

Will “Peer Teachers” have an impact on student plant identification test scores?

Action Research Project

AEE 601



Problem of Focus- Low Grades on Plant Identification Tests, in an Otherwise Successful Horticulture I Class

Will “Peer Teachers” have an impact on student plant identification test scores?

This action research project was conducted in the Horticulture I classroom I was student teaching in for eight weeks at a high school located in in the south eastern area of the United States. I was under the supervision of an experienced horticulture teacher who has been teaching at this high school for more than 20 years. The teaching methods I used were the same methods this teacher has been using for years, until my fifth week teaching the class. During the fifth week, I added two “peer teachers”, which are students who taught portions of the lesson together. I was hoping the peer teachers would not only take a more active role in their own education, but might also serve to motivate and engage the rest of the class. I was optimistic that the plant I.D. test scores might also improve.

The class consisted of twenty four students, twelve of which were male, and twelve of which were female. There were seven twelfth graders, three eleventh graders, eight tenth graders, and six ninth graders. There were thirteen Caucasian students, six African American students, and five Latin American students. Three students were identified as having a current IEP (Individualized Educational Plan). Another student, a Caucasian female, in the twelfth grade, was identified by the NC Wise data base system as being homeless. She missed the first three weeks of class. Two other students, showed up to class less than half of the time. Three out of the five Latin American students verbally communicated to me that they disliked and/or had

difficulty reading and writing English during a reading/writing assignment. None of these students had ever taken any type of agriculture class before.

Method of Teaching Plant I.D.

Plant Identification using scientific nomenclature is a major part of the curriculum in the Horticulture I class. Each week, six new plants from the “Official Plant Identification List from the NC FFA Introduction to Horticulture Career Development Event” are introduced, along with their scientific names, common names, landscape uses, cultural requirements, and a description of fruit, flower, and foliage. Fridays are always plant ID test days, and students are expected to identify each plant by its common name and its scientific name, as well as its landscape use. For example, a marigold would be identified as both an African Marigold and *Tagetes erectus*, its scientific name. Students are also expected to name its main landscape use, which in the case of the *Tagetes erectus*, is a bedding plant. Each Friday, six or sometimes seven new plants are added to the students’ knowledge base, and a test is given on those plants the following Friday, giving the students one full week to learn to identify six or seven plants.

The Plant Identification tests are conducted as follows:

- Students are given clip boards to attach a copy of the Official Plant Identification List. The Official plant list contains both the scientific and common name of each plant. This list is used as a test.
- Plants that have been reviewed in class are chosen by the teacher and displayed in a room in a separate building from the primary classroom, prior to class.
- Each plant or plant sample is assigned a number on eight and a half by eleven inch sheet paper, written largely in a bold marker.

- The students have one minute to identify each plant on the list. The corresponding number of each plant is written into the small blank beside the correct plant on the list. One of the plant's landscape uses is written in the space beside the plant name.
- As the number of plants increases weekly, the number of plants tested on increases, to a maximum of twenty-five plants. For example, after the fifth week, the students have learned thirty plants, but they will only be tested on twenty-five. It is the teacher's discretion to choose which plants will be on the test. The previous week's plants are always included to ensure the students are tested on every plant.

After the tests are turned in, copies of the new PowerPoint slides are handed out to each student, and six new plants are introduced by a live introduction of the plants by a walk through the greenhouses, by a walk across campus, or both (depending on where the plants are). Students listen to the presentation given by the teacher, and take small samples of the plants that they are asked to tape to their notes in the classroom. The students then go back to the classroom and engage in a colorful and descriptive PowerPoint presentation of the same plants they were introduced to on the plant walk. The PowerPoint contains the common name, scientific name, height, spread, fruit, flowers, landscape use, cultural requirements, and several pictures of each of the six plants. Students are encouraged to take notes and ask questions.

On Monday, the same plants are shown again via PowerPoint. The PowerPoint presentation review lasts about 15 minutes, and other Horticulture I material, such as "Horticultural Careers", or "Plant Taxonomy" is discussed from Monday through Thursday. There is also a greenhouse

lab included in the ninety minute class period, which lasts from twenty-five to thirty-five minutes. So the daily class lesson plans follow these guidelines:

Monday- PowerPoint review on Plant I.D., 15-30 minutes

Curriculum material other than Plant ID (including activity or classwork), 20-35 minutes

Greenhouse lab, 25-30 minutes

Tuesday- Review current week's plants and plant samples inside classroom for 15 minutes

Curriculum material other than Plant I.D., 40 minutes (possible assessment of material)

Greenhouse lab, 30 minutes

Wednesday- Review the current week's plants and plant samples inside classroom for 10-15 minutes

Curriculum material other than Plant ID (including activity or classwork), 40 minutes

Greenhouse lab, 30 minutes

Thursday- Review current week's plants and plant samples inside classroom for 10-15 minutes

Curriculum material other than Plant ID (including activity or classwork), 40 minutes

Greenhouse lab, 30 minutes

Friday- Students are given 10 minutes to study their notes in preparation for the Plant ID test.

