The skills that teachers should have to be effective partners in the development of better assessment practice are related to teachers' levels of classroom assessment training.

Classroom assessment has been identified as significant to successful teaching and learning and as one of the six core job functions of teachers (Gullickson, 1986; Rosenfeld, Thornton, & Skurnik, 1986; Smith, Silverman, & Borg, 1980). It has also been found that teachers can spend up to one third of their instructional time on assessment-related activities (Stiggins, 1987). Moreover, recognition of the importance of assessment for teachers is suggested by the inclusion of evaluation as a topic in the American Association of Colleges for Teacher Education's project on the needed knowledge base for the beginning teacher (Merwin, 1989), the National Education Association's (NEA) position that teachers need to test (1983), Shanker's (1985) position that a teacher's ability to assess pupil performance is critical to success, and the inclusion of diagnosis as one of the five skill components on the National Teacher Examination (Hufker, 1982).

The need for teacher competence in assessment is further suggested by research that has identified specific measurement skills (Schafer, 1991) to address each of the three types of assessments that are most common in today's classrooms (Airasian, 1991), and by the research of Stiggins, Conklin, and Bridgeford (1991), which used task analysis to identify six areas of competence teachers need to accurately assess a wide range of pupil learning.

These needs pertain primarily to teachers as they relate to daily classroom instructional activities and decisions, not to the pencil-and-paper standardized norm-referenced multiple choice tests that have long anchored statewide assessment programs. Those historical needs combined with the current trend toward alternative assessments (in statewide assessment programs) that will rely on teachers for the preparation of students for the assessments, and possibly for the actual administration and scoring, make them imperative for teacher competence in assessment now even stronger than it has been. The situation concerning teachers and their training in classroom assessment, while different from the past in some...
respects, has many similarities to it and the questions remain: "What should teachers know and be able to do in terms of classroom assessment?" "How will teachers' competence in classroom assessment be ensured?"

The Changing K-12 Assessment Scene

Improvement of American students' academic performance is considered essential if the country is to remain profitable and competitive in an international economy. For this to occur, high school students specifically need to be able to read, write, compute, speak, listen, study productively, reason, and work effectively with others (The College Board, 1984). There seems to be a clear imperative in society to significantly improve K-12 education, as demonstrated by the set of national educational goals that were the outcome of The National Governors' conference held in the fall of 1989 in Charlottesville, Virginia, and the number of governors and legislatures who have mandated or are in the process of mandating education reform in their states. Virtually all of these efforts incorporate assessment to document progress.

Pencil-and-paper standardized norm-referenced multiple choice tests have come under new criticism recently. Opponents of their use, along with claiming that those kinds of tests measure too narrow arrange of student abilities to be helpful and that their results cause misdirected changes in instructional strategies, have also claimed that results are often flawed because of selective suppression of lowest individual scores and breached security of test answers. Opponents of pencil-and-paper standardized norm-referenced multiple choice tests, who typically are also supporters of alternative assessments, feel that performance assessments will measure a much wider range of student abilities and will cause appropriately directed changes in instructional strategies, and that their results will be much less flawed because breached security of test "answers" of performance assessments is of little concern as compared to multiple choice test "answers." It is acknowledged that selective suppression of lowest individual scores could remain a problem, because this depends on those assessments are administered and their results reported (e.g., census administration versus sampling administration; "Wall-chart" reporting versus other reporting methods).

The following points of view about the use of standardized tests and the possible use of performance assessments seem to be representative of the discussion on the topic. Albert Shanker, president of the American Federation of Teachers, spoke in negative terms about the continued use of standardized tests, "Rather than rely on such flawed measures to judge school performance, schools should scrap standardized tests as they are now" (cited in Rothman, 1990). And perhaps Richard J. Shavelson, dean of the Graduate School of Education at the University of California at Santa Barbara, best expressed at least one important positive reason for the use of performance assessments when he stated. "If schools spend three or four weeks a year teaching to a performance based test, at least they will be teaching things they ought to be teaching in ways they ought to be teaching it" (in Rothman, 1990).

