

Comparing 6th Grade Science Classrooms: Inner-City versus Suburb

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ABSTRACT

Do teachers in the inner-city have different expectations of their students than teachers in the suburbs? Ethnographic studies of the classroom such as one by Wilcox in 1982 suggest they do. Wilcox describes education as "primarily a process of cultural transmission". In other words, schools in a particular setting or neighborhood aim to instill in their students the cultural norms and behaviors accepted and expected in that setting. This project is an ethnographic study of two sixth grade science classrooms; one in an urban inner-city Detroit, Michigan neighborhood and one in the neighboring suburb of Dearborn. The study examines the way the two classrooms are run by the teachers and their teaching styles by comparing the types of assignments that are given to students and the implications they have on the students' learning development. Other factors such as a comparison of school funding per pupil and the effect it has on the availability of resources necessary for learning in each classroom were also examined. We found that the Dearborn school students learned how to work individually and in groups whereas the Detroit school students learned only how to work in groups. We also found that Dearborn students were encouraged to read out loud to the class individually whereas Detroit students were often read to by the teacher.

I. INTRODUCTION

There is a large gap in standardized test scores of inner-city Detroit students and those of the surrounding suburbs. The school funding disparities between the urban and suburban school districts are sharp: For example, a wealthy suburban school district such as in Bloomfield Hills, Michigan, where the median household income is \$152,752, spends more than \$12,000 per student. This is in sharp contrast to a Detroit school district, where the median household income is \$40,986 and \$7,259 is spent per student [1].

The data for our study comes from observations of two science classrooms, one in an inner-city Detroit public school and the other in a surrounding suburb. Students

at the sixth grade level were observed because sixth grade marks the start of the students' independence in a school environment. At both schools, sixth grade (the beginning of junior-high, 6th-8th grade) was the point at which students moved from one class to the next on their own. For example, some students had four minutes after their science class to report to their math class on their own. Students' schedules were no longer the same. This is a major shift from an elementary school environment (kindergarten-5th grade) in which the students either spent the whole day in a single classroom with a different teacher coming in for each subject or went to another classroom under the supervision of a teacher.

This study is concerned with how this gain of independence by students at the sixth grade level was countered in the classroom by the teacher. Was this gain in independence supported by an emphasis in independent reasoning in the classroom as well? [2-6]

II. METHODS

For this ethnographic study, we observed each of two classrooms five times, on five different days. The observations occurred the first or second class period of the day at each school. This was always between the hours of 7:45 am and 9:00 am. At each school the class period lasted 55 minutes. Observations and notes detailing the teacher's dialogue and the students' actions for the entire class period were recorded. Teachers also were interviewed. The interview with the Dearborn school teacher lasted thirty minutes whereas the one with the Detroit school teacher lasted twenty minutes. One was more expressive and gave longer and more drawn out answers than the other.

III. THE SCHOOLS

The Detroit public school studied consists of grades sixth through eighth. It is located in a poor neighborhood where the average household income is \$40,000 per year. Most of the residents are African American (47%), Hispanic (31%) or White (21%) [1]. There are many abandoned buildings surrounding the school. The school building itself is not well maintained nor is it up-to-date. Graffiti covers the outside bricks of the building. Inside, paint is chipped and pieces are falling off; some lockers are jammed with signs of wear and tear. The Detroit classes observed had 18-20 students per class—the state average for Michigan is 25 [7].

The Dearborn public school studied is located in an upper-middle-class neighborhood. The average income is \$61,953 per year. Most of the residents are Middle-Eastern (57%) or White (34%). There are no abandoned buildings surrounding the school. The school building is well maintained with no graffiti covering the walls, no signs of peeling paint or damaged lockers. The school does not show signs of

wear and tear. The Dearborn classes observed had 22-23 students per class [8-9].

