standards in their work. These authors suggest that local districts are following the leads of their state departments, but that classroom mathematics teachers are not as advanced in their adoption of proposed standards as might be expected. They conclude that large percentages of teachers do not feel prepared to implement the *Standards*.

It seems, then, that standards of performance surround the educational experiences of students in schools. Special education students have personal standards delineated in their IEPs and these students are part of their local districts. The state and national reformers are using inclusive language that says students with disabilities are part of their agendas. By law, students with disabilities are to be included in the educational system to the maximum extent possible. But, the degree to which they are included in reforms of the system is a concern to some observers. Anderson (1992) has suggested that most, if not all, current reform-oriented activities are geared toward only 90% of students in U.S. schools because they do *not* consider students with disabilities. In his view, the 10% of the school population receiving special education services is simply overlooked by reform efforts. A current question revolves around the degree of correspondence among these "levels," in terms of the standards to which students are being held: Is the cornerstone of special education services (the IEP) cut from the same vein as the cornerstones of the reform movement (new standards and assessments)?

The purpose of this paper is to describe the degree to which the IEPs of students with disabilities match the established standards and statements of expected performance in the content area of mathematics. An examination of the NAEP proficiency levels is presented to illustrate student achievement relative to national standards. We also examined local district objectives and their relationship to student IEPs, since teachers are most likely to have access to local documents for reference in IEP development (L. Lewis, personal communication, 1992).

Method

Subject IEPs

The mathematics goals and objectives sections of the individual education plans (IEPs) of 76 students with disabilities were examined. Student IEPs were sampled from a large Southwestern urban-suburban district and a small Eastern rural district.

District 1, located in the Southwest, is an urban-suburban district. It has 92,000 children in grades kindergarten through 12. Approximately eight percent (7600) of these children are in the special education program. The fourth grade consists of 6,966 students, and the eighth grade consists of 5,686 students. Ethnic breakdown provided by the district is 47.3% Caucasian, 43.0% Hispanic, 4.7% Native American, 3.2% African American, and 1.8% Asian.

District 2 is a mid-Atlantic rural district, with a total school population of 4300 students in grades K-12. There are 342 students enrolled in fourth grade. Approximately nine percent of all enrolled students receive special education services. No demographic data were obtained, although it was reported that the vast majority of students (over 90%) were Caucasian.

The two districts were requested to send 25 math IEPs each from a random sample of special education students in both the 4th and 8th grades for a total of 50 IEPs per district. The final sample conprised 53 fourth grade and 23 eighth grade mathematics IEPs. District 1 provided 31 fourth grade IEPs and 23 eighth grade IEPs. District 2 provided 22 fourth grade IEPs.

Examination items for the NAEP were taken from The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States (National Center for Education Statistics, 1991). Twenty-one items representing levels 200-300 (Basic and Proficient student performance) were included in this investigation. Items from the Advanced level of performance (level 350) were not used because no fourth-grade students in the NAEP sample achieved at or above level 300, and only a few eighth grade students (0.3 percent) reached level 350 (National Center for Education Statistics, 1991) (refer to Table 1).

District Curriculum and Goals

Each school district from which student IEPs were sampled also sent its course goals, objectives, and expectations for elementary and middle school mathematics. Course objectives for the grade levels of interest were available from both districts. District 2 provided a more detailed skills acquisition plan for fourth grade mathematics.

Procedure

The mathematics goals and objectives from the sample IEP and district guidelines and the NAEP sample items were categorized and coded according to a model initially prepared by Kuhs, Schmidt, Porter, Floden, Freeman, and Schwille (1979) and adapted by Shriner and Salvia (1988). This model, shown in Figure 1, incorporates three dimensions: *Level of Mastery, Nature of Material,* and *Operations*. The first dimension, *Mastery*, refers to the type of process required and is based on Wilson's (1971) adaptation of Bloom's Taxonomy of Educational Objectives (Bloom, 1956). Bloom included basic computational skills within the knowledge dimension of his taxonomy, whereas Wilson distinguished between computation and knowledge of facts and specifics. Table 2 is a summary of the *Mastery Dimension* and terms associated with each process category.