Nevertheless, as the discussion about the types of assessments to be used in the educational reform movement of the 1990s in America continues, there is a clear move toward the use of performance assessments and away from the use of standardized tests. Perhaps the strongest impetus for the movement away from standardized tests and toward the use of alternatives, including performance assessments, was made in the "Statement of Genuine Accountability" (Education Week, 1990) issued by a coalition of more than 35 education and civil rights groups. In that statement, organizations such as the American Federation of Teachers, the Council on Basic Education, the Institute for Learning and Teaching, the National Association of Elementary School Principals, and individuals including Howard Gardner of Harvard University and Asa Hilliard of Georgia State University exhorted the nation's governors to set a timetable for phasing out current standardized tests and replacing them with alternatives and to reduce their reliance on multiple choice tests as much and as soon as possible (Education Week, 1990).

Maryland is but one example of a state in the process of K-12 education reform. In 1989 a Governor's Commission on School Performance submitted its final report to the governor of Maryland. In addition to seven other recommendations that are designed to affect public education in Maryland, the report called for "the establishment of more comprehensive assessment systems at the state and local levels to identify excellence, to uncover problem areas, and to point the way toward improvement. The state should replace its current testing programs (Sondheim, 1989).

Maryland and other states, such as Connecticut, California, New York, Kentucky, and Vermont are attempting to make fundamental changes in K-12 education (Education Week, 1990). New roles for students as active learners and teachers as facilitators of learning likely will emerge as two of the outcomes of these changes. Therefore, it is crucial for educators and policymakers to understand the nature of these changes and how those changes may have an impact on students and teachers. It is especially important for them to put into place policies that will provide the "best chance" for these changes truly to make a difference in the outcomes of K-12 education.

Teachers' Roles in New Assessments
The reform initiatives under way in most states seem to have as their focus attempts to answer two questions: What should students know and be able to do with what they know when they graduate from high school? How can it best be determined what students know and can do when they graduate from high school? The first question asks what the outcomes of K-12 education should be, and the second question asks what methodology is best to determine the degree to which those outcomes have been realized. Discussion and debate about what the outcomes of K-12 education should be is interesting to all educators; however, we briefly discuss the methodologies that seem likely to be used to measure student achievement outcomes and then concentrate on the role teachers will likely play in new statewide assessment programs. Of special interest are questions of whether teachers are ready for those new roles and if they are not ready, what can be done to prepare them.

It is becoming increasingly clear that the K-12 educational reform currently under way in the United States will likely include new assessments intended to determine students’ academic achievement. It is also clear that at least some of the assessments used for this purpose, such as performance assessments, will require teachers to be active participants in the assessment activity, or at least in the preparation of their students for the assessments. This active role in assessment activities is both new and not new for teachers. The active role is new in the sense that teachers in the past have participated in statewide assessments primarily as proctors of the pencil-and-paper standardized norm-referenced multiple choice tests that have dominated large-scale assessments for the past 30 years (Jett, 1991); however, an active role in the classroom-assessment of student performance is not new to teachers because they, in fact, already spend significant instructional time engaged in such activities (Stiggins, 1987).

Because of impending changes in K-12 education, it is likely that classroom teachers will, in addition to becoming active participants in statewide assessments of their students’ academic achievement, be expected to use assessment activities that are instructionally sound in their daily teaching. The often used phrase “blurring the line between instruction and assessment” is likely to become a reality in many teachers’ classrooms. Teachers may be expected to design, administer, and evaluate the results of classroom assessments as they relate to the desired instructional outcomes of the courses they are teaching, and as they relate to the desired outcomes of the statewide assessments their students will encounter. Thus, a crucial factor to the success of K-12 educational reform seems to be the knowledge and skill levels of classroom teachers related to assessment. Questions in this regard that seem to need answers urgently are the following: How well equipped are current teachers in terms of their knowledge and skill in assessment activities? What actions should take place to ensure that teachers in the future will be knowledgeable and skillful assessment practitioners?

