

Student Learning Analysis

EDPS 340

Introduction to Assessment and Evaluation

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Purpose

The purpose of this assessment is to determine the level of student proficiency in certain fourth-grade objectives according to the Michigan Mathematics Objectives. This particular Math Strands Assessment assesses the students on their knowledge of Geometry and Measurement, Data Analysis and Statistics, and Number Sense and Numeration. Between these three strands, the test includes eight objectives. One section and set of directions is given to each objective. For this Student Learning Analysis I will focus my analysis on only three of the test's eight objectives, due to the insufficient number of questions pertaining to the other five objectives. The three objectives chosen for analysis include:

- 1.) The student will be able to use coordinates to identify points on a grid.
- 2.) The student will be able to identify fractional parts of regions and collections of objects.
- 3.) The student will be able to solve basic multiplication facts.

This test for my analysis is only one of a set of tests created by a panel of Michigan educators and lawmakers for all elementary schools in the state of Michigan. This set of tests is unique in that it assesses the students in three areas: 1.) skills students should just be beginning to develop, 2.) skills they should be currently developing, and 3.) skills in which they ought to be proficient. In this way, a single assessment provides teachers an extensive view of each student's development in a variety of areas. Due to nature of this test, a low score may be perfectly acceptable. Students need to score highly only on the objectives in which they ought to be proficient by their particular grade level. Therefore, a failing grade may be deemed acceptable if the failure is in skills that students in a particular grade level ought to be only beginning to learn or developing. Relevancy rests only in which specific objectives were met, rather than overall or raw score.

Administration of Assessment

Context

The purpose of this particular math test chosen for my analysis is to assess the students on their mathematics knowledge and ability to perform mathematical operations. This math test was given to Mrs. Lynn Burns' fourth-grade class at Farrand Elementary School in the Plymouth-Canton School District in Plymouth, Michigan. Eleven boys and twelve girls took the test. Three other students enrolled in the class did not take the test since they were absent, and so will not be included in this analysis.

My Steps in Administering the Test

The week before administering this test, Mrs. Burns informed me of its nature, purpose, and the grading process it required. I reviewed the test's directions, figures and questions at home, in order to prepare myself to give directions and answer students' questions prior to and during the test.

I administered this test on my second visit to Mrs. Burns' classroom on Thursday, January 25, 2007 at 9:30 a.m. After entering the classroom at the start of the school day, the students performed their morning duties and began working on their seatwork. Mrs. Burns was busy attending to her students so I had only a short time to ask her questions pertaining to her general test-taking procedures. The only directions she gave me were to instruct the students to write their names and numbers on the top of their tests, and to place folders upright on their desks in order to minimize cheating.

At 9:30, Mrs. Burns informed her students that they would be taking their math test earlier than usual this morning, since Music class would be interrupting their normal math period in the afternoon. I took the pile of tests from Mrs. Burns' desk and instructed the students to

place folders on their desks and to place their pencils behind their ears (so that they would not begin any writing until all directions were given and all questions were answered.) After they showed me they were ready with a pencil behind the ear, I reviewed with the students test-taking procedures. I said, "I have not been with you during a test yet. What can you tell me about what you should do or not do during the test?" The students answered with statements like, "You should not look at other people's papers," "You can't talk until everyone is finished," "If you have a question you have to raise your hand," and "Leave your folders out." Satisfied with their answers, I asked the students to raise their hands if they had read a book the night before, since I wanted to reward these students with the chance to pass out the test to their classmates. This strategy did not go as planned since all but one student had read a book the night before. While his classmates walked to the front of the room to get their own tests, the student who had not read was forced to wait until I could bring a test to him.

Having reviewed the test before, I knew that it would be necessary to go over the directions with the students since a few sections did not include directions for the students at all. As I did so, I had to continually remind the students to keep their pencils behind their ears because they were not permitted to begin yet. I said to the students, "Can you look at this section and tell me what you think you should do?" Many students immediately raised their hands and gave me the correct answer. I think that many students complete assessments this way – overlooking the directions and simply doing what they think they should do. I asked the students to define for me "personal reference," a term the test referred to. Mrs. Burns also interjected to remind the students that when determining the coordinates of a point on a plane, you must "Go across first, and then up." At this point, I had planned on doing a quick activity to allow the

students get out of their seats and move for a minute or so before they began taking the test. However, I was unable to do so, since Mrs. Burns continued, “OK, you may begin now.”

The students began taking their test, raising their hands if they had a question for me. Many students had difficulty with one particular question requiring them to fill in the missing numbers on a number line. I told the students that I would help them understand what the question wanted them to do, but that I could give them no further help. They were not happy about this, and looked anxious when I walked away.

