The Alignment of Teacher Assessment Efforts and Public School Assessment—Lessons Learned

Dr. Robert E. Gabrys

It is a pleasure to have this opportunity to provide a perspective on teacher assessment that stems from the work that we have been doing in public school assessment. Specifically, I intend to talk about the reform effort in public school education, particularly in Maryland, and to address the lessons learned that might be helpful as you consider teacher testing issues. I think there are indeed lessons to be learned; and heeding those lessons, I believe, will actually determine whether the reform effort is successful as system reform or is merely another "bandwagon" that amounts to tinkering around the edges.

Historically, linkages between public education (K–12) and higher education teacher education have been rocky, to say the least. The structures of higher education and public education have very little in common, and, unfortunately, more time has been spent critiquing each other's structures than seeking to understand weaknesses and capitalize on the strengths. Institutions of higher education have sought to be more responsive to the need for hands-on teacher training through increased number of field experiences, the teacher center movement of the '70s, joint appointments, and clinical professorships. But still we hear that teachers are not prepared for the "real world of the classroom."

When higher education looks at the "real world of the classroom," however, they can find little satisfaction in preparing college graduates for an environment that provides virtually no professional time for the teacher, frowns upon absence from the classroom for any reason, and produces a graduate that in too many instances can be described as semiliterate and unable to function as a contributing member of society in either the business or social world.

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Hence, it would appear that neither system is actually worth preserving and that what is needed is a radical reform of public education that includes teacher education. The issue is not one of blame, but of changing paradigms. The status of education has clearly changed. Education is no longer a privilege, it is no longer an opportunity that one can choose or reject. Certainly, the technology by which education can occur has changed dramatically, but that change has yet to affect public education (K–12), which continues to look like the same system that we and our parents, and our grandparents, recognize. That is certainly an education phenomenon, because in few other areas of society can one point to commonalties with the world of our grandparents.

The new paradigm calls for learning on the part of all children, with learning defined much more by an educated society than by the "experts." It calls for an accountability on the part of public education to provide schools where children can and do learn, and it calls upon a continuous-improvement design that recognizes rapid growth in knowledge and the ability to apply knowledge in new settings to solve problems, think creatively, and analyze critically.

Public schools are being called upon to reflect an accountability system that measures success not in terms of traditional testing methodologies but in terms of real-world applications in multiple contexts. It calls for an assessment system that recognizes rather than ignores the importance of background knowledge. It calls for collaborative problem-solving rather than individual solutions. It calls for an assessment system that is not shrouded in mystery but reflective of the instructional process. It calls for all of this and more—because it calls for the student to reflect the above skills in the context of a strong, uncompromising need to have a high-quality knowledge base upon which to build these other skills.

It is in the context of this paradigm shift that I would like to discuss a brief overview of the Maryland program and the potential lessons learned from our work to date which might be helpful. We do not have the answers, we have made mistakes, we have not conquered the issues of collaboration with higher education, but we have made significant progress in opening public education to the business community.
The Maryland School Performance Program is a systemic reform initiative which is founded on three premises:

- All children can learn.
- All children have the right to go to a school where they can learn.
- All children should learn rigorous content.

Seemingly platitudes, they are not. They undergird the decision-making process and serve as the criteria for determining the best course of action, when we are not choosing between dichotomous right-wrong directions, but when virtually any one of five directions might appear appropriate.

The program contains five main components:

1. **Data-based Areas.** This factor refers to the variable that a state, a local school district, and a school building should identify as reflective of the vision and mission of the school. It assumes that a collaborative partnership exists in education but that the fundamental unit of analysis is the school. In this paradigm shift, the state and the local district exist to support the building and the teachers in their efforts to make the three premises mentioned above a reality. The customer is each student in the school; the suppliers are the teachers, the district, and the state.

2. **Standards.** Any time one identifies data-based areas, it is crucial that a standard of acceptable performance be applied publicly so that one can evaluate the effectiveness of the enterprise. It is the lack of common standards, publicly displayed, that has allowed public education to identify different goals for different students, to blame the student when learning does not occur, or to take credit for success after the fact based upon some demographic characteristic about the learning. In such an environment, lack of learning can be blamed on single-parent families, lack of homework, student disinterest, lack of respect, and, more recently and perhaps most insidiously, poverty.