**Teachers’ Training in Assessment**

Teachers' training in classroom assessment has historically been sparse and when it does occur, the topics taught are not relevant to teachers' daily classroom assessment activities and therefore are often misdirected (Schafer & Lissitz, 1987). Although teachers are responsible for the design and construction of classroom assessment environments, they have little formal training that would assist in those activities (Coffman, 1983; Ward, 1980). Many teachers complete little or no course work and do not participate in in-service training on the topic (Stiggins, Bridgefords, & Conklin, 1986). Moreover, states have not required teachers to be trained in assessment as a condition of professional certification (Burdin, 1982; Noll, 1955; Schafer & Lissitz, 1987; Stinnet, 1969; Woeller, 1979). Lack of requirements for teachers to demonstrate competence (or even to have completed a specific number of credits) in assessment continues today as reported by O'Sullivan and Chalnick (1991), whose findings are consistent with those of the previously cited researchers who identified this problem as early as 1955 (Noll, 1955).

O'Sullivan and Chalnick (1991) reported the following:

The most optimistic interpretation of the information gathered indicates that fewer than a third of the 51 teacher certification agencies require specific course work or enumerate competencies in education tests and measurement for initial certification. This implies that the vast majority of teachers entering the profession are deficient in measurement training. (p. 18)

Using O'Sullivan and Chalnick's (1991) findings, for every 10 teachers teaching in K-12 education, fewer than 4 of them have been required to complete one or more courses in classroom assessment to become certified by state education licensing agencies. This suggests that about 6 out of 10 teachers who are currently in the nation's classrooms have not had formal course training in classroom assessment. These proportions, when extrapolated to represent the entire teaching population nationwide, suggest the magnitude of the discrepancy between the identified, researched, and validated need for teachers to be trained in classroom assessment and the reality of the number and percentage of teachers who have received such training, whether or not it was required for certification to teach.

**Current Research About Teachers' Training in Classroom Assessment**
Our study (Jett & Schafer, 1992) concerning teachers' training in classroom assessment provides further evidence that teachers are generally untrained to carry out classroom assessment activities. A statewide proportional random sample of Maryland high school teachers was surveyed to determine, in part, the amount of training they received in classroom assessment and the source of that training, the findings are based on the responses contained on 538 usable surveys (44.1%, return of 1,220).

**Survey Instrument**

The study design sought to collect information concerning teachers' training in classroom assessment from a sample of high school English/language arts, mathematics, science, and social studies teachers that would be representative of the statewide population of teachers in those academic disciplines. A 28-item survey, primarily intended to determine teachers, knowledge about and attitudes toward a performance assessment, the Maryland Writing Test, also contained three items directly related to teachers' training in classroom assessment. These three survey items were the following:

1. Have you earned college credit for taking one or more courses in classroom measurement?
   - yes  - no

2. Have you ever taken another course in which classroom measurement was a part?
   - yes  - no

3. Have you ever taken an in-service course in classroom measurement?
   - yes  - no

**FINDINGS**

To determine high school teachers' educational training in classroom assessment, survey respondents were asked to provide information concerning whether or not they had earned college or in-service credit in courses that dealt specifically with classroom measurement of student achievement and in other courses that had at least a major component in classroom assessment of student achievement. In the following tables and the discussion concerning them, these terms used.

1. Assessment Course: A college course specifically designed to teach students about classroom measurement theory and techniques
2. Other Course: A college course in which classroom assessment theory and techniques were part of the overall course of study
3. In-Service: A course in classroom assessment taken after employment as a teacher and offered by other than a college or university (e.g., a school system)

Although there certainly are other opportunities for survey respondents to have received training in classroom assessment, including on-the-job-training, peer coaching, and others, it is our view that the three methods listed previously are the most likely means for teachers to receive structured, planned, and meaningful training in classroom assessment. Therefore, absent any training through one or more of those means it seems likely that currently employed teachers are untrained in the theory and practice associated with classroom assessment. Nevertheless, we emphasize that merely completing course requirements through any of these three means in no way implies competency in the effective use of classroom assessment theory and techniques by those who completed the courses. Successful completion of such courses, however, does suggest there is a greater likelihood that the teacher has some knowledge, understanding, and skill in classroom assessment.