IV. BELLWORK

a. Detroit Observation

In the Detroit classroom, bellwork was an assignment to be done by the students as soon as class begins. On the way to their seats, students stop by a blue basket containing their notebooks (made by the students at the beginning of the school year). This notebook is where students respond to the bellwork question or assignment of the day written on the board. Some examples of bellwork tasks given to students during the observation days follow: Day 1: *What living things are in our school yard? What is a habitat?* Day 2: *List the qualities you believe a good scientist has. Which of these qualities do you think is most important today?* Day 3: *Endangered animal worksheet.* (A substitute teacher was present on this day.) Day 4: *Explain the difference between a primary consumer and a secondary consumer.*

As soon as the class began, the teacher would tell the students to start their bellwork assignment. For example, once she said, "We need to be working on our bellwork assignment." Sometimes she did this as she walked around the classroom. At another instant when she noticed two students talking to each other she said, "Uh...I don't like how some of us are not doing what we're suppose to—like bellwork." When the two students still did not stop talking and proceed with their bellwork, the teacher said, "I wonder if everyone wants to write an essay in here. Huh?" and then as she stood before the two students who were talking she added "Both of you?"

After students have completed their bellwork the teacher lead a class discussion of the bellwork topic or question. Four or five students typically raised their hands to answer questions. The teacher would either call on them, or give the answer if no one raised his or her hand.

b. Point of View of the Detroit Teacher

An interview with the teacher outlined the role bellwork plays in the classroom. Detroit students are allotted

points for completing bellwork assignments. As the teacher explained, “[Students] get points for doing their bellwork.” However, not all bellwork assignments are graded. According to the teacher, “Out of the five assignments they [the students] do (Monday through Friday) I pull out two of them and I grade those.” The remaining three assignments are not corrected. If a student misses a bellwork assignment and if that assignment was not the one chosen to be corrected by the teacher, then the student does not face a penalty such as a loss of points. If the missing assignment was the one the teacher chose to correct, then the student loses points.

Bellwork makes up a small percentage of students’ final grades. According to the teacher said, “It’s a part of their grade...about 5% of the grade....”

c. Dearborn Observation

In the Dearborn classroom, bellwork is also done by students as soon as they enter class at the beginning of the class period. The bellwork question or assignment of the day was posted on the board. Some examples of bellwork tasks given to students during observation days follow: Day 1: *How do scientists group plants?* Day 2: *List three functions of roots and stems.* Day 3: *What part of the plant are you eating? (Students answered using carrots, potatoes, chick peas as examples of the edible parts of plants.)*

Students completed their bellwork on a sheet of paper which they later inserted into a folder used to keep all their bellwork assignments. During two out of five observations, the teacher had to tell students to get started on their bellwork instead of talking to each other. Once she said, “You guys, we cannot start the day without your bellwork!” The students then started the bellwork, and usually took five to ten minutes to complete the assignment. After the teacher noticed that most of them had finished their bellwork, she always proceeded to discuss the bellwork in class. She would read the question out loud, and students would raise their hands. She would then call on a student to provide the answer to the question. During all observations, at least five to ten students raised their hands to answer each question.

d. Point of View of the Dearborn Teacher

In an interview the teacher explained to the purpose of bellwork. She said, “Bellwork is [assigned] to engage the students [and] to get them thinking.” It is aimed at starting the student’s thought process for the class period. Bellwork is also used as a review of a past topic or a lead in to a new topic to be covered in class. The teacher said that bellwork is “a review of what they (the students) did yesterday or an introduction...of what we’re going to be introducing today.” Bellwork is not graded on a scale from A to F. However, a student is allotted points for doing the assignment. What the teacher is looking for is not necessarily the right answer but evidence that the student attempted to do the assignment. She looks through their folders at all the bellwork assignments after class or in between classes. The teacher said that the students are “expected to do it (bellwork) and are given points for completing the assignment and giving it some thought.”

V. IN-CLASS ASSIGNMENTS AND ACTIVITIES

In-class assignments are assignments done by the students while they are with their classmates, during the class period. Usually these assignments are required to be turned in at the end of the period. However, at times if some or most of the students have not completed their assignment, they are allowed to take it home to complete. In-class activities often involve activities that students and the teacher did together, such as class discussions and readings.

a. Detroit Observation

Some in-class assignments given to students at the Detroit classroom included drawing what they saw in parts of a neighboring field, doing a worksheet identifying insect body parts, and making a food web. Each observation day, the teacher told the students that she wanted the assignment turned in at the end of class. However, only the drawing illustrating the parts of the field was collected before the students left. After noticing that most students were not able to complete the other

two assignments in class, the teacher decided to allow the students to complete them at home. At times when it seemed like some of the students had completed their in-class assignment for the day, the teacher would instruct these students to begin their assigned homework for that day.