3. **Public Reporting.** This element is crucial. Educators are fully aware of the success of public schooling, without reports. Parents, non-parent taxpayers, and businesses are not. They have a right to know, via unambiguous reporting mechanisms,
exactly what the success rate is and what the yield is for the dollars spent.

4. **School Improvement.** Perhaps no component receives "short shrift" more than this one. It is one thing to establish assessments and report cards to reflect accurately on the status of education. It is quite another to use that data for decision-making and for structural change. It requires a paradigm shift that says that certification, either initial or permanent, is not synonymous with "endowment with skills" to solve every problem or with the ability to make adjustments for new methodologies by osmosis. This is truly a paradigm shift easily verified by a look at virtually any school, district, or state budget relative to funds devoted to staff development. This is especially true now, since radical reforms are called for but little funding appears. Maryland is no exception in this arena. We have suffered massive cuts at every level, and yet our expectations and timeline have remained the same. Those decisions are tantamount to a company's intending to introduce a new product line or service but saying staff are on their own to learn about the product, to garner support for it, and to make it happen as an effective moneymaker. Perhaps it is good that education is by and large a monopoly, because as a competitive business it would have disappeared a long time ago.

5. **Accreditation.** This is the fundamental accountability part of the program. It calls for the recognition of effective school environments and the cessation of those that are ineffective. It is the bottom line—arrived at as a result of analyzing data, reviewing the data in terms of standards, reporting to the public, providing exhaustive school improvement efforts, and evaluating whether the total system is worthwhile.

A major part of this school improvement effort is a performance assessment program which has been implemented since 1991 with all students in grades 3, 5, and 8 and which is currently under development at the high school level in conjunction with performance-based graduation requirements.
The performance assessment features a number of contrasting aspects to traditional assessments, as depicted in the chart below. A sample task is attached as an appendix.

**CHARACTERISTICS OF TRADITIONAL AND PERFORMANCE ASSESSMENT**

<table>
<thead>
<tr>
<th>TRADITIONAL</th>
<th>PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢ One mode (paper/pencil)</td>
<td>➢ Multiple modes (exhibitions, performances, portfolios, essays, interviews, observations)</td>
</tr>
<tr>
<td>➢ Administered in short, structured period of time</td>
<td>➢ Range in degree, structure, length, and resources</td>
</tr>
<tr>
<td>➢ Taps limited cognitive skills</td>
<td>➢ Taps range of abilities</td>
</tr>
<tr>
<td>➢ Limited learning dimensions</td>
<td>➢ Multidimensional</td>
</tr>
<tr>
<td>➢ Taps discrete skills</td>
<td>➢ Taps integrated abilities</td>
</tr>
<tr>
<td>➢ Atomistic</td>
<td>➢ Holistic</td>
</tr>
<tr>
<td>➢ Isolated event</td>
<td>➢ Ongoing event</td>
</tr>
<tr>
<td>➢ Decontextualized</td>
<td>➢ Contextualized</td>
</tr>
</tbody>
</table>


What, then, are the lessons learned?
I would identify five areas for discussion:

1. **The paradigm of accountability through school improvement rather than school improvement through accountability.**

This concept is crucial to the reform/restructuring effort because it highlights the necessity of state agencies' being a partner in the school improvement process, not just a government agency turning out report cards and data about deficiencies. The latter paradigm has been tried in the past and has never resulted in truly lasting change. It has the same impact as negative reinforcement insofar as its impact lasts only as long as the punisher remains on the scene. Hence, we have seen college after college undergo
"on-site reviews" by visiting teams representing accrediting bodies, undertake intensive review and report planning, only to revert to its former practices as soon as the review teams leave.

The new paradigm calls for the identification of standards, establishment of baseline information regarding the current position of the standards, establishment of milestones of progress toward the standards, and the development of an improvement process with the necessary resources by which the school will arrive at the standards. Coupled with such a process, Maryland allows the schools five years from the date of adoption before the standards are used in an accountability manner. In this paradigm, if the state department of education merely reports on progress toward the standards over that five-year period and provides no human and fiscal resources to the school and its faculty, clearly it is part of the problem and would have difficulty implementing its accountability system at the end of the five-year period. In this paradigm, school improvement makes accountability possible as opposed to the ineffectual paradigm of accountability expected to produce school improvement.