The dimensions of *Nature of Material* and *Operations* were used in the form in which they appeared in Shriner and Salvia (1988). *Material* refers to the content of the problem (e.g.,

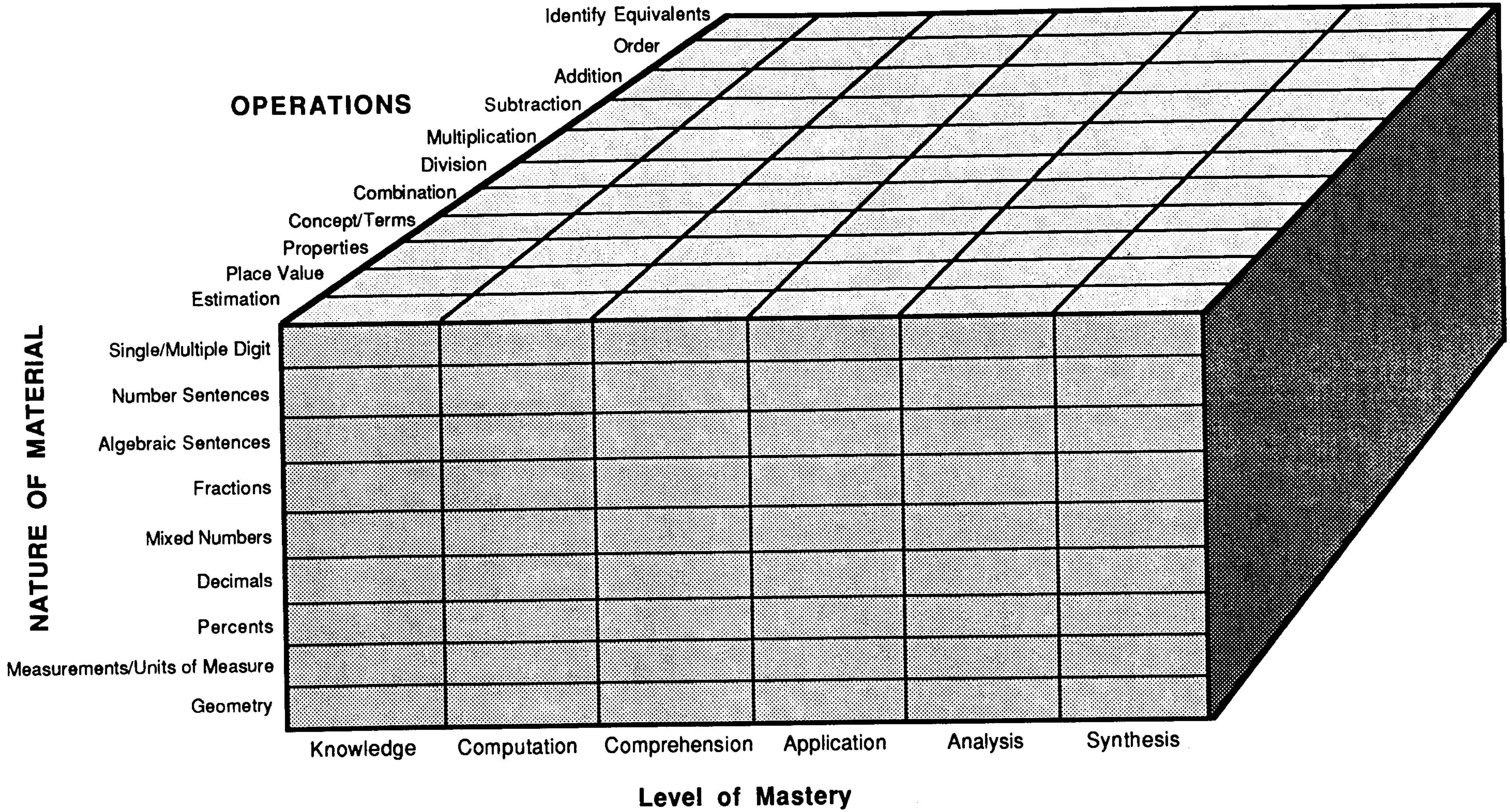
Table 1

National Assessment of Educational Progress (NAEP) Proficiency Levels

	NAEP Proficiency Levels Grade 4	 Grade 8
BASIC: Partial mastery of knowledge and skills	• one-step problems with whole numbers • use of concrete objects to explain mathematical procedures • estimation/measurement • identification of simple geometric figures • read simple graphs	• one and two-step problems with all operations for both whole numbers and decimals • place value/order operations • calculate perimeter/area of rectangular figures • make conversions in units of measurement • use geometric terms/identify geometric figures • solve simple linear equations with whole numbers
PROFICIENT: Solid academic performance	• solve wide variety of mathematical problems • use patterns/relationships to analyze mathematical situations • find and use relevant information for problem solving • facility with whole number operations/computations • identify geometric figures • collect, interpret, display data	• solve problems with decimals/fractions/proportions • compute with integers • classify geometric figures based on properties • read, interpret, and construct line and circle graphs • show understanding of probability • translate verbal problems into algebraic equations • identify algebraic expressions representing linear situations

NAEP Content Areas: Numbers and operations, measurement, geometry, data analysis and probability, algebra and functions.

Figure 1



The Nature of Material and Operation categories of "Other" and "Not Specified" shown in Tables 2 and 3 are not included in this figure.

Table 2

Descriptive Verbs for the Levels of Mastery

Level of Mastery	Acceptable Verbs
Knowledge	Define, distinguish, identify, recall, recognize
Computation	Add, subtract, multiply, divide
Comprehension	Conclude, demonstrate, differentiate, draw, explain, give in your own words, illustrate, interpret, predict, rearrange, reorder, rephrase, represent, restate, transfer, translate
Application	Apply, classify, develop, employ, generalize, organize, relate, restructure, transfer, use
Analysis	Analyze, categorize, compare, contrast, deduce, detect
Synthesis	Combine, constitute, derive, document, formulate, modify, organize, originate, produce, relate, specify, synthesize, tell, transmit, write