**Distribution and Return of Survey Instruments**

The survey instruments were distributed, through a proportional random sampling procedure, to 1,220 teachers of English/language arts, mathematics, science, and social studies who currently teach in those academic disciplines for most of the school day in all 24 public school systems in Maryland. Surveys were returned from teachers in all of the systems.

The teachers who returned surveys represented all 24 public school systems in approximately the same proportion as the total number of teachers who teach students in grades 7 to 12 in their school systems. Mathematics, science, and social
studies teachers statewide participated in this study in relatively equal and almost identical numbers; English/language arts teachers participated in it at a rate that is more than 30% higher than teachers in the other three academic disciplines. This was likely because of the context of the survey, the Maryland Writing Test, which may receive greater emphasis in English/language arts curricula.

Because three possible sources of training in classroom assessment were identified for this research, the following eight possibilities existed for each survey respondent:

1. Assessment course, other course, and in-service
2. Assessment course and other course
3. Assessment course and in-service
4. Other course and in-service
5. Assessment course only
6. Other course only
7. In-service only
8. None (no training in classroom assessment from any of the three sources)

Because the eight categories included all possibilities in terms of amount of and sources of training in classroom assessment used in this research, each survey respondent was placed in one and only one category. The data were analyzed by number of years taught and for the total sample.

Table 1 presents information regarding the number and percentage of survey respondents by the number of years taught and the sources of their training. There are 10 number-of-years-taught categories and eight sources of training in classroom assessment categories across which data were presented. Analysis of data is perhaps most clear if presented by sources of training categories rather than by number-of-years-taught categories.

Respondents who have the highest percentage having received training in category 1, assessment course, other course, and in-service have taught from 10 to 12 years (25.4%), 19 to 21 years (25.8%), and 28 or more years (30.0%) have the highest percentage having received training in category 1, assessment course, other course, and in-service. The three or fewer number-of-years-taught category has the lowest percentage (7.1%) of respondents with training in this category.

Respondents who have taught from 4 to 6 years (37.9%) and 25 to 27 years (33.3%) have the highest percentage having received training in category 2, assessment course and other course. Respondents who have taught from 10 to 12 years had the lowest percentage (17.5%) who have received training in classroom assessment through assessment course and other course.

Category 3, assessment course and in-service, had a total of 12 respondents in it with the 25 to 27 number-of-years-taught category having the most, 3. Category 4, other course and in-service, also had few respondents in it, 21. Of those 21 respondents, however, 4 were in the 3 or fewer number-of-years-taught category, which represents 9.5% of all teachers in that number-of-years-taught category.

In categories 5, 6, and 7, all of which are single sources of training in classroom assessment, more respondents had assessment course as a single source of training (82), followed by other course (60), with in-service as the only source of training having only 9 respondents in that category. Noteworthy among the numbers and percentages in those three categories is the fact that 24.2% of teachers who have taught for from 16 to 18 years have received classroom assessment training from an assessment course only, that 23.8% of teachers who have taught 3 or fewer years have received classroom assessment training from an other course only, and that only 9 respondents have in-service training as their only source of training in classroom assessment.

In the no-training category, 23.8% of the respondents who have taught from 10 to 12 years, 23.1% of the respondents who have taught from 13 to 15 years, and 21.4% of the respondents who have taught 3 or fewer years are in category 8 and reported no training in classroom assessment from any of the three sources identified in this research. The number-of-years-taught category with the lowest percentage of teachers with no training from any of the three sources identified is the 28-or-more-years-taught category (6.7%).

The total number and percentage of survey respondents with training in classroom assessment by source of training are presented in Table 2. The data in the table show that category 2, assessment course and other course, has the highest percentage (28.8%) of respondents. and category 7, in-service only, has the lowest percentage (1.7%). Furthermore, 18.6% of respondents received training in category 1, assessment course, other course, and in-service, whereas 32.6% of the respondents received training in classroom assessment from a single source (categories 5, 6, and 7). An additional 17.3% of
all survey respondents are teaching in Maryland's high school classrooms with no training whatsoever in classroom assessment from any of the three sources identified in this research.