2. The essential need for staff development.

Typically, we have hoped to produce reform by fiat. It is now clear, however, that we are paralleling a retooling by a business in which a systematic retooling of resources—both human and physical—is necessary before the change can be completed. No business would assume it could introduce a new product line or service without a complete training of its staff. In contrast, education assumes that teachers who were certified anywhere from one to thirty years ago should be expected to adjust because change is being expected or mandated. Even within higher education teacher education, we are quick to criticize teacher trainers and slow to provide staff development to implement change.

3. A comprehensive system that does not focus on a single test but on portfolios or profiles.

Throughout the history of American education we have been searching for the single test that will provide all of the answers to a complex reform effort. Only now are we beginning to realize that multiple and repeated measures are necessary, as are trend lines that indicate success rather than attribute infallibility to a single instrument. We are coming to realize that education is at least as complex as a successful economy. Success in the economy is established by viewing a series of indicators on a quarterly basis.
and identifying a trend. In economics, when a single indicator does not fit the trend in one quarter there is no call to eliminate it, for the next time it may well contribute to the trend. Each indicator, therefore, is viewed as important. The parallel in education is clear, but first we must reach consensus on the indicators, an effort that the federal government is attempting to foster through national indicators.

We have also come to realize that teacher professional judgment should count at least as much as formal test data, since the teacher is interacting with the student for some 180 days per year as opposed to the snapshot provided by a test instrument, performance or multiple choice, norm or criterion referenced.

It is interesting to note that in Maryland, when local school systems totally endorse performance tasks as the mode of assessment used by classroom teachers and the state, student scores have tended to decline on more traditional standardized tests. This phenomenon once again raises a caution that life is not all standardized or performance-based and that a single test format cannot be used exclusively.

4. The importance of customizing.

In public school reform it has become important to ensure ownership of indicators and assessment measures by public school personnel. The time of using totally off-the-shelf products appears to be at an end. Virtually all testing companies are now producing both norm-referenced and criterion-referenced products that allow for customization. This product development feature parallels the effort in teacher licensure testing wherein states have now assumed it is important to link public school curriculum with teacher education. Hence, customization is on the rise in teacher education as well. We now see that no one test can provide the answer to the complexity of teaching any more than any one test can provide the answer to the complexity of learning.

In addition, it is extremely important to customize the reporting of data so that the data are used not only for accountability purposes but for instructional improvement. Basically that means data need to be reported in manners and levels of specificity that provide the classroom teacher with instructional information, which is not a typical use of state testing reports. Teachers must feel that they are the customers for test data, and test reporters must be responsive to customer needs rather than concerned with training teachers on how to interpret "numbers."
5. **Essential linkages to higher education.**

a. It is essential that we link public schools with higher education so as to conduct the necessary research and evaluation on the reform effort and its programs. In addition, the content of public school education needs to be linked to the content areas within higher education. The content cannot be determined solely by public school educators whose background may be limited with respect to content. For instance, we need to have science teachers linked with space scientists. We need to link physics teachers with the work of physicists. We need to ensure that what we are teaching is truly science, mathematics, history, etc., not those fields as interpreted by educators who may not have a thorough or current grounding in the content areas.

b. Action research is also a fundamental part of the reform effort. After all, the true test of the reform effort is whether learning occurs and whether it occurs on the part of students who previously were not learning, with no diminution, and hopefully an increase, in the learning by the group who had previously been successful. Hence, it is important to minimally disaggregate data by race, gender, and economic status. Higher education needs to make an institutional commitment to conducting such research since public schools are ill-equipped with staff, expertise, and objectivity in such a high-stakes accountability effort.

c. For such efforts to be successful, however, higher education institutions must view the public schools as the customer and themselves as the supplier. This paradigm shift will necessitate some shifting of "ivory tower" thinking and much more of an orientation toward total quality collaboration and continuous improvement.

d. Higher education teacher education in turn must also shift its paradigm from process teacher education to a performance-based program that links program exit requirements directly to beginning teacher expectations in terms of effecting student learning. Failure to do so will mean that the massive needs for staff development related to reform will continue well beyond affordability. The pipeline of new teachers will continue to provide individuals in need of immediate retraining for the job.