Evaluation	Appraise, argue, assess, decide, evaluate, judge, standardize, validate

Note: Information in table is based on: Glover, J. A., & Bruning, R. H. (1987). Educational psychology: Principles and applications (2nd ed). Boston: Little, Brown, & Company.

single digits, number of sentences, decimals, etc.). *Operations* refers to the arithmetic operation required in the problem (e.g., identifying equivalents, addition, multiplying, etc.).

Objectives from the IEPs and district objectives and guidelines were given a three term code from the dimensions of the taxonomy. Each NAEP sample item was categorized the same way. For example, the objective "Multiply any two-digit number by a one-digit number with and without regrouping." was coded: Computation, single and multiple digits, multiplication. The NAEP sample item, "What is the value of n+5 when n=3?" was coded: application, number sentences, addition.

Frequency distributions were developed to reflect the extent to which NAEP items and district and IEP objectives fit with the three dimensions of the classification taxonomy. Comparisons could be made, then, of the degree of match between student IEPs and district objectives/expectancies, and student IEPs and NAEP content. Use of the taxonomy as an external framework provided a common point of reference for these comparisons.

Reliability of Classifications

Reliability of the classifications was estimated by computing interrater agreement on each dimension (*Mastery, Material,* and *Operations*) for 16% of the objectives and sample items. The independent raters were graduate assistants who had been trained to use the taxonomic classification system, and the first author. Percentages of exact agreement on each dimension were calcuated (Kazdin, 1982). Agreement across dimensions was 81% (*Mastery*=90%, *Material*=82%, *Operations*=76%).

Results and Discussion

For ease of presentation, results are shown by grade level and by each dimension of the model. The number of items or objectives and percentages that fit within each category of the model dimension are shown (see Figure 1).

Grade 4

Level of Mastery. Table 3 shows the distribution of the NAEP items, district objectives and student IEPs for Grade 4 Level of *Mastery*. NAEP sample items are evenly distributed across *Mastery* categories, with some emphasis on comprehension and application processes. District objectives are more concentrated on lower level categories, although District 1 includes more comprehension-level processes.