**DISCUSSION**

The findings of our research suggest that almost one in five high school English/language arts, mathematics, science, and social teachers in Maryland have no training whatsoever in classroom assessment. When the percentage of teachers with no training in classroom assessment is combined with the percentage of teachers who have training in classroom assessment from only a single source (assessment course, other course, and in-service course), 46.5%, or almost half, have no training or training from a single source. The sparsity of teachers' training in classroom assessment is of great concern, because competence in classroom assessment has been identified as significant to successful teaching and assessment is likely to constitute an even larger part of teachers' professional activities in the future. These findings are not unlike those of others cited earlier. This situation is exacerbated by the fact that whatever training in classroom assessment does take place in colleges or universities or through in-service for prospective and current teachers, it does not guarantee that teachers are knowledgeable and skillful users of effective classroom assessment techniques.

The movement toward performance assessment in public education is intended to provide more valid information about "what students know and can do with what they know" to inform the public as well as policymakers about the effectiveness of education systems at state and local levels. In addition, performance assessment is thought by many to make better use of instructional time, because the new assessments may be designed as vehicles for the delivery of effective instruction as well as being data providers about school effectiveness.

These considerations suggest that teachers in the public high schools of the future will make more use of classroom assessment activities than they currently do. Thus, the most of current and soon-to-be teachers should receive commensurate training in classroom assessment to become skillful assessment practitioners. This includes new and experienced teachers because, as was concluded from the findings of this research, the amount of training teachers have does not seem to vary according to the number of years they have taught. Therefore teachers in mid-career, and teachers in the later part of their careers will need increased knowledge and skills in classroom assessment along with newly inducted teachers.

To ensure that teachers have these critical assessment skills could require changes in the state teacher certification standards. For example, a state department of education could propose policy changes that, if adopted by its state board of education, will ensure that teachers in that state, in the near future, are knowledgeable about and skilled users of effective classroom assessment techniques. One possibility for a state board of education is to adopt by-law changes related to the certification and re-certification of teachers so that they are able to demonstrate they are knowledgeable and skillful practitioners of effective classroom assessment techniques.

This might be accomplished through several means. For example, through by-law changes, the state board of education can require the demonstration of this knowledge and skill as a requisite for state certification and renewal of teaching certificates. This action raises the question "How would teachers (principals and supervisors, too!) demonstrate their knowledge and skill in classroom assessment?" Would it be accomplished through college or university or in-service credit count, or might they demonstrate their knowledge and skill in classroom assessment through an actual performance assessment?

It may be possible for the state department of education to require performance of activities that would demonstrate knowledge and skills in classroom assessment by teachers wishing to become certified to teach in the state. It may be best to determine teachers' knowledge and skills in classroom assessment through a process that models the very techniques about which teachers are expected to be knowledgeable and skillful--performance assessment.

The preparation of teachers for this assessment could take several forms. For example, the state department of education could train and certify teacher coaches in each school system in the state who in turn could coach current teachers at the local level in preparation for the "state certification assessment" in classroom assessment. Another example could be the establishment of courses or seminars in classroom assessment at colleges and universities in the state. These courses or seminars could be offered by teams of college or university, school system, and state department of education personnel. The purpose of the courses or seminars would be to prepare teachers for a statewide certification assessment in classroom assessment.

For prospective teachers, undergraduate education programs could be modified to ensure that graduates have the knowledge and skill necessary to be successful on a state classroom assessment certification assessment. Moreover, in addition to meeting the current certification requirements of passing the National Teachers' Exam, and meeting degree, credit count, and student teaching standards, prospective teachers would also be required to be successful on the...

suggested state classroom assessment certification assessment to become certified to teach in the state.

Through by-law amendments, different from those previously discussed, policymakers could also take a major step toward ensuring that teachers are knowledgeable and skillful users of effective classroom assessments by making changes in teacher preparation programs in postsecondary institutions. Those by-law changes could have as an outcome teacher preparation programs that produce teacher graduates who possess thorough knowledge and can demonstrate superior skills in classroom assessment.