The paradigm of accountability through school improvement as opposed to the traditional school improvement through accountability is a crucial shift in the current reform focus. This shift allows
one to identify baseline information, a target for attainment, milestones for achievement annually, and a constant update on the impact of lack of resources on goal attainment. Hence, state departments of education will no longer focus on merely telling schools to get better but on sharing responsibility for school failures when schools are not staffed and resourced adequately. Perhaps through such a collaborative effort we will build programs and schools responsive to the needs of all learners and truly implement the three hallmarks of educational reform in Maryland:

- All children can learn.
- All children have the right to go to a school where they can learn.
- All children should learn rigorous content.
MARYLAND SCHOOL PERFORMANCE
ASSESSMENT PROGRAM

Sample activities,
student responses, and
Maryland teachers' comments
on a sample task

MATHEMATICS
GRADE 8

February 1991

Maryland State Department of Education
Maryland School Performance Program Office
in collaboration with the
Division of Instruction
Program Assessment, Evaluation, and Instructional Support Branch
INTRODUCTION

This document has been produced for the use of classroom teachers for the express purposes of:

1. Familiarizing them with a sample task that may be contained within the assessment.
2. Giving them examples of actual activities to which Maryland students were asked to respond.
3. Providing draft scoring information which was used to score the student responses.
4. Providing sample student responses for each score point.
5. Providing Maryland teachers' comments on the implications for preparing students for the May 1991 test administration.

The figure on the inside cover of this document shows the relationship of the various components of the assessment program.

LEARNING OUTCOMES: The Maryland State Board of Education adopted Learning Outcomes in May 1990. These outcomes served as the basis for the development of test forms.

TEST FORMS: A test form is the actual test that a student will take. It includes reading, writing, language usage, and mathematics tasks.

TASKS: Each test form is composed of a series of tasks. The tasks are integrated for reading/writing and language usage. A second set of tasks are mathematics tasks.

ACTIVITIES: Each task is composed of a series of thematically related activities. These related activities produce multiple measures of the state board adopted learning outcomes.

STUDENT RESPONSES: Student responses represent a student's answer which is then scored in order to produce a test report at individual, school, district, and state levels.

The actual test form which a student takes in grade 3, 5, or 8 in May 1991 will consist of 3 reading, writing, language usage tasks and 9 mathematics tasks.

DOCUMENT ORGANIZATION

This document is organized to identify in the shaded box the actual activity to which a student was asked to respond. The section on TENTATIVE SCORING INFORMATION identifies the outcome being assessed, possible scores, and a model response. The SAMPLE RESPONSES section contains an actual student response that represents each score.
Teachers who were involved in the pilot were asked to offer advice to their colleagues around the state about how to prepare themselves and their students for the actual assessment in May, 1991. Their comments are found in the TEACHERS' COMMENTS section.

DOCUMENT DEVELOPMENT

The content resulted from a December 1990 administration of draft tasks, not an entire test form. Only one task at each grade level and in each content area was used. The administration occurred in cooperation with volunteer classroom teachers in a few schools in Frederick and Prince George's counties and Baltimore City. A list of contributors is contained in Appendix A. It is important to note that the tasks and the scoring information were in draft form at the time of the administration. They were sufficiently well-developed, however, to give teachers a good understanding of what to expect in May 1991.

Insights from the administration have already been used by Maryland educators and our contractor to improve the actual tasks and scoring materials. Your comments would also be appreciated and should be sent to:

Hannah Kruglanski
Task Development Project Manager
MSDE-5th Floor
200 W. Baltimore Street
Baltimore, Maryland 21201

Further information on the Maryland School Performance Program is available at the local level from the local leaders identified in Appendix B.
MATHEMATICS TASK • GRADE 8

ACTIVITY — INTRODUCTION
Pretend you are a developer planning to build a new restaurant in your community. You know there are some issues you need to resolve in order to make the restaurant a success. You will need to carry out a study to decide what kind of restaurant to have. The decision will be made in stages. The following steps will help you move through each stage.