Most of the objectives from District 2 are knowledge and computation-oriented. Over 75% of student IEP objectives in both schools are written at the knowledge and/or computation levels. It should be noted that 6 objectives (4%) from School 1 and 15 objectives (13%) from School 2 could not be analyzed because of a lack of specificity in the objective statements. Examples of these nonspecific objectives include "demonstration of math skills," "progress through the listed skills," and "practical application in real life."

There are mismatches in the distributions on the *Level of Mastery* dimension between NAEP items and district objectives and between district objectives and IEP objectives. Straight computation was required in only one (7%) of the sampled NAEP items, whereas the student's IEPs were heavily (at least 40%) weighted in this category. District goals and objectives tended to be more balanced across the dimension than student IEPs, but still tended to favor lower-order skills. Application (problem solving) skills were avoided by both district and student IEP objectives.

Nature of Material. The frequency distributions for the items and objectives in the categories of *Nature of Material* are shown in Table 4. Single and multiple digit material was most common in all examined sources. Measurement and units of measurement (e.g., time) also were covered by all sources, although NAEP included only one item. The percentages of objectives that did not fit into any category because they lacked specificity were 24% in District 1, 29% in School 1 and 14% in School 2. Despite the emphasis on single/multiple digits, *Nature of Material* categories were more evenly distributed for NAEP items and district objectives than they were for student IEPs. In the remaining categories, the IEPs had several "holes" in

Table 3

Categories of Mastery Level in Expected Math Performance for Grade 4

Mastery Level	NAEP [a]		District 1		District 2		School 1		School 2	
	n	%	n	%	n	%	n	%	n	%
Knowledge	3	21	4	14	41	44	6	4	25	22
Computation	1	7	7	24	37	40	109	75	50	43
Comprehension	4	29	15	52	9	10	5	3	20	17
Application	5	36	3	10	6	7	19	13	5	4
Synthesis	1	7	0	0	0	0	0	0	0	0
Not Specified	6	4	15	13	0	0	0	0	0	0
Total	14		29		93		145		115	

[a]Based on the sample items of level 200 and 250 in NCES (1991).

Table 4

Categories of Nature of Materials in Expected Math Performance for Grade 4

Nature of Materials	NAEP [a]		District 1		District 2		School		School 2	
	n	%	n	%	n	%	n	%	n	%
Single/Multiple Digit	4	29	12	41	40	43	79	55	67	57
Number Sentences	3	3	0	0	0	0	0	0	0	0
Algebraic Sentences	1	7	0	0	0	0	0	0	0	0
Fractions	3	10	7	8	7	5	0	0	0	0
Mixed Numbers	1	7	2	2	0	0	0	0	0	0
Decimals	2	14	1	3	8	9	0	0	0	0
Percents	0	0	0	0	0	0	0	0	0	0
Measurements/ Units of Measure	1	7	3	10	15	17	6	4	25	22
Geometry	3	21	1	3	11	12	0	0	0	0
Other	2	14	2	7	7	8	11	8	7	6
Not Specified	0	0	7	24	42	29	16	14	0	0
Total	14		29		93		145		115	

[a]Based on the sample items of level 200 and 250 in NCES (1991).

coverage. None of the objectives from either school dealt with algebraic sentences, decimals, percents, or geometry. Only School 1 IEPs covered fractional numbers (5%). The main point here is that NAEP items and district objectives encourage coverage of a wider variety of material and problems while IEPs heavily stress simple types of work and make no mention of several important topics.

Operations. Table 5 contains the breakdown of categories for operations of each source. NAEP items, district, and student IEP objectives all emphasize the categories of identifying equivalents and computational skills. Seventeen objectives from School 1 and 15 from School 2 belonged not to a single category, but to a conglomerate category that was coded as "other." Examples of these include "identify appropriate operation and computation for written problems," and "perform basic, real-life situational operations." Many IEP objectives did not include a complete description of the operations that were expected or required, and were subsequently coded as "not specified."

Of note on the *Operations* dimension is the treatment of mathematical and algebraic properties by NAEP items and of properties, place value, and estimation by district objectives (albeit minor coverage). However, student IEPs gave no specific attention to these categories of operations.