Eventually the students completed their tests one by one and got up to turn them in to Mrs. Burns or myself. I had to remind the class once that many students were still completing the test and that they were not yet permitted to talk.

Critique

Overall, I believe that my administration of this math test went well. The students allowed me to take over as their teacher, and never deferred to Mrs. Burns. Many students were having difficulty with certain problems, but most eventually discovered the correct answer. The students were very responsive to my introductory questions for them, and were not afraid to ask me for help. I believe that having already spent some time with the students helped them feel more at ease with me as their temporary teacher.

Although the administration of the test went generally well, there are a few things that I did not do well, or would do differently next time. First of all, I neglected to remind the students to write their names and numbers at the tops of their tests as Mrs. Burns instructed to me to do. Secondly, next time I would not allow the students to leave their seats in order to turn their tests in, as I believe this practice fosters cheating and distracts those still working. Instead, I would require students to raise their hands as a signal for me to retrieve their tests.

Teacher Feedback

Mrs. Burns provided me with two items of feedback to my test administration. First, she stated that I did well at reviewing the test directions and procedures with the students by going over each section and asking the students to explain to me what they think the directions are. However, she pointed out my mistake of calling on the wrong students to answer my questions. I had called on the students who had their hands raised. The problem, she said, is that students who raise their hands are those who already understand the directions and do not need the review. Rather, I should call on the students without hands raised who probably do not already understand the directions and who may be inattentive. Mrs. Burns provided encouragement by saying that as I get to know my students better, I will know which will require the extra direction. The second item of feedback Mrs. Burns provided was the general advice to create my own routines and style in my future classrooms. She related that students thrive on routine and that in all classroom situations, especially test-taking and administering, I should stick to a routine.

Display and Interpretation of Results

Description of Tables and Figures

Test scores are organized by student and percent correct for each objective into one table and 4 charts. Table 1 lists the raw data of number of items scored correctly and correlating percent correct by objective for each student. Table 1 also lists Class Average. Figures 2, 3, and 4 each display graphically the results of each objective by student. Figure 1 displays all three objectives by student for ease of comparison.

Group Analysis – Overall Pattern

Table 1 and Figure 1 display overall tests results for all three objectives. Class average for all three objectives is 88%. Nine students averaged 100% on all three objectives, while the lowest average score on all three objectives is 67%. The class performed best on Objective 3 and the poorest on Objective 1. However, as previously stated, the results for this particular test require careful analysis, as each objective is either a developing, beginning, or proficient skill. Fortunately for this analysis, all three objectives tests skills in which fourth-graders ought to be proficient. Consequently, a 96% class average for Objective 3 is expected, while 81% and 83% class averages for Objectives 2 and 3 are concerning.

Table 1.

Number of Items Scored Correctly and % Correct Per Each Objective

Student Name	Objective One:4 Coordinate Points		Objective Two:3 Fractional Parts		Objective Three:5 Multiplication Facts		Objective 1, 2, 3 Totals	
	No. Correct out of 4	% Correct	No. Correct out of 3	% Correct	No. Correct out of 5	% Correct	No. Correct out of 12	% Correct
Alex	4	100%	2	67%	3	60%	9	75%
Aly	4	100%	2	67%	5	100%	11	92%
Bobbie	4	100%	2	67%	5	100%	11	92%
Brianna	4	100%	3	100%	5	100%	12	100%
Chloe	0	0%	2	67%	5	100%	7	58%
Claire	4	100%	3	100%	5	100%	12	100%
Collin	2	50%	3	100%	5	100%	10	83%
Dakota	0	0%	3	100%	5	100%	8	67%
Donovan	4	100%	3	100%	5	100%	12	100%
Eamon	4	100%	3	100%	5	100%	12	100%
Jake	4	100%	3	100%	5	100%	12	100%
Madison	4	100%	3	100%	5	100%	12	100%
Makayla	4	100%	3	100%	5	100%	12	100%
Mikey	4	100%	3	100%	4	80%	11	92%
Nicole	3	75%	0	0%	5	100%	8	67%
Olivia	4	100%	1	33%	5	100%	10	83%
Paul	4	100%	3	100%	5	100%	12	100%
Sam	4	100%	3	100%	5	100%	12	100%
Savannah	4	100%	2	67%	5	100%	11	92%
Shelby	4	100%	2	67%	4	80%	10	83%
Silvi	3	75%	2	67%	5	100%	10	83%

Taylor	4	100%	2	67%	4	80%	10	83%
Tyler	0	0%	3	100%	5	100%	8	67%
Class Average		83%		81%		96%		88%