The assignment for which the students had to go outside and draw the surroundings of the school required them to work in groups of four. Students were directed outside to a field neighboring the school. Each group was assigned a designated space in the field. Each student in the group had to draw what they saw in their designated space. This included grass, dirt, and insects.

When the students did the worksheet identifying insect body parts they were guided by the teacher throughout the process. The worksheet was filled out as a class with the teacher telling the students the correct answers. For each blank on the worksheet, the teacher would ask the students for the answer. If no one raised his or her hand, she would give the class the correct answer. If someone did raise a hand and give the incorrect answer, the teacher would provide the class with the correct one.

The food web assignment required students to draw a food web depicting which animal was eaten by what predator. The teacher asked everyone to listen as she explained how to make a food web. Before she began to give her instructions she said, "Listen carefully I'm only going to say this once." However, by the end of class, the teacher had repeated the directions a total of twelve times. This included giving directions to the class as a whole and providing instructions and explanation one on one to certain students.

b. Dearborn Observation

Some in-class assignments given to students at the Dearborn public school included finding and writing down definitions to scientific terms and making diagrams of the stem of a plant, labeling it and describing its functions. The students had to have the assignments completed and ready to be turned in before the class period ended. When some of the students had completed their in-class assignment, the teacher would

instruct these students to begin their assigned homework for that day.

An example of an in-class activity is reading together as a class. For this activity, each student opens his or her textbook to the particular section being read that day. The teacher calls on a student to read a couple lines or a paragraph. As the student reads out loud, the rest of the students are expected to follow along in their own textbooks. After the student finishes, another student is chosen to continue reading. Sometimes the teacher would discuss what has been read with the students before calling on the next student to read.

Some in-class activities involved students working in groups. In one such activity, students worked in pairs to design a three dimensional flower using materials they brought from home. Only those students who had remembered to bring in an item were allowed to participate in this activity. The students who forgot or did not bring in any materials for the project were not allowed to participate. These students spent the class period completing a worksheet. Each three dimensional design had to have parts representing the petals, the pistil, the stamen and the stem of the flower. Students used construction paper, pipe cleaners, glitter, and macaroni as some of their model-making materials.

The teacher told the students that this was an in-class activity and must be completed before everyone left. However, after noticing that a couple groups of students were not finished with their model at the end of the class period, the teacher permitted these students to complete their models at home and then bring them to class the next day. She also allowed these students to take some of the materials like construction paper and pipe cleaners home with them to help complete their project.

Another example of an in-class assignment was completing worksheets assigned by the teacher. One example of such a worksheet is called a *directed reading sheet*. Each student fills out his or her own worksheet by searching the text book for answers to worksheet questions. If the students had trouble finding an answer, they would either raise their hands in an effort to get the teacher's attention so that

she could come over to assist them or they would ask their table partners for help.

VI. DIFFERENCES IN ACTIVITIES

Students in the Dearborn classroom were sometimes instructed to write down definitions to scientific terms pertaining to the topic being studied. Once definitions were found in the glossary of the textbook, they had to be formulated in the students' own words and then written down. The Dearborn teacher believed that this exercise increases the breadth of the students' science vocabulary. She said that with this activity, "We try to introduce more vocabulary and talk more like scientists." She further emphasized that the students "are not allowed to copy the definition out of the glossary in their science book." The definition must be in the students' own words. The teacher said, "Whatever you just read, what does it mean? You have to read it and write it and try to put that (which you wrote) in your own words." She also said that sometimes she asks the students to read their definitions out loud to check and see whether or not it is in their own words. She said, "I pick on them and [if the definition is exactly like the one in the book] I go 'Gee that sounds like the book to me'."