Grade 8

Level of Mastery. The distributions of NAEP, district, and IEP objectives within Bloom's *Levels of Mastery* are shown in Table 6. NAEP sample items and district objectives covered all categories, both having fairly even distributions from lower to higher-order processes. In contrast, 81% of student IEP objectives addressed computation, while only 12% of the objectives addressed application and problem solving.

Nature of Material. Distributions on the *Nature of Material* dimension are shown in Table 7. Again, the NAEP sample items and district objectives had comparable coverages and problem types. Both contained single/multiple digits, algebraic sentences, and geometry. The student IEPs were aimed at familiarity with whole numbers, mixed fractions, decimals, and

Table 5

Categories of Operations in Expected Math Performance for Grade 4

Operations	NAEP[a]		District 1		District 2		School 1		School 2	
	n	%	n	%	n	%	n	%	n	%
Identify equivalents	3	21	5	17	26	28	6	4	22	19
Order	1	7	3	10	3	3	0	0	0	0
Addition	2	14	4	14	14	15	28	19	16	14
Subtraction	1	7	4	14	5	2	28	19	14	12
Multiplication	2	14	3	10	10	11	24	17	16	14
Division	2	14	4	14	10	12	22	15	7	6
Combination	1	7	1	1	5	4	0	0	0	0
Concept/Terms	1	3	13	14	5	4	9	8	0	0
Properties	2	14	3	10	1	1	0	0	0	0
Place value	1	1	4	4	0	0	0	0	0	0
Estimation	1	1	5	5	0	0	0	0	0	0
Other	17	12	15	13	0	0	0	0	0	0
Not specified	10	7	16	14	0	0	0	0	0	0
Total	14		29		92		145		115	

[a]Based on the sample items of level 200 and 250 in NCES (1991).

Table 6

Categories of Mastery Level in Expected Math Performance for Grade 8

Mastery Level	NAEP [a]		District 1		School 1	
	n	%	n	%	n	%
Knowledge	3	14	7	15	5	3
Computation	2	10	11	23	132	81
Comprehension	5	24	9	19	7	4
Application	8	38	19	40	19	12
Synthesis	3	14	1	2	0	0
Not Specified	1	1	0	0	0	0
Total	21		47		164	

[a]Based on the sample items from level 250 to 300 in NCES 1991.

Table 7

Categories of Nature of Material in Expected Math Performance for Grade 8

Nature of Materials	NAEP[a]		District 1		School 1	
	n	%	n	%	n	%
Single/Multiple Digit	6	29	7	15	31	19
Number Sentences	0	0	0	0	0	0
Algebraic Sentences	3	14	6	9	0	0
Fractions	1	5	4	4	8	5
Mixed Numbers	1	5	1	2	28	17
Decimals	3	14	33	20	0	0
Percents	2	4	24	15	0	0
Measurements/ Units of Measure	1	5	3	2	0	0
Geometry	4	19	7	15	0	0
Other	2	10	14	30	9	6
Not Specified	0	0	3	6	28	17
Total	21		47		164	

[a]Based on the sample items from level 250 to 300 in NCES 1991.

percents. These categories accounted for 71% of the objectives. None of the IEP objectives addressed algebraic sentences or geometry. The category of "other" includes several items listed as "integers" in the district standards. They were originally included in the single/multiple digit category, but removed because other district standards provided information that differentiated these categories. Twenty-eight IEP objectives (17%) could not be categorized.

Operations. Table 8 is a listing of the *Operations* distributions for eighth grade. There is fairly uniform coverage of topics across NAEP, the district objectives and student IEPs. However, NAEP does include several items dealing with mathematical properties (e.g., reciprocity) and the district objectives address concept development. Basic computation or a combination of operations accounted for 87% of the objectives found in the IEPs. Interestingly, none of the sources contained items dealing with place value or estimation.