At the local level, each school system could also develop and implement a training program in classroom assessment for current teachers. Collegial teams of teachers could work together within individual schools or between or among schools; individual teachers could coach or mentor other teachers; knowledgeable and skillful principals could work with teachers on their staff, teachers on other schools staff, or with other principals and assistant principals; curriculum supervisors could conduct specific professional development activities for subject-area teachers that had classroom assessment as their focus; local staff development personnel could offer and conduct, in collaboration with teachers and principals, workshops, seminars, and drop-in sessions, all focusing on classroom assessment, Individual school districts could also call on local college and university personnel to collaborate with them in the planning for and delivery of training activities for current teachers.

Local school systems could also build in incentives for teachers and principals who become experts in this crucial topic. Those incentives could be in a financial or another form that can provide recognition for the professional competence of those teachers and principals.

In the past when a state board of education wished to accomplish high-priority policy goals, it has made significant changes that can now serve as precedents. For example, in Maryland during the past decade the State Board of Education placed a high priority on having all teachers in the state become knowledgeable about two specific topics; reading and special education. As a result of a strongly held belief in the importance to the education system in the state and the students it serves, the Maryland State Board of Education employed a policy strategy that required, and continues to require, all Maryland teachers to have training in special education and reading. This training is verified by college, university, or in-service credit count and is directly linked to certification and re-certification requirements. Through this action, the State Board of Education ensured that Maryland teachers obtained the training it felt important, and in a relatively short period of time its objective was accomplished. This example is used to illustrate how a state board of education can make changes that influence teachers and students, and to suggest that it can be done again in the essential area of classroom assessment.

Moreover, local school systems may be able to seize on what might be a brief window of opportunity to significantly improve the quality of teaching and learning for teachers and students through participation in a creative and significantly different collaborative effort with the their state departments of education and state colleges and universities. This can be an opportunity for local school systems to be active participants in the determination of the direction of education not only in their school systems, but in the direction of statewide public education as well.

Should colleges and universities fail to modify teacher preparation programs so their graduates are knowledgeable and skillful practitioners of effective classroom assessment, it is likely they will be preparing teacher candidates who will be unable to teach effectively in public schools. Those who teach in classrooms in the near future need these skills, and it is the right time for change in teacher preparation programs as well as programs for professional growth of teachers.

**TABLE 1 Number and Percent of Respondents With Training in Classroom Assessment by Number of Years Taught and Sources of Training**

<table>
<thead>
<tr>
<th>Sources of Training</th>
<th>3 or Fewer</th>
<th>4 to 6</th>
<th>7 to 9</th>
</tr>
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<tbody>
<tr>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Assessment course, other course, and in-service</td>
<td>3</td>
<td>7.1</td>
<td>11</td>
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<tr>
<td>Assessment course and other course</td>
<td>8</td>
<td>19.0</td>
<td>22</td>
</tr>
<tr>
<td>Sources of Training</td>
<td>10 to 12</td>
<td>13 to 15</td>
<td>16 to 18</td>
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<td>----------------------------------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Assessment course, other course, and in-service</td>
<td>16</td>
<td>9</td>
<td>10</td>
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<tr>
<td>Assessment course and other course</td>
<td>11</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Assessment course and in-service</td>
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<td>2</td>
<td>1</td>
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<tr>
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<td>3</td>
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<td>6</td>
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<tr>
<td>Other course only</td>
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<td>2</td>
</tr>
<tr>
<td>None</td>
<td>15</td>
<td>15</td>
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Number of Years Taught

<table>
<thead>
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<th>Sources of Training</th>
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<th>22 to 24</th>
<th>25 to 27</th>
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<td>10</td>
</tr>
<tr>
<td>Other course only</td>
<td>6</td>
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<td>3</td>
</tr>
<tr>
<td>In-service only</td>
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<td>0</td>
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<tr>
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<td>10</td>
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Number of Years Taught

<table>
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Numbers of Years Taught
TABLE 2 Total Number and Percentage of Survey Respondents by Sources of Training

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<th>%</th>
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<td>In-service only</td>
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<td>1.7</td>
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<td>17.3</td>
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<td>1.7</td>
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Note. N = 538.

REFERENCES


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