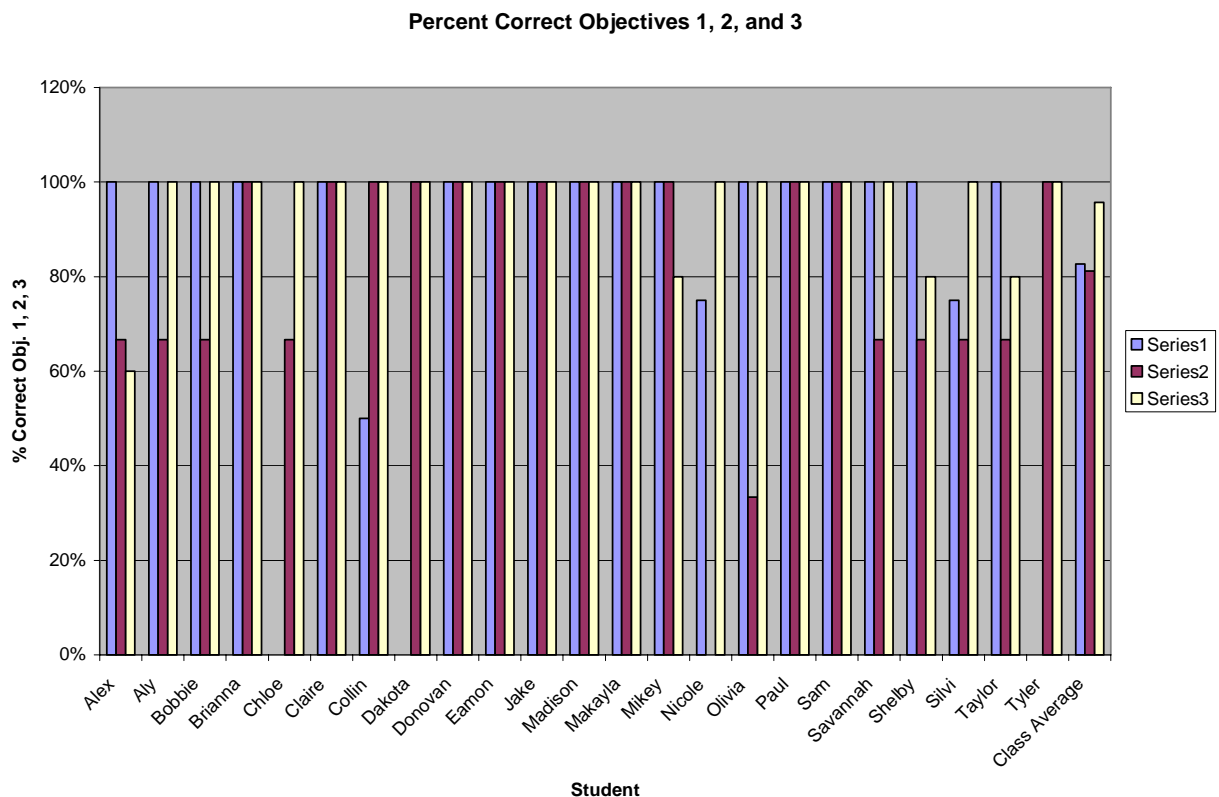


Figure 1. Percent correct by student and class average for objectives 1, 2, and 3,

Group Analysis – Objective 1

Objective 1 tests the students on their ability to *use coordinates to identify points on a grid*. Results for Objective 1 are displayed graphically by student in Figure 2. The class average for this objective is 83%, the middle of the three objectives. This objective consisted of four questions. Students were given a coordinate plane containing four points, and asked to provide the coordinates of the points. Results for this objective are noteworthy in that it is the only objective in which a few students answered zero questions correctly and received a score of zero. Three students named no coordinate points correctly. Three students named two or three correctly, and the remaining 17 students named all four correctly.

Although the class average for this question was 83% correct, I do not believe that this number truly represents class skill in this objective. The reason for this is that while correcting the tests I saw that each student who scored a zero on this objective did so because he or she simply listed coordinate items in the wrong order. These students measured up first and then across second, rather than the opposite. Their answers reflect this incorrect process. These students do possess the necessary skill of using the axis labels to find a point. In this way, I believe that the class average was skewed by these three scores of zero. Had these students listed coordinate items in the correct order, the class average jumps from 83% to an impressive 96% for this objective.