Comparisons of Grades

Students with disabilities who receive special education services, by definition, are in need of academic remediation. Therefore, it may be more relevant to compare IEPs of Grade 8 students with the math items, objectives, and standards designed for students at lower grade levels. Even when the fourth grade district standards and NAEP sample items for grade 4 were compared with the 8th grade IEP objectives, the schism between the national and district expectancies and the IEP objectives is evident. Across the dimensions included in this examination, the eighth grade IEP objectives are relatively narrow, and limited primarily to basic computation skills. There is some attention given to mixed fractions and decimals on the eighth grade IEPs, as well as some coverage of combined, mutiple-step computation. Perhaps some of the objectives that were not coded because they lacked specificity might fit into some of the dimension categories. This trend toward generality of IEP objectives is itself somewhat disappointing. Well-written IEPs should be useful to any teacher who may read them, but statements such as "will perform skills up to level expected" provide almost no helpful planning information. The intent of the IEP to communicate an instructional plan is not fulfilled when the reader is left to guess what will be happening during instruction.

Table 8

Categories of Operations in Expected Math Performance for Grade 8

Operations	NAEP [a] n	NAEP [a] %	District 1 n	District 1 %	School 1 n	School 1 %
Identify equivalents	4	19	5	11	2	1
Order	1	5	2	4	0	0
Addition	2	10	4	9	31	19
Subtration	1	5	4	9	31	19
Multiplication	2	10	4	9	31	19
Division	4	19	4	9	31	19
Combination	3	14	14	30	18	11
Concept/Terms	6	13	0	0	0	0
Properties	4	19	0	0	0	0
Place value	0	0	0	0	0	0
Estimation	0	0	0	0	0	0
Other	4	9	1	1	0	0
Not specified	19	12	0	0	0	0
Total	21		29		164	

[a]Based on the sample items from level 250 to 300 in NCES 1991.

Summary and Conclusions

In this study we examined student IEP objectives, district objectives and standards, and sample items from NAEP for mathematics within the framework of a model useful in describing mathematics curricula and assessments. The model allowed for categorization of the *Level of Mastery* expected (Bloom's revised taxonomy), the *Nature of Material*, and the *Operations* required. In general we found that the NAEP sample items were distributed evenly across all three dimensions at both Grade 4 and Grade 8. For *Level of Mastery* there was some emphasis on the higher-order skills of comprehension and application (i.e., the processes of problem solving). The material covered by NAEP items included numbers, algebraic sentences, and geometric concepts. There were minimal gaps in NAEP operations since none of the items addressed place value concepts or estimation skills.

District objectives/standards were likely to emphasize the knowledge and computation categories of *Mastery* at Grade 4. However, District 1 strongly addressed application at Grade 8. Both districts included geometry in Grade 8 on the *Material* dimension, and had some treatment of place value and estimation in *Operations*.

Student IEPs from both schools addressed almost exclusively lower arithmetic skills on the *Mastery* dimension (knowledge and computation). Less than 15% of the objectives addressed application (problem solving) processes.

The IEPs also had more "holes" in their coverage of materials. None of the objectives at either grade level addressed number sentences, algebraic sentences, or geometry. Most objectives required students to perform the operations of addition, subtraction, multiplication, and/or division.

Limitations

Clearly, this study must be considered to be only a snapshot of the standards and expectations for the mathematics education of all students, including students with disabilities. IEPs and district standards were obtained from two locations, therefore the limited sample makes the results of this study quite specific. There is some evidence, however, that one need not examine a large sample of IEPs in order to ascertain the likely content of other IEPs from the population (Potter & Murkin, 1982). NAEP sample items were used because we were unable to obtain permission to examine a complete set of examination items. This sample may be an inaccurate representation of the NAEP exams, although the document from which the items were taken was intended to provide a description of the 1990 NAEP. Also, the taxonomy used to classify items may introduce inaccuracies in the description of the standards and IEPs. The *Mastery* dimension is based on an adaptation of Bloom's taxonomy, and the extent to which this alteration affects the accuracy of classifications is unknown.