Plant I.D. test takes up to 25 minutes.

PowerPoint slides handed out, and plant walk begins. About 25-30 minutes.

Students return to classroom and are given a PowerPoint presentation of next week's plants.

About 20 minutes.

Problem- Falling Test Scores

Four weeks into my teaching practicum, I noticed that as each week progressed, many students' Plant I.D. test scores began to show a noticeable decline. The grades went from an average of 90.8% when there were only six plants on the test, to 75%, when there were 25 plants on the test. The only obvious difference between week one and week four were the additional plants. There were some issues with attendance, which may have been a factor for some students. Classroom management was ruled out as a problem as I did not have any serious behavior issues in class, with the exception of some excessive talking from two students whom I had to separate. These students were among those who were doing poorly.

I asked the students in Horticulture I how many of them had actually signed up to take the class, and discovered that many of them were placed there by the guidance counselor. The students who did not actually choose the horticulture class were the ones who were performing the most poorly. I was also concerned about my homeless students' ability to study these plants if her home life was unstable. I considered possibilities that would maximize her time in my class. I tried to think of a way to get these students more engaged in class in order to improve their test scores. I was already very impressed about how well the class interacted with one another over all, and decided to see if more peer interaction would encourage deeper class engagement and increase motivation to learn plant names and characteristics.

Review of Literature

I spent a considerable amount of time researching literature concerning peer teaching. Almost every article I found reflected a very positive view of the use of peer teaching in the classroom. This class was a diverse group of students, and there was a need to motivate students to study the plants. I was hoping peer teaching would help keep the class engaged and motivated. According to Maheady and Gard, contemporary teachers need instructional practices that are (a) powerful enough to meet the needs of a rapidly diversifying student population, (b) feasible to implement on a classwide basis, and (c) socially acceptable to them and their pupils. These authors classify peer tutoring as Classwide Peer Tutoring, or CWPT, and have found it to be a successful way to accomplish a, b, and c. (Maheady, Larry; Gard, Jaime, n.d.)

The literature also revealed that peer teaching is not a new concept. In fact, forms of peer teaching go all the way back to ancient Greece when student leaders, called *archons* helped teach their peers. During the nineteenth century, teachers would use older students to drill younger students. (“Peer Teaching: To Teach Is To Learn Twice. ASHE-ERIC Higher Education Report No. 4, 1988.” n.d.) Not only is the experience helpful to the students who are being taught, but it is also very beneficial to the student who is doing the teaching. “A student’s colleagues often represent the least recognized, least used, and possibly the most important of all the resources available to him.” (“Peer teaching in higher education: A review - Springer,” n.d.) I took this idea into consideration, and tried to formulate a way to carry on the project so that I could effectively test out this idea.

I recalled that in my preparation and review to teach this class, I had learned, or re-learned information about a few of the plants, and thought it would be helpful to the students to do the same thing. According to Neal Whitman, “Peer teachers benefit because in reviewing and organizing the material to be taught, student teachers gain a better understanding of the subject”

(“Peer Teaching: To Teach Is To Learn Twice. ASHE-ERIC Higher Education Report No. 4, 1988.” n.d.). In addition to believing that this practice could help the student assistants, the reading I did seemed to indicate that this cooperative-type learning situation could also help motivate and keep the class engaged. In her book *Tools for Teaching*, (1993) Barbara Gross Davis gives some ideas that have shown to increase student motivation. During this action research project, these tips were incorporated into the daily routine:

- Give frequent, early, positive feedback that supports students’ beliefs that they can do well.
- Ensure opportunities for students’ success by assigning tasks that are neither too easy, nor too difficult.
- Help students find personal meaning and value in the material.
- Create an atmosphere that is open and positive.
- Help students feel that they are valued members of a learning community.

(“MOTIVATING STUDENTS,” n.d.)

I was hoping to merge these ideas together by allowing students to become more active participants in the learning process. I was careful to relay the message that everyone was capable of learning the plants. Although some of my students were much less confident in their ability to learn the plants, they were treated as though they had the same potential to learn the plants as everyone else. The class was told to respect each student who came to the front of the class as though they were the teacher.

Procedure

In addition to the methods we had been using the first four weeks of the semester, two students were added each week to orchestrate activities as peer teachers. The peer teachers created a PowerPoint presentation together that included all the information we typically discussed in class, such as scientific and common names, landscape uses, cultural requirements, and growth habits. The peer teachers were also asked to write scientific names, common names, and landscape uses of each of the six plants on the chalk board every day. Then they would find the plant in the green house or take a sample from a plant on campus. They would do a plant ID review with the class every day Monday through Wednesday, and Thursday they'd show their PowerPoint to the class. I was hoping that this would raise the students' overall test scores. The homeless student was a student teacher during the first week, since I was concerned with the fact that she had missed the first three weeks of class, and probably had difficulty studying due to the instability of her situation. I chose another female student who was also having difficulty with plant ID to be her partner. After the first week, students began volunteering, so I allowed students to volunteer for the roles, instead of choosing them based on test scores or other factors.