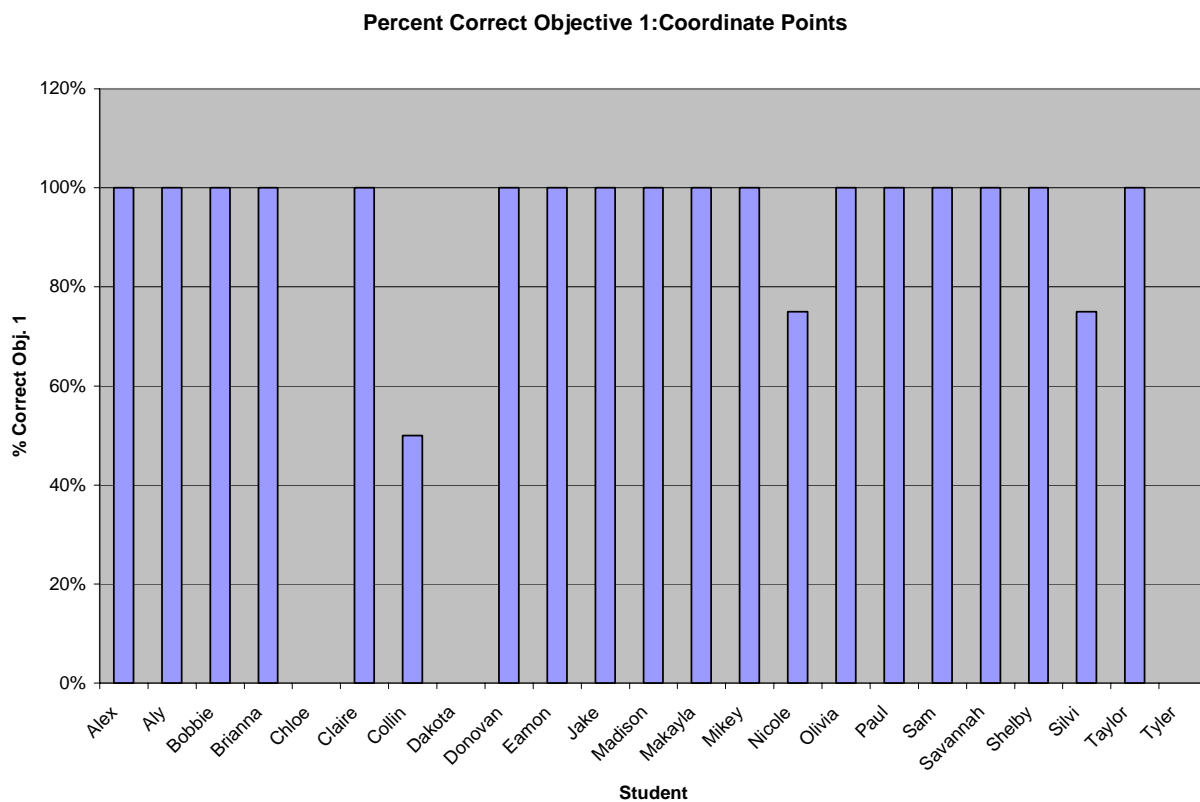


Figure 2. Percent correct for objective 1: Use coordinates to identify points on a grid

Group Analysis – Objective 2

Objective 2 tests students on their ability *to identify fractional parts of regions and collections of objects*. Results for Objective 2 are displayed graphically by student in Figure 3. The class average for this objective is 81%, the lowest of the three objectives. This objective consisted of three questions on the test. Results for this objective are interesting in that of the three test questions, the large majority scored poorly only on the first question. These results are directly related to the nature of the objective. As Objective 2 is written, it actually contains two distinct objectives: *identify fractional parts of regions (1) and collections of objects(2)*. While Questions 2 and 3 tested on the first part of the objective, *identifying fractional parts of regions*, Question 1 tested on the second part of the objective, *identifying fractional parts of collections of objects*.

This particularly difficult Question 1 asked the students to: *Draw 12 balloons. Circle 1/3 of them. Put an X through 1/2 of the remaining balloons*. All students were able to correctly draw the 12 balloons. After that, the students had difficulty. Many circled 3 or 6 balloons. Many put an X through half of the balloons rather than half of the remaining balloons. Judging by the nature of the students' incorrect response, it is possible that many students did not carefully read the question, or that the question was worded ambiguously. Either way, the results of this objective and its problems are very clear when each particular question is analyzed. Students possessed great skill in the first part of the objective, *identifying fractional parts of regions*, as evidenced in the high class average for Questions 2 and 3. However, students poorly possessed skills on the second part of the objective, *identifying fractional parts of collections of objects*, as evidenced by the low class average for Question 1. The problem of this double-objective is that should be separated into two distinct objectives in order to accurately measure student

knowledge for each. As the objective is currently written, the results of its test questions remain useless until separately analyzed.