In order to decide what kind of restaurant to build, you will be using a questionnaire. A questionnaire is a list of questions you ask to find out what people want. You will be using the following questionnaire:

RESTAURANT QUESTIONNAIRE

Name: ____________________________

1. What is your favorite kind of food? (Circle one)
   Italian  Japanese  Barbecue  Chinese
   Middle Eastern  Homestyle  Other

2. Which is your favorite kind of restaurant? (Circle one)
   Fancy  Family Style  Fast Food
   Eat-in  Eat-in  Take-out

3. What is the most money you want to spend on a meal? (Circle one)
   $20.00 or more  $10.00 - $20.00  Under $10.00

ACTIVITY
In order to use the questionnaire, you will have to develop a survey plan. The survey plan will be a plan for how many people you need to give the questionnaire to and who the people will be. As a developer you will be working with a market research firm to help you make your decision. You will be giving them some of your ideas about the survey plan.

Take about five minutes to think about who would be the best people to respond to your questionnaire. When you have decided who you want to ask, write down your ideas in the space below. Keep in mind that you need to represent many more people than you will ask. Briefly explain why you chose those particular people.
TENTATIVE SCORING INFORMATION

Outcome: Communication

MATHEMATICS - COMMUNICATION RUBRIC

The response:
- models situations using oral, written, concrete, pictorial, graphic, and algebraic methods
- demonstrates an understanding of mathematical ideas and definitions
- demonstrates the ability to interpret and evaluate mathematical ideas
- demonstrates the ability to make conjectures and convincing arguments

4 points:
uses mathematical language (terms, symbols, signs, and/or representations) that is highly effective, accurate, and thorough to describe operations, concepts, and processes

3 points:
uses mathematical language (terms, symbols, signs, and/or representations) that is partially effective, accurate, and thorough to describe operations, concepts, and processes

2 points:
uses mathematical language (terms, symbols, signs and/or representations) that is minimally effective and accurate, to describe operations, concepts, and processes

1 point:
an incorrect response—attempt is made

0 points:
off task / off topic
blank or insufficient to score
illegible

Model Response:
I would ask people of different ages, genders, and races. I would include people who work, people who don’t work, and students. The people should all be members of the community. I would choose these people in order to have a good sampling of people who would use the restaurant.
SAMPLE RESPONSES FOR EACH SCORE

Score point: 1

I would ask people that live in a development. I would ask the people because they would give me a good idea of what kind of restaurant to build. I also might send out some questionnaires in the mail.

Score point: 2

I think the people that respond to my questionnaire should be the people in that particular community. That way I can decide from their answers to the questionnaire what the best type of restaurant would be. By asking the people who live there, I can tell what kind of restaurant fits their taste, as well as their budget.

Score point: 3
The people I chose are the people
in ads from 19-35. I will might
need to ask about 30-50 people
who already had a job be-
cause I will be going into
business and they have had
an experience and I could
ask them how they felt and I
will also need some confident
and hard workers.

Score point: 4

TEACHERS’ COMMENTS
On specific activity and/or scoring:
This activity was preceded during test administration by a brief discussion about surveys
and market research. Some responses indicated misunderstanding of directions.

On instructional implications:
Tasks may be preceded by a preliminary group discussion or guided activity. It may be
helpful for students to have the opportunity to expand upon discussion through written
responses using mathematical language (terms, symbols, signs and/or representations).

Prior to students doing the remaining activities, the group participated in a group activity.
Students were informed that since they cannot really go and sample the people they identi-
fied in their survey plan, they’ll be pretending that the class is a good survey sample. The
teacher/test administrator then polled all the students on their responses to the three
survey questions. All of the students in the group had to tally the number of people (in-
cluding themselves) who responded to the various choices on tables provided for them in
their response books, and then complete the tables. Once their tables were complete, they
were directed to the following questions:
ACTIVITY
You will now create three graphic displays – one for each table. Keep in mind that you should use the kind of display that you think is most appropriate for your survey data. Be sure to label the displays and make sure that the displays accurately represent your data. Your displays might not look exactly like anyone else’s. There is a half-page of space in your book for each graphic display. You may wish to first plan your graphic display on scratch paper before entering it in the book.

TENTATIVE SCORING INFORMATION
Outcome: Statistics

Tentative Scoring Key:
0=blank
1=attempted display but incorrect or minimally correct
2=partially correct (2 or more errors)
3=generally correct (1 error)
4=complete and correct display

Note: possible displays include bar graph, stem and leaf plot, line graph, circle graph. Graphs should include title and labels on axes. All displays should accurately reflect the class survey data according to information recorded on student’s tables.