Student Engagement

I noticed that certain students were more engaging to the class when they gave their presentations than others. The most engaging student assistants were the ones who had a sense of humor. One student in particular, a Harnett county native, had a lot of fun trying to pronounce the Latin names of the plants in very unorthodox ways because he couldn't quite get the pronunciation correct. This caused the class to respond in a light-hearted, humorous way. The students enjoyed correcting him, and were amused at the same time. He didn't take himself very seriously, and seemed to sincerely enjoy the class' response. It was positive because the class paid attention to him, and really enjoyed his personality.

If a student was confident about the information they were sharing with the class, they were more engaging. One student in particular, came up with interesting ways to remember scientific names of plants using imagery and similes. For example, for the *Pinus strobus*, or Eastern White Pine- she told the class to think of a strobe light being a bright white light which would help them remember that this was a White Pine, and not a Loblolly. She also had the class remember *Aucuba japonica* by replacing the words “Akuna Matada” with *Aucuba japonica*, to sound like the song from the Disney Movie the Lion King.

The peer teachers that had good voice quality, enunciated well, were assertive, and knowledgeable were also effective at keeping the class engaged. Peer teachers who were shy, quiet, or didn't seem to know the plants had the opposite effect on class engagement. In fact, I noticed a lot more talking out of turn by the class during reviews given by peer teachers with these qualities.

Reflection

My class was a very diverse group of students, not only because there were students from ninth to twelfth grades, but also because there were students who were bilingual, students who had IEP's, students who were academically gifted, and students who varied in their interest in horticulture. I was hoping to bring together this group of students, and I believe the class as a whole did experience cohesion as a result of this series of activities. Students interacted with each other more, and developed a sense of connectedness to the class and to each other.

Although there was no significant rise in the test scores, the plants the students were learning did increase, and the students maintained their average test scores despite the fact the tests increased in difficulty every week. There was a sense of pride on the student assistants' faces when they

were the ones who knew plant information the class did not. The class smiled more and was more engaged. The feedback I got from the student surveys was in favor of using student assistants. Student surveys revealed that 76% of the class agreed that using the peer teachers helped them remember plant names and landscape uses. 23% said it was not helpful. Students were also asked to rank four activities to determine which activities were the most helpful to them in learning the plant names and characteristics:

Ranked 1st- Peer Teachers standing at the front of the class room holding plants while naming and describing them

Ranked 2nd- Peer Teachers labeling the plants with scientific names, common names, and landscape uses

Ranked 3rd- Peer Teachers sharing their PowerPoint presentations

Ranked 4th- Peer Teachers writing scientific names, common names, and landscape uses on the chalkboard

Plant I.D. weekly test scores for each student

Students	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Student 1	96	88	101	99	92	92	100	99
Student 2	98	90	92	96	77	72	100	91
Student 3	90	71	77	56	50	Absent	64	49
Student 4	94	88	50	82	72	68	44	74
Student 5	88	Absent	61	36	60	76	79	39
Student 6	78	45	82	Absent	76	32	33	76

Student 7	97	99	99	99	96	96	100	100
Student 8	98	99	97	99		96	89	96
Student 9	Absent	Absent	59	Absent	Absent	48	48	69
Student 10	Absent	Absent	55	Absent	76	Absent	20	76
Student 11	93	72	65	62	62	8	80	43
Student 12	100	79	69	76	Absent	76	80	78
Student 13	Absent	75	54	59	97	47	96	100
Student 14	96	93	84	82	84	Absent	84	80
Student 15	98	97	90	91	86	72	100	91
Student 16	84	57	59	56	44	28	100	58
Student 17	94	91	88	91	91	88	92	96
Student 18	Absent	Absent	76	80	Absent	44	100	90
Student 19	80	34	71	62	73	48	90	65
Student 20	82	55	51	42	Absent	44	40	23
Student 21	98	73	77	Absent	56	74	54	83
Student 22	93	99	84	78	76	84	76	79
Student 23	77	74	76	75	76	69	60	64
Student 24	82	69	58	79	N/A	N/A	N/A	N/A
AVG GRADE								
	90.8	77.4	74.0	75.0	74.7	63.1	74.8	74.3

To Improve Practice

There are several things I would do differently in the future. The first change I would make would be to put a poorly performing student with a higher achieving student, since they have personal interaction with each other daily and the high achiever would likely serve to tutor the other. This would probably eliminate the idea of students volunteering for the positions. I would also discontinue providing handouts for the students to use for notes, instead requiring them to write out each scientific and common name themselves. This might help them remember the names of plants. The last change I would make would be to do a comprehensive test every other

week that included every plant the students were introduced to in order to get a better picture of the students' knowledge of the plants.

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