The Dearborn teacher said that one of the reasons she makes students read out loud in class is due to the language barrier faced by some students. A large fraction of students in the Dearborn observation class were of middle-eastern descent; 56% of students in the Dearborn school district are of middle-eastern descent [8]. Many of these students speak Arabic, not English, at home. Because the teacher thinks these students might not be able to read or comprehend the material well if they were told to read it on their own, she has the class read as a group and then she discusses what has been read. She said, "I never assign text material to be read independently...without going over it in class. Usually we read it together in class first." She went on to say that she expects the students to reread the material on their own outside of class. She said, "I always remind my kids that just reading it with me in class is never enough." The teacher expects the students to read a certain amount from their textbook outside of class:

"I only assign three to four pages at a time or one section."

The directed reading sheets—sometimes used as in-class assignments in Dearborn—were aimed at getting students to go over the chapters in the textbook by themselves. This is because the answers to questions on this worksheet can only be found in the book. The Dearborn teacher said that the "Directed reading sheets force them [the students] to go back and read the text." The teacher said that all in all the students end up reading a chapter at least three times: "We read it together, [they each] read it over [alone], and then there's always some assignments that forces them to reread through."

Group activities, such as making the three dimensional model of a flower, involved two to four students working together. The Dearborn teacher said, "I do a lot of group activities." Sometimes groups of two students are instructed to prepare a small presentation on a particular section of a chapter from the book. Then each group teaches a particular section to the class. This activity is called "Think Pair Share." For most group activities the teacher prefers to group students in twos. She said, "If I can, I'll just stick to pairs. Whenever we're doing a lab...it'll be four." Labs require students to carry out an experiment. On the day of a lab the students are divided in groups of four and each group member is given a specific task. The teacher said, "each [student] has a position." One student is also designated as the leader of the group. "I give a lab coat to one person so they feel really important with that lab coat because they're the leader of that particular lab or activity. So, they run the show."

The students are also encouraged to help each other as they work in class on their directed reading sheet. The teacher said, "They [the students] are encouraged to work with their table partners on their directed reading [worksheet] if they can't find an answer. I always teach don't give anyone a particular answer but show them where you found it in their text." This means that the students are not allowed to copy answers directly from another student's worksheet. However, students are expected to help or direct each other to the location where the answer can be found.

Students taking part in group activities and then willingly sharing, presenting, and reading in front of the class demonstrates a high level of class participation. The Dearborn teacher is satisfied with the level of class participation. She emphasized that group in-class activities help students who are afraid or too shy to speak in front of the class open up and express themselves: "A shy kid may express his or her opinion in a group setting and it [shy student's opinion] may come out through a spokesperson when they present."

During our observations, the Detroit class, in contrast to the Dearborn class, never read together as a class. The reason for this could be a lack of updated textbooks. The Detroit public school teacher told me, "To tell you the truth, the textbooks that we use here in Detroit are ten years old." The teacher believes they are so old that they are not worth reading from. To make up for the lack of updated textbooks, the teacher makes copies of newer text and hands them out to the students. She said, "I have newer material I give them."

On the other hand, the Dearborn classroom had textbooks published in 2005 for each one of its students. In fact, the Dearborn district is considering allotting two textbooks to each student, one book for home and one for class.

VII. REVIEW

Detroit students were never observed to read in class. None of the Detroit students were ever called upon by the teacher to read out loud. Even though the Detroit teacher made copies of newer material for her students to read, no students were ever asked to read it out loud during the period of observation. This may well affect the Detroit students who miss an opportunity to improve their reading skills.

While the Dearborn school district has enough money to consider assigning two textbooks to each student, the Detroit school district lacks even sufficient money to assign one textbook to each student. The amount of money spent per student by the Detroit public school district for the 2005-2006 school year was \$7,259.00; \$8488.00 was spent per student by the Dearborn school district. The Dearborn school district

spent \$1229.00 more per student than the Detroit school district [1].

Most if not all the assignments done by the Detroit school students involved working in groups. For example, the habitat drawing assignment was to be completed in groups of four, the insect body parts worksheet was completed as a class with the teacher verifying the correct answers. When working on in class worksheets, the Detroit students were told specifically by the teacher to "ask your partner for help if you get stuck." If the students were unable to answer a question or fill in the blank on their worksheets, they were free to ask their partners for "help".