Implications for Special Education

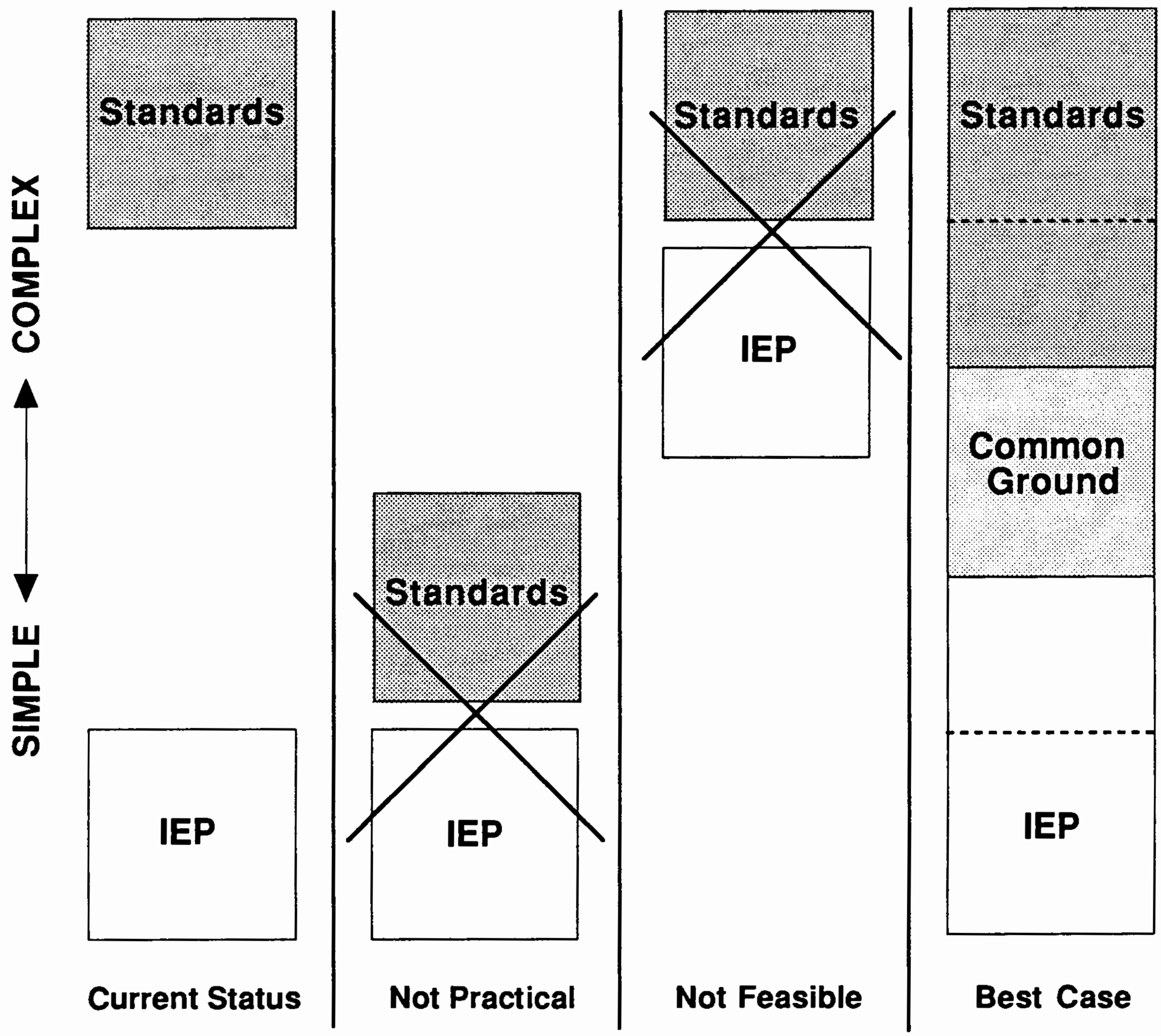
By the year 2000, all of America's students are supposed to be competent in the core subject area of mathematics, along with other areas. The goal is in place are for all students, including students with disabilities. It is important for us to examine how current educational practice looks in comparison to the standards and expectations that various groups have proposed. To this end, an examination of the plans for the education of students with disabilities who are receiving special services gives us some indication of how they might fare in assessments of progress toward the standards. To no one's surprise, we must conclude that if any of the students whose IEPs we examined reached all of his or her goals and objectives, he or she probably would receive a very disappointing score on the NAEP or on a test that closely matched the district objectives/standards. This statement assumes that the objectives are, indeed, appropriate for the student and that instruction follows the IEP. The latter point of congruence between the IEP and instruction is not always the case. Lynch and Beare (1990) and Schenck (1981) have demonstrated that minimal connections are, indeed, quite common.