SAMPLE RESPONSES FOR EACH SCORE
Graphic Display for Table 1:

Score point: 1
0. **Favorite Foods**

Score point: 2 (Japanese, Barbecue, and Other received no votes during class survey.)

1. **What is your favorite kind of food**

Score point: 3 (Information is accurate, but label for vertical axis is missing.)
Graphic Display for Table 2:

Score point: 1

Ring = 1
Necklace = 4
Earrings = 2
Watch = 3
Score point: 2 (One student selected fancy/eat-in, 4 selected family/eat-in, and 8 selected fast food/take out.)

Score point: 3
- People: 7
- Family: 4
- Eat: 1
- Fancy/eating: 1

**Types of restaurants**

Score point: 4

**Graphic Display for Table 3:**

<table>
<thead>
<tr>
<th>Item</th>
<th>T-shirts</th>
<th>Shirts</th>
<th>Shoes</th>
<th>Socks</th>
<th>Glasses</th>
<th>Tennis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td></td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

Score point: 1
Score point: 2 (Five students had selected “Under $10.00.”)

What is the most money you want to spend on a meal?

Score point: 3
Score point: 4

TEACHERS’ COMMENTS

On specific activity and/or scoring:
It was evident from the responses that some of the students did not know how to tally and/or total the results of the classroom survey. To evaluate how successfully students represented their classroom survey data in the three required displays, we ourselves sometimes needed to tally the results of each survey question as tallied on students’ tables. For the purposes of scoring the displays, accuracy was determined by comparing the information represented therein to the information provided on each students’ tables. There was no “double jeopardy,” so that students might receive low scores for their tables because of incorrect or absent totals but high scores on the displays based on their representation of data from the tables. A few students clearly did not understand the meaning of the term “display.”

On instructional implications:
It may be helpful to prepare and familiarize students with a glossary of math terms (such as display) that are commonly used on a statewide basis. Teachers may wish to introduce students to a variety of graphic displays, including bar graphs, stem and leaf plots, box and whisker plots, line graphs and circle graphs and histograms. They should emphasize that to be complete, such work should be clearly and accurately labeled. Some students may need to be reminded of the difference between tallying and totaling numbers.
ACTIVITY
How many students responded to the survey for your group as a whole? _____

TENTATIVE SCORING INFORMATION
Outcome: Statistics
Tentative Scoring Key:
0=incorrect
1=correct
Total should be accurate according to information represented on the student’s tables.

SAMPLE RESPONSES FOR EACH SCORE
No samples needed.

TEACHERS’ COMMENTS
On the specific activity and/or scoring:
We needed to refer back to students’ tables to ascertain whether this answer was correct. If the number differed from table to table, any of the three totals was accepted.

On instructional implications:
None noted.
ACTIVITY
Look at your graphic display for Question 2 of the questionnaire. Assume your data represent 10% of the students in the school. Create a bar graph that shows what the results would probably look like for Question 2 if all the students in the school were surveyed. Fill in the number axis on the left line.

TENTATIVE SCORING INFORMATION
Outcome: Statistics

Tentative Scoring Key:
0=blank
1=attempt at bar graph but incorrect
2=partially correct bar graph (2 or more errors)
3=generally correct (1 error)
4=complete and correct bar graph

Graph should represent the data from #2 expanded 10 times.
Sample responses for each score

Score point: 1 (Student's graphic display for Table 2 indicated that 12 students chose fancy/eat-in, 6 chose family style/eat-in, and none chose fast food/take-out.)

Score point: 2 (Student's graphic display for Table 2 indicated that 2 students chose fancy/eat-in, 4 chose family style/eat-in, and 6 chose fast food/take-out.)
Score point: 3 (Student's graphic display for Table 2 indicated that 1 student chose fancy/eat-in, 3 chose family style/eat-in, and 9 chose fast food/take-out.)

Score point: 4 (Student's graphic display for Table 2 indicated that 1 student chose fancy/eat-in, 4 chose family style/eat-in, and 8 chose fast food/take-out.)
TEACHERS’ COMMENTS

On specific activity and/or scoring:
Some students and teacher/test administrators did not understand that they needed to utilize data obtained in an earlier activity. Many responses contained responses that were only partially correct because of misinformation given to students during the test administration regarding this activity.