On the first day of the Detroit observation, the teacher did not ask students any questions. She did not question them about the material they were studying. Instead, she gave students step-by-step instructions about how to do their assignment. Students were told to put their first and last name, date, and homeroom on the upper right hand corner of the paper. They were told, "Listen and do exactly as I say" by the teacher.

During only one of the five observation sessions at the Dearborn school did the students do group assignments. This was when they designed the three dimensional flower. The rest of the assignments were to be completed individually. The Dearborn students were given more opportunities and were encouraged to work on their own far more often than the Detroit students. While the Detroit school teacher seemed to stick to a group assignment strategy, the Dearborn teacher used both individual and group assignments as part of her teaching strategy. The Dearborn strategy helps students learn how to work independently and in groups whereas the Detroit strategy can only teach students how to learn and work in groups.

The seating arrangements for the students were nearly the same in both schools. In the Detroit classroom, four students sit facing each other; two students on each side of one table. In the Dearborn classroom, four students also sit together in one cluster consisting of two tables that are placed perpendicular to each other. Two students sit side by side at each of the two tables. They do not sit face to face. When a

student in the Dearborn classroom is having trouble with a particular assignment or is having trouble understanding directions, he or she is specifically told by the teacher, "Come to me if you have questions."

VIII. BELLWORK ANALYSIS

In both classrooms bellwork is an assignment done by the students as soon as class begins. Both teachers use bellwork topics or questions as a review of a subject or topic already covered on a previous day or as a lead into a new topic. Both teachers also think bellwork helps start the students' thought processes to keep them engaged for the rest of the class period. Both teachers discussed the answers to the bellwork with the students after the students had finished doing the bellwork on their own.

Students in both classrooms were required to write in complete sentences. Writing in complete sentences could also be useful when students take standardized tests that require them to write essays. Perhaps the extra practice that could come from doing bellwork assignments in complete sentences could lead to better performance in English and writing standardized assessments.

In 2005, 29% of graduating seniors from the Detroit public school district met or exceeded writing standards for their grade level, compared to 46% of graduating seniors from the Dearborn public school district (MI Dept. of Education 2004-2005). Perhaps the difference in strategy and the amount of emphasis given to developing writing skills between the two teachers plays a role in the disparity between the writing scores of the students from the two districts.

IX. CONCLUSION

Bellwork assignments at both schools aimed at starting the student's thought process for the day. These assignments acted as a review or lead into a subject already covered or planned to be covered in class. Bellwork assignments of students in the Detroit school are not required to be in complete sentences. In the Dearborn school students are required to write their responses to bellwork in complete sentences. This difference in requirement or

strategy of the teacher could explain, in part, why the Detroit reading scores are lower as compared to the Dearborn reading scores.

At both schools the teachers are flexible in letting students take home their in-class assignments if they are not able to complete them in class. However, the Detroit school in-class assignments are more group oriented. The students receive a lot of guidance from the teacher. Independent learning and thinking are not as emphasized as group learning in Detroit.

At the Detroit school, students are helped directly by the teacher to answer questions in assignments. The Dearborn teacher tells her students, "Don't give anyone a particular answer but show them where you found it." The Dearborn teacher emphasized the importance of partner and individual assignments. This developed student skills as group and independent thinkers. Students were never allowed to copy definitions straight from the text when learning new vocabulary. They were encouraged to think independently and formulate the definitions in their own words. Students were also encouraged to read. This reading took place in the classroom and the student was also expected to read the textbook chapter at home or by themselves. The Detroit students lost this opportunity to read and improve their reading skills. The Dearborn students were also asked to work in groups to summarize a section from the text book and then teach it to the class in a presentation. The Detroit school students did no such thing.

A difference in teaching strategy and a lack of funding at the Detroit school leaves students with more experience in working as a group and a lack of experience in individual reasoning and in reading opportunities. Dearborn schools have enough money to provide updated textbooks for each student which gives students more opportunity to read. The Dearborn teacher's strategy allows students to develop both their group and individual learning abilities along with plenty of reading opportunities to improve reading ability.

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