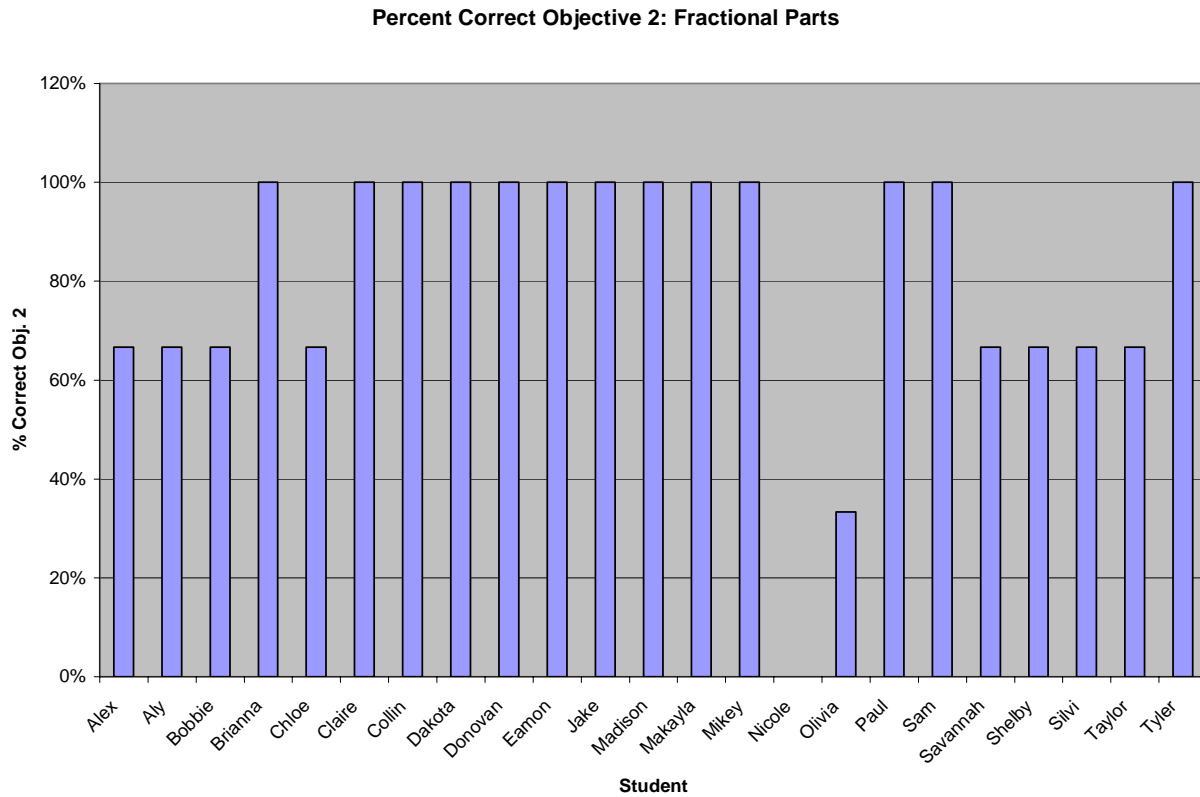


Figure 3. Percent correct for objective 2: identify fractional parts of regions and collections of objects.

Group Analysis – Objective 3

Objective 3 tests students on their ability to *solve basic multiplication facts*. Results for Objective 3 are displayed graphically by student in Figure 4. The class average for this objective is an agreeable 96%, the highest of all three objectives. For this objective, students were given five basic multiplication facts to solve: (4×8) , (9×7) , (8×7) , (6×4) , and (8×6) . Amongst all of the students, only 5 multiplication facts were answered incorrectly. Noteworthy of these results is that of those 5 incorrect, 4 represented the same problem. Student answers for

(8 x 7) varied from 53, 54, 63, to 72. This shows each student is making a different mistake in calculating the correct answer, so it would be very difficult to remedy the problem holistically. Moreover, this objective requires only a low level of cognition – rote memorization – so ambiguity of the question as an explanation is not viable. I suggest that students simply continue to review and memorize these basic multiplication facts.