On instructional implications:
Since students and teachers are used to multiple choice tests, on which all test items are independent, they may initially be surprised or confused by the interconnections between M.S.P.A.P. activities. Teachers should prepare students to utilize any and all data that they obtain in the course of an activity to help complete later steps in that activity. Activities may often be multi-faceted and may require that students use their judgment about the appropriate transfer and utilization of previously obtained solutions.

ACTIVITY

Write two sentences to describe what you had to do to the original data from Question 2 to create the bar graph for the entire school.

TENTATIVE SCORING INFORMATION

Outcome: Reasoning

Tentative Scoring Key:
0=blank
1=incorrect attempt
2=partial response
3=generally correct response
4=complete and correct response

Model Response:
I extended each bar 10 times (or changed the scale). This will represent 100% of the students in the school.
SAMPLE RESPONSES FOR EACH SCORE

I would have to go around asking different people instead of ask the same people. I would ask them how would they feel about certain types of restaurant.

Score point: 1

1. We had to change the numbers.
2. We had to multiply and divided.

Score point: 2

I just had what was the students of the responding, since they represented 10% of the school population multiplied by 10.

Score point: 3

I had to multiply Question 2’s data times 10%. Then I had to come up with a way to represent the students.

Score point: 4
TEACHERS' COMMENTS
On specific activity and/or scoring:
Since the previous activity posed a problem for some students, this related activity also caused some difficulty.

On instructional implications:
See comments from previous activity on interconnectedness of activities.

ACTIVITY
Based on the results of the survey, decide what kind of restaurant you are going to recommend be built. Use the results of the survey presented in your displays to support your decision. Write your decision and in three sentences describe the type of restaurant you chose. Explain the reasons for your choice.

TENTATIVE SCORING INFORMATION
Outcome: Problem Solving

MATHEMATICS - PROBLEM SOLVING RUBRIC

The response demonstrates:
- the application of problem solving strategies to solve multistep and nonroutine problems
- the ability to formulate problems from situations within and outside mathematics
- verification and interpretation of results
- generalization of solutions and strategies to new problem situations

4 points:
The student is highly effective, accurate and thorough in:
- identifying the problem
- determining an appropriate solution strategy
- correctly implementing an appropriate strategy
- summarizing the results
3 points: The student is partially effective, accurate and thorough in:
- identifying the problem
- determining an appropriate solution strategy
- correctly implementing an appropriate strategy
- summarizing the results

2 points: The student is minimally effective, accurate and thorough in:
- identifying the problem
- determining an appropriate solution strategy
- correctly implementing an appropriate strategy
- summarizing the results

1 point: The student makes some attempt to address the task

0 points: off task / off topic
blank or insufficient to score
illegible

Any decision is acceptable as long as data are reflected and proper reasoning is demonstrated.

SAMPLE RESPONSES FOR EACH SCORE

and it's a huge fast food restaurant.

Score point: 1
I would like to have a fast food restaurant built. The name of the restaurant I would like to have is Crazy Bob's. I would like to have a Crazy Bob's fast food restaurant because there will be a variety of food and the food seems like there will be a fast food restaurant because the people I surveyed most of them chose fast food.

Score point: 2

I chose fast food because more people enjoy fast food and more people like fast food. I also think that many of the people want it. We would get a lot more customers. Honestly, I think we would make more profit. Some of the people may pay up to $5.00 or $6.00 for a meal. They would not lose $5,000 dollars unless the menu is gone up.

Score point: 3

I recommend that a fast food/Chinese restaurant be built because more people enjoy the Chinese food and it will be less expensive. It does not cost as much as Italian or Chinese food. We could probably make a profit of up to $5,000.

Score point: 4
TEACHERS’ COMMENTS

On specific activity and/or scoring:
Many students appeared to be unused to expressing problem solving strategies in writing. They could frequently state their decision and describe the type of restaurant they wished to build, but were less able to explain the reasons for their choice. Sometimes the data from their classroom survey or the ideas expressed in their survey plan had little bearing on their decision. It was sometimes difficult to score those responses which were fluent, but did not clearly articulate any strategy for making a decision.