There is evidence that the current mathematics instruction for students in general education does not match the recommendations of the National Council of Teachers of Mathematics (Upton et al., 1992). The NCTM Standards are the underlying framework for the design of NAEP mathematics exams, and are the guides that states and districts are using to revise their math objectives and curricula. Recognition of the challenges faced by classroom mathematics teachers in realizing their practices with the Standards, serves as a potentially discouraging signal to teachers of students with disabilities. The gap between standards and instructional practices for students with disabilities is likely rtro grow even wider in the future. The gap between these standards and the mathematics instruction for special education students is even wider.

But what if the math standards are wrong and all of their fallout efforts misguided? This point was raised by Chester Finn (1993), who called attention to the possibility that the NCTM standards are "ceaselessly cited as the example of par excellence of what national standards should look like" (p. 36). The educational community as a whole may be on a "lemming-like rush . . . . of a precipice" (p. 36). Standards for content and curriculum are followed by standards for the assessment of performance -- in this case multiple efforts are focused on performance or authentic assessments. However, the push for higher standards and newer assessments is not about doing things instead of knowing things. Work at the Center for Research on Evaluation, Standards, and Student Testing (CRESST) has demonstrated that students must have a substantial body of content knowledge in order to peform well on authentic assessments (Baker, 1992). The disappointing results of many performance assessments might be explained in terms of knowledge and factual deficits rather than process deficits. What is needed is a balance of strategies and approaches to mathematics education including both problem solving/critical thinking skills and direct instruction of knowledge and skills. It should not be an either/or proposition.

For special educators this situation can be represented by the existing and possible scenarios shown in Figure 2. Currently, the national emphasis is on more complex skills and concepts. State and districts standards are being rewritten to mirror this position. Individualized education plans and mathematics instruction are focusing on traditional skills and avoid the complexities of problem solving and abstract reasoning (left side of figure). It is unlikely, and probably not in the best interest of anyone, that standards will be defined in terms closer to those

Figure 2. The Status of Standards and IEP Objectives



of the IEP. It is also unlikely that student IEPs can or should be written in terms congruent to the principles espoused by the standards (middle portions).

The preferred state of practice (far right of figure) would be for writers of standards to consider their often used phraseology of all students to mean just that. The standards-setting enterprise must demonstrate how valued content and levels of performance can be extended to include all students. A document that begins with an inclusive mission statement should follow with inclusive proposals. This is not to say that standards should be lowered. High standards at all levels are beneficial to the entire system. Rather, issues of flexibility and accommodation must be addressed by the leaders (i.e., the standards-setters) because their work is being adopted as a prescription for change, even though their efforts are often called descriptive visions of desired practice. The leaders must demonstrate how the standards can have a positive impact on the educational programs of all students.

Special education teachers must also recognize that the students do need instruction in critical thinking and problem solving. It is a disservice to students to assume that computational fluency will prepare them to be responsible citizens. The latter half of Goal 3 goes beyond competence in core subjects to include the valued outcome that students "will learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment (National Education Goals Panel, 1991).

There is a need for special educators to prepare students to be problem solvers and critical thinkers. Teachers of students with disabilities must address a broader array of topics and skills than they appear to be covering. To this end, IEPs should be developed with an eye on both remediation of basic skills and development of new skills that will help the student meet the standards of his or her district, state, and nation. Students who are participants in their school should also participate in the assessments of the outcomes of schooling. We, as special educators, should give them every opportunity to play on the same field as their peers without disabilities. The greatest victories for all students, and for all of society, will be found in the common ground where standards and IEPs meet in the best service of students who are often forgotten when proposals for reform are translated into action plans of practice.

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