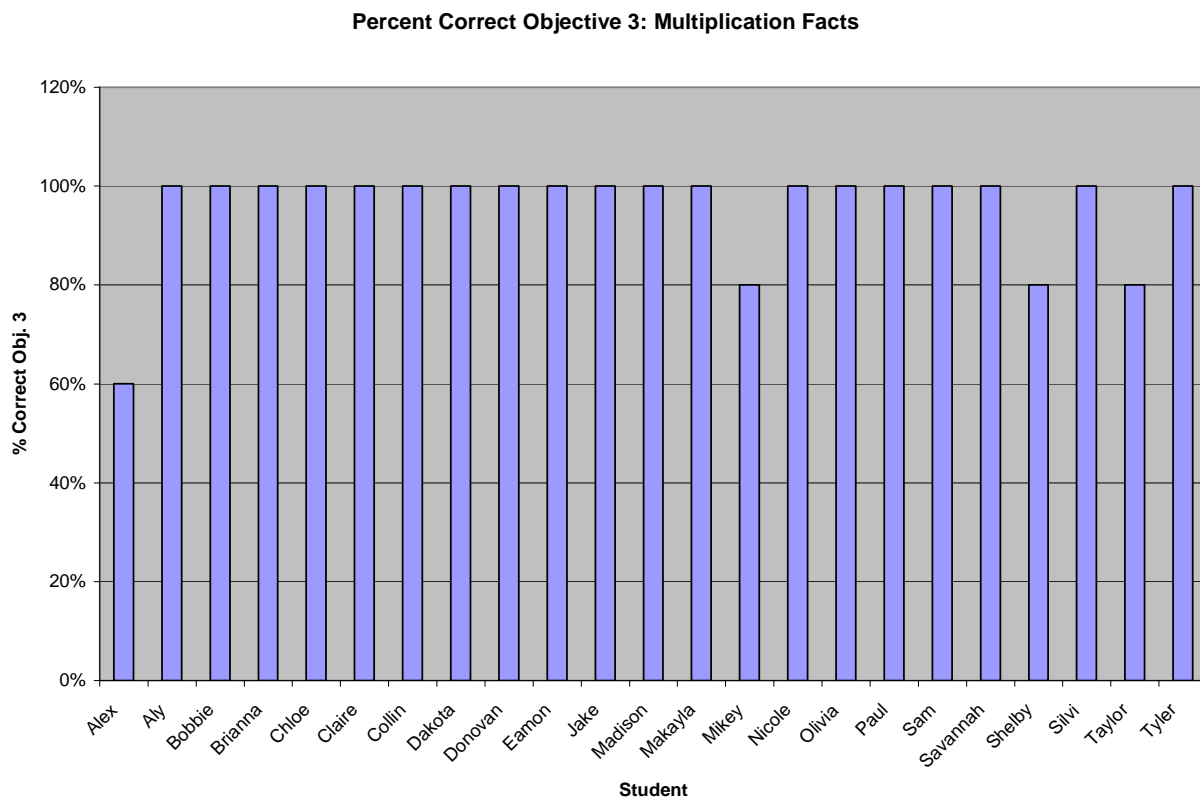


Figure 4. Percent correct for objective 3: solve basic multiplication facts.

Individual Student Analysis

I have selected Chloe for Individual Analysis. Chloe caught my attention from the first day I spent time in her classroom. Before any of the students arrived, Mrs. Burns pointed out certain students I should be aware of for their behavior or academic ability. She identified Chloe as energetic due to her ADD, a poor listener and a poor student. Mrs. Burns' disfavor for Chloe

was evident. When the students entered the room, Chloe was the first student to greet me, and was eager to tell me stories and show me her work throughout the day. I found her a rather delightful student who simply needed her energy redirected. After a few visits I learned more from Chloe about her life. She lives with her parents, who own a coffee shop. Chloe spends most of her evenings at the coffee shop clearing tables and working behind the cash register, rather than playing at home. I sense that Chloe's life is very unusual from most 10-year-olds.

I also selected Chloe for Individual Analysis because deeper analysis of her low average score for this Mathematics test may not be a reflection of her actual skill, but rather reveal inaccurate and invalid assessment through the test's questions.

Chloe received the lowest average score for her class on all three objectives, at 58%. However, I believe that this score is suspicious. When looking closer, I see that Chloe got five questions wrong, four of which were for Objective 2. Chloe made the mistake discussed earlier – on all four questions of Objective 2 she simply formulated the coordinates of a point by measuring up first and then across second, rather than the opposite way. She made the same mistake four times, thus earning four wrong answers. This part of the test is not valid, since a student can make essentially one mistake and receive a much lower score than warranted.

The fifth wrong answer Chloe received was for Question number 1 of Objective 2. This question proved problematic for many students, as they were required to: *Draw 12 balloons. Circle 1/3 of them. Put an X through 1/2 of the remaining balloons.* Chloe correctly drew 12 balloons, and put an X through 1/3 of them. Her mistake came when she put an X through half of the original 12 balloons (6) rather than half of the remaining balloons (4). Chloe obviously understood the concept of a fraction of a group, as she demonstrated by putting an X through 1/3 of the balloons. The ambiguity and trickiness of the second direction caused her to make a

mistake. Moreover, her mistake in the second part actually proves again that she understands the concept of a fraction of a group, since she did in fact demonstrate $\frac{1}{2}$. This awkward question does not accurately assess students on their knowledge of a fraction of a group, and therefore is not valid.

I have shown that although Chloe received the lowest average score in her class, her score may not clearly reflect her actual ability to complete the objectives. I have shown that Chloe actually understood the concepts behind all 5 questions that she got wrong. Chloe could formulate a coordinate point, as well as identify a fraction of a group. Her low score may be the result of invalid test questions, not necessarily Chloe's lack of skill and understanding. Had the test questions been more valid, Chloe's average score for the three objectives could rise from 58% to 92%.

Although the invalid test questions may be partially to blame for Chloe's low score, Chloe may also be at fault, and could benefit from further instruction. First of all, Chloe needs to be reviewed on the correct sequence of operations for formulating a coordinate point. She needs to be repeatedly instructed to measure across first and then up second. Perhaps Chloe would benefit from a short slogan to help her remember, such as "A is the first letter of the alphabet, so go Across first." Secondly, Chloe would benefit from instruction on test-taking skills. She needs to read all directions before she begins, and be sure to follow directions carefully since her wrong answer for Objective 2 was due also to her carelessness in reading the question.

In conclusion, this Individual Analysis of Chloe's test reveals that her low score is 1.) partially due to invalid test questions which did not accurately assess her skill, and 2.) partially due to her need for further instruction in the correct sequence for formulating coordinate points and careful test-taking skills.

Improvement of Instruction

These test results assessed student knowledge and skill of Objectives 1, 2, and 3, and so should be used to positively improve instruction. Students scored lowest on Objective 2, *identifying fractional parts of regions and collections of objects*. As evidenced by analysis of specific test questions, almost all students demonstrated proficient knowledge in *identifying fractional parts of region*, but need further help in *identifying fractional parts of collections of objects*. Further instruction should include groups of physical objects for the students to separate into fractional parts. For example, students can be given 12 blocks, and asked to separate into halves, thirds, and quarters.

Students scored slightly higher on Objective 1, *using coordinates to identify points on a grid*, but still would benefit from additional instruction in this area. Most students seemed to make the same mistake Chloe did in formulating a coordinate point by using the wrong sequence. Like Chloe, the whole class should repeatedly review the correct sequence until simply memorized, and may also be aided by a memorable slogan.

The class scored the highest on average for Objective 3, *solving basic multiplication facts*, but again additional instruction may be beneficial not only for the students who provided the incorrect answers, but also for improving speed of response for all students. Future instruction should begin with a demonstration of the procedure for calculating a multiplication problem, not just simple memorization. For example, students could be shown that (7×8) is calculated by counting total airplanes represented by 7 groupings with 8 airplanes in each grouping. As student proficiency in this procedure improves, students will no longer need to calculate in this way, but will have the solution memorized. Eventually, future instruction could

include multiplication fact games and class flash-card competitions rewarding students for speed and accuracy.

Teacher Feedback

I shared my Group and Individual Analyses with my cooperating teacher, Mrs. Burns. For the group, Mrs. Burns similarly expressed concern for the low 83% and 81% average class scores for Objectives 1 and 2, since these are skills in which fourth-graders ought to be proficient. She agrees that scores are skewed for Objective 1, since many students received zero points for four questions by making only a single mistake in formulating coordinate points, believing that all of her students truly can do it successfully. However, she feels frustration with her students since she specifically reminded them of the correct procedure to measure over first and then up second before they began the test. Although the students may be able to perform the skill correctly, the fact is that they did not. It is her belief that there is no flaw in the test, since the students who answered the question incorrectly did so even after given a deliberate reminder. She stated that student carelessness and neglect to listen to directions do not remove from a test's validity, and should always be taken into account.

Mrs. Burns feels that test invalidity was not the cause for low scores Objective 2 as well. For Objective 2, many students answered the first question incorrectly because they did not carefully read the directions. Although the students may have been capable of correctly identifying half of the remaining balloons, the reality is that when asked to do so, they did not. In her belief, students should not be given credit for "probably knowing the answer" and that student carelessness should receive the appropriate grade. To further explain her point, she gives the following example: "A person who incorrectly calculates the material requirements for a bridge which later crumbles will not get any credit for 'really knowing how to do it, but just

making a mistake this time.” While Mrs. Burns feels that further instruction on Objectives 1, 2 and 3 would be beneficial for all of her students, she admits that no amount of instruction will eliminate student carelessness in test-taking.

Upon sharing my Individual Analysis of Chloe’s test performance, Mrs. Burns was not surprised with Chloe’s score. Mrs. Burns was pleased with Chloe’s score of 100% on Objective 3, adding that Chloe’s energy has been an asset to her during the class’s high-speed multiplication fact competitions. As Mrs. Burns mentioned to me in the past, Chloe can be inattentive at times, and was clearly was not attending when deliberate verbal directions for coordinate identification (Objective 1) was given. Mrs. Burns feels that inattention was again the cause for Chloe’s incorrect answer for Objective 2. Chloe did not give enough attention to the question before answering by circling half of the balloons, rather than half of the remaining balloons. Mrs. Burns expressed to me the same deep concern I held, that Chloe’s work at her parents’ coffee shop negatively affected both her attention and the time she had available to spend on homework in the evenings. Mrs. Burns agrees that Chloe would benefit from further instruction, and planned to provide further instruction to the entire class, since class average for fourth-grade Proficient skills need to be above 90%.