On instructional implications:
Teachers may need to provide students with more opportunities to write extended responses reflecting the five mathematics strands—technology, problem solving, reasoning, communications, and connections. In addition, it may be very useful to find and integrate in instruction good examples of written expression of mathematics concepts and processes.
APPENDIX A

PARTICIPANTS IN SAMPLE TASK PILOT

Patty Aurburn .................................. Yellow Springs Elementary ....................... Frederick County
Sharon Atkinson ................................. Dunbar Middle ........................................... Baltimore City
Reba Barkley .................................... Parkway Elementary ................................ Frederick County
Denise Borders .................................. Central Office .................................................... Baltimore City
Constance Bray .................................. Dunbar Middle ........................................... Baltimore City
John L. Brown ..................................... William Paca Center ................................. Prince George’s County
Carolyn Burley .................................. James McHenry Elementary ...................... Baltimore City
Jocelyn Burrell ................................... Paint Branch Elementary ......................... Prince George’s County
Debra Buzzard .................................. Ballenger Creek Middle ............................ Frederick County
William Cariot .................................. Central Office .................................................... Baltimore City
Lorraine Costello ................................. Central Office .................................................... Frederick County
Peggy Dahlen .................................... Yellow Springs Elementary ......................... Frederick County
Linda Dudley ..................................... Paint Branch Elementary ........................ Prince George’s County
Maisha Flan ...................................... Paint Branch Elementary ........................ Prince George’s County
John George ..................................... Central Office .................................................... Frederick County
Anne Giordano .................................. William Paca Center ................................. Prince George’s County
Marrice Green ................................... Paint Branch Elementary ........................ Prince George’s County
Diana Griffin ..................................... Garrett Heights Elementary ......................... Baltimore City
Amareasa Haisen ................................. Ballenger Creek Elementary ....................... Frederick County
Katherine Harris ................................. Dunbar Middle ........................................... Baltimore City
Mary Harris ...................................... Garrett Heights Elementary ......................... Baltimore City
Beatrice Hemphall ............................... Garrett Heights Elementary ......................... Baltimore City
J. Thomas Husted ................................. James McHenry Elementary ...................... Baltimore City
Frances Jolley .................................... Dunbar Middle ........................................... Baltimore City
Laith Keane ...................................... Paint Branch Elementary ........................ Prince George’s County
Eva Klein ......................................... Paint Branch Elementary ........................ Prince George’s County
Michael Kline ................................... Ballenger Creek Middle ............................ Frederick County
Warren Long .................................... Parkway Elementary ................................ Frederick County
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<td>Brenda Wright-Harris</td>
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APPENDIX B
LOCAL SCHOOL SYSTEM LEADERS FOR THE MARYLAND SCHOOL PERFORMANCE PROGRAM

Allegany County ................................................................. Dr. Ernest W. Kaylor
Anne Arundel County .......................................................... Dr. Thomas Rhodes
Baltimore City ................................................................. Dr. Norman J. Walsh
Baltimore County ............................................................. Dr. Anthony G. Marchione
Dr. Robert F. McNish
Calvert County .............................................................. Dr. Eugene Uhlan
Caroline County ............................................................ Dr. David R. Jones
Carroll County .............................................................. Dr. Brian L. Lockard
Cecil County ................................................................. Dr. R. Wayne Carmean
Charles County ............................................................ Dr. Walter N. Davis
Dorchester County .......................................................... Dr. Dorothy B. Nave
Frederick County ............................................................ Dr. Kevin C. Castro
Garrett County ............................................................... Mr. Albert R. Ringer
Harford County ............................................................. Dr. Alden H. Hatley
Howard County ............................................................. Dr. James McGowan
Dr. Joan Palmer
Kent County ................................................................. Mr. Joseph E. Duell
Montgomery County ......................................................... Dr. Richard L. Towers
Prince George’s County ...................................................... Dr. Michael Grady
Queen Anne’s County ...................................................... Mr. William A. Storace, Jr.
St. Mary’s County .......................................................... Mr. John Ryan
Dr. Joan Kozlofsky
Somerset County ............................................................ Mr. Jack C. Morgan
Talbot County ............................................................... Mr. Harold Schriver
Washington County ......................................................... Dr. Margaret C. Tricker
Wicomico County .......................................................... Mrs. Charlotte Hayman
Worcester County .......................................................... Dr. Richard Walker