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**Advantages of
Homogeneous Collaborative
Grouping for Algebra Students**

Introduction

I have taught at Algebra at several different schools. Over the years I have seen the curriculum make some changes and the method of instruction changed. The most common and preferred method of instruction in my school district is to use mainly cooperative or collaborative groups of students. Research has shown this to be an effective method of delivery for today's students. Research has also shown that working in collaborative groups is a skill desired by the business world. I have found varying the method of instruction to be valuable for all students, including small group instruction, large group instruction, cross age teaching, individualized instruction, and other methods to address the various learning styles of the students I teach.

I have found using collaborative/cooperative groups to be successful for most of my students. The current curriculum and the adopted textbook expects it to be the dominate method of delivery. The teachers guide with the curriculum explains how to create heterogeneous groups of students. This is also reinforced in training seminars. I have used heterogeneous grouping for the past 10 years and found it successful when I was teaching sixth grade math to gifted students. Then I was reassigned to teach Algebra to gifted eighth grade students.

The past four years I continued to use heterogeneous groups and started to observe that the groups did not seem to work well with my lower performing Algebra students. I talked with the students, their parents, and observed more closely their participation in class to determine how I could help them improve in their Algebra skills. I concluded that in heterogeneous groups they became *passive* learner. They were unsure of their ability, so when the groups would discuss and practice Algebra concepts and problems, they did not contribute to the group. They always conceded to the higher level students in the groups. As time progressed they did not participate in the group's discussion and this carried over to whole class discourse. They became discouraged and convinced that Algebra would always be difficult for them to learn.

I decided as my action research to place these students into homogeneous groups for the third quarter of the school year. I believed if they were still in the same class but now were in homogeneous groups they would participate in the small group discussions and evolve into *active* learners. Without the smart high level student to dominate the group they would feel freer to express their opinions. With all low level students in the same group they could no longer immediately assume the other students would give them the answers. My main objective of any small group is to encourage Algebraic discussion and to improve their learning and retention of information. My action research question: ***Does a low level performing student show greater improvement when grouped in a cooperative/collaborative group of students with similar levels in Algebra?***

Review of Literature

I searched for articles that studied the benefits of heterogeneous versus homogenous grouping and found virtually nothing. There are many articles describing how to select students to arrange into heterogeneous groups. (1) Many studies concluded that working in collaborative groups is an essential skill students will need before they enter the business world. (2) But I found nothing analyzing the pros and cons of homogeneous grouping. There were studies providing evidence of the ineffectiveness of tracking and class ability grouping for the low level student. In a speech Mary Futrell (3) referred to “As an alternative to tracking and ability grouping, advocates of equity most frequently propose using small, **cooperative learning groups** in heterogeneous classrooms. In diverse cooperative learning groups, students demonstrate individual accountability and responsibility for working with others toward a shared goal.” With the dearth of information, research, or data, I knew I would need to carefully conduct my own research in my own classroom with my students.

Variables

The variables I focused on were the students who earned less than 70% thusly receiving a grade of “D” or “F” for the second quarter in the 2004-2005 school year. There were a total of seventeen students from the four sections of Algebra that I teach to gifted eighth grade students. The groups were located closest to my desk so that I could easily listen to their discussion and so that I could be easily and quickly assessable to them when they needed me. I observed their interaction with each other in the small group and their involvement in whole class discussion. The grouping of students is a normal procedure in my classroom. The students are assigned to new groups each quarter. An outside observer would not have notice any differences among the new groups third quarter.

Research Question

Does a low level performing student show greater improvement when grouped in a cooperative/collaborative group of students with similar levels in Algebra?

Approach

First quarter the students were randomly selected to be in their small groups of four students each. They form these groups every day of class except on testing days. Second quarter all students were assigned to new groups with each group consisting of one high performing students, two average performing students and one low performing student based on their first quarter grades. The conventional thinking is that in a heterogeneous ability group the high performing students would be able to help the low performing students when they needed it. Third quarter the class was once again assigned to new groups. Students who received a low grade both first and second quarters were assigned to the same group. I had only one group of these students in each class period. The rest of the groups were a heterogeneous mix of high and middle performing students.

Negotiations

There were minimal negotiations undertaken as I proceeded. I alerted the students other core teachers in Language Arts, Science, and Social Studies. In a middle school setting the four core teachers work together as a team and teach the same team of about 120 students. They agreed not to vary their seating and grouping assignment to mirror my classroom. They either did random or heterogeneous seating and grouping. Teachers decide how the students are arranged in their own classroom. After the second quarter report card grades my team of teachers had conferences with the students to discuss if they had any suggestions on how to help them do better in class. I explained the grouping in my Algebra class as an opportunity for them to work together and to feel less pressure, but I did not discuss my expectation of the outcome from the new grouping. My principal was told of my action research.

I contacted the students' parents either in a team teacher-parent conference or by phone and inform them of the new grouping. Only one parent request that her child be reassigned to a heterogeneous group. The parent agreed that in a heterogeneous group her child waited for the better students to "just give her the answers" and rarely contributed to the group. She said her child did "felt she was

holding the others back and so just agreed to go along with the others even when she did not understand.” The parent felt her child did not have a good understanding of the Algebra skills but she still wanted her in a heterogeneous group so that the other students would “continue to give her the answers to write down.” The parent was mainly concerned that her child gets at least the passing grade of “D” and was unsure of the end result from a homogeneous grouping.

Timeline

The timeline was one nine-weeks grading period. I used the third quarter that started in January 2005 and ended in early March 2005.

Data Collection

I collected data comparing the students’ performance from the second and the third quarters of:

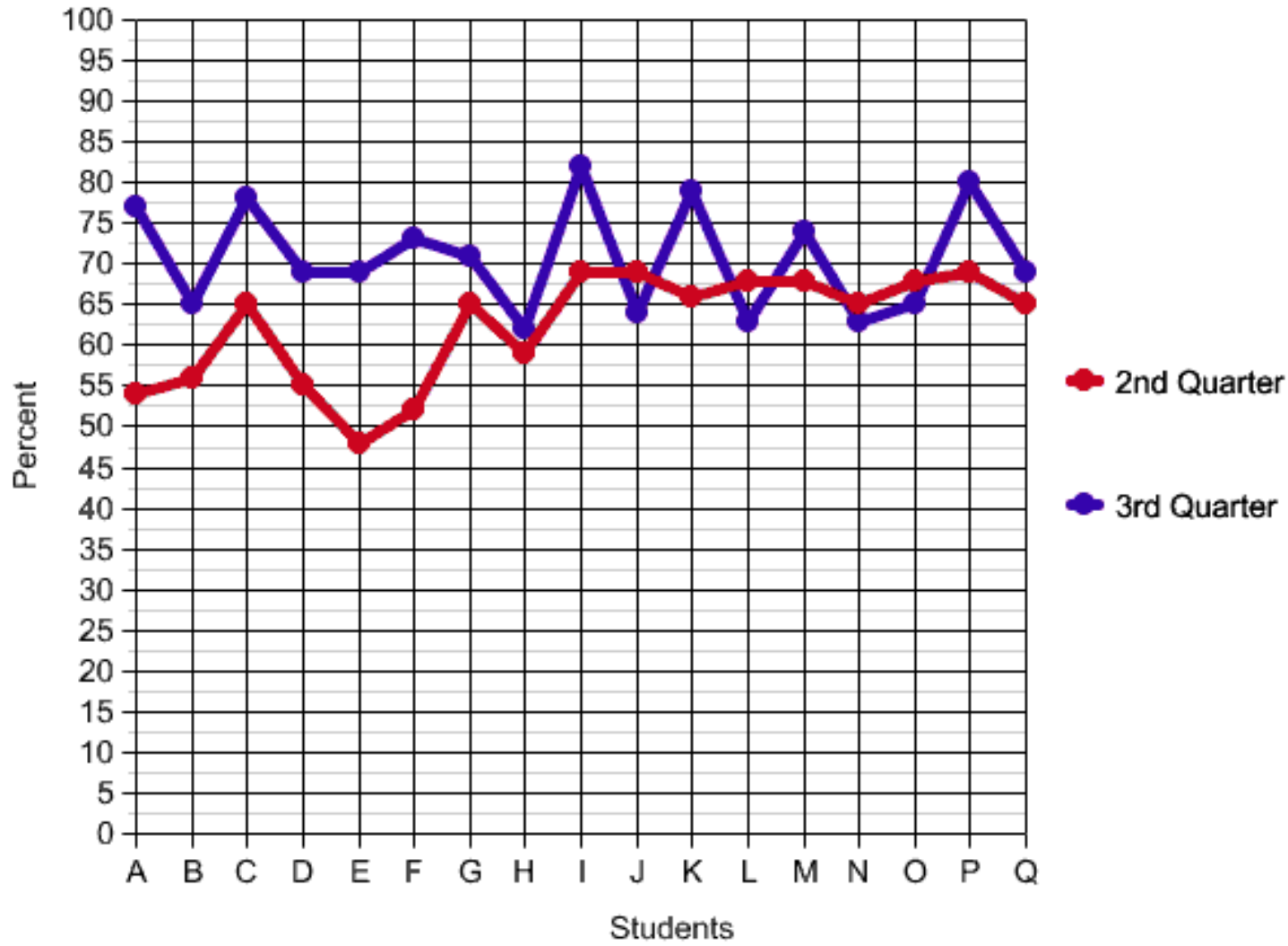
- Report Card GPA
- Tests GPA
- Quizzes GPA
- Rate of Completion of Algebra Assignments
- Participation in Extra Credit
- Participation in Grade Recovery
- Participation in Remediation
- Attendance

Later at the end of the school year and their state competency test results are available, I plan to compare that data also.