Reflection

Although I would have disagreed prior to taking EDPS 340, the completion of this course and Student Learning Analysis (SLA) are essential to my success and excellence as an elementary classroom teacher. Previously, I had assumed that teaching and assessment involved simply taking directions and photocopying assessments from a textbook provided by the school district.

However, this particular math test that I administered to fourth-grade students at Farrand Elementary is evidence of the invalidity of many mass-produced standardized tests. While the objectives of the test are clearly printed, the test's questions do not accurately assess the objectives. For example, many students scored Question 1 of Objective 2 incorrectly because they did not clearly understand what the question required them to do. The test questions were developed by a large panel of educators from around the state of Michigan. Test questions were written to assess every Michigan fourth-grader, a very large and diverse group. Although I grant that this method is the best any panel can do for this task, I suspect that such large-scale testing provides inaccurate results. Classrooms of students throughout the state should not be tested uniformly, since they are not taught uniformly, nor are students uniform. Individual teachers, having more intimate knowledge of their students, can better develop test questions for their students, using state objectives as a guide. Had Mrs. Burns composed test questions for Objective 2 (and others), using both the language and process she had used to teach, and her students' learning characteristics to guide her, I believe that more of the students would have completed the objective correctly on the test. From the administration of this particular math test and the completion of this SLA, I have learned that high-quality teachers do not rely on mass-produced lessons and assessments for their students. Rather, high-quality teachers must compose their own objectives and assessments complementing their particular students in order to ensure validity. This new knowledge acquired from EDPS 340 will help me as a classroom teacher as I strive to be a high-quality teacher.

Besides learning about the necessity of validity in assessments, I also learned about myself as a learner from completing this SLA. As a learner, I tend to grasp new concepts quickly and easily. I enjoy learning and do not mind taking tests. However, as I administered

this fourth-grade Math test, I quickly became aware of my own ignorance to the experiences of others. Many of the fourth-grade students did not enjoy taking the test, evidenced by their nervousness and fidgeting. They do not enjoy learning as much as I do. Another characteristic I learned about myself is my own learning style. I learn by comparison and examples. After I corrected the tests, I reviewed some incorrect answers with individual students. I attempted to explain the correct answer using my own particular learning style, sometimes unsuccessfully. I learned that as classroom teacher I need to accommodate the varied learning styles of all my students.

I encountered a few problems as I completed this SLA assignment. As I graded the students' tests, in many instances I was unsure how to appropriately assign a grade. For example, I came across widely varied answers to the question, "Use your personal reference to estimate the length of this line in inches." Students measured the line by counting the number of times their bent index finger (their personal reference) fit on the line. The correct measurement was 6 inches, but student responses varied from 11 inches to 3 inches. Unsure which answers were acceptable, I solicited Mrs. Burns to appoint for me a range of acceptable values.

Another instance in which I was uncertain in assigning appropriate grades came when a student committed the same mistake multiple times over multiple questions. For Objective 2, students were given four problems, each requiring them to provide the appropriate coordinates for points given on a grid. If a student constructed each coordinate point by measuring vertically first and then horizontally second, he or she fundamentally answered each question incorrectly. However, I felt apprehensive subtracting four points for essentially one mistake. This dilemma raises an important question: Should grades be assigned based on raw performance, or based on

an assumption of the students' actual knowledge? This SLA activity has impelled me to deliberate this question as I prepare to be a classroom teacher.

I encountered other problems as I graded the test. Each time I came across an answer for which I was uncertain how to grade, I asked Mrs. Burns what score I should give. Her first response to me occasionally was, "Whose test is it?" After my reply, Mrs. Burns assigned a particular score by rationalizing, "That's what he meant," or "She did poorly on the rest of the test, too." Conversely, in other instances when Mrs. Burns was unsure of the students' knowledge based on his or her response, she would ask the student to come to the back of the classroom to complete the problem again. The student's second response was then scored. I found Mrs. Burns' process for assigning grades bias and inconsistent.

I would grade differently. To solve the problem of uncertainty in assigning appropriate grades, I have learned that rubrics are essential. After constructing a test, a rubric should be formulated that assigns a value to each defined quality of performance. A rubric makes test correction impartial and consistent.

In conclusion, both EDPS 340 and this Student Learning Analysis Activity have been beneficial to me personally and beneficial to my future role as a classroom teacher. Personally, I have learned about my own approach to both learning and teaching. I need to ensure that my teaching reflects the approaches and styles of my students, and not just my own. As a future classroom teacher, I have witnessed the necessity of validity in assessment. I will strive to be a high-quality teacher – one who ensures that assessments complement both objectives and students.

Note: Test and a scoring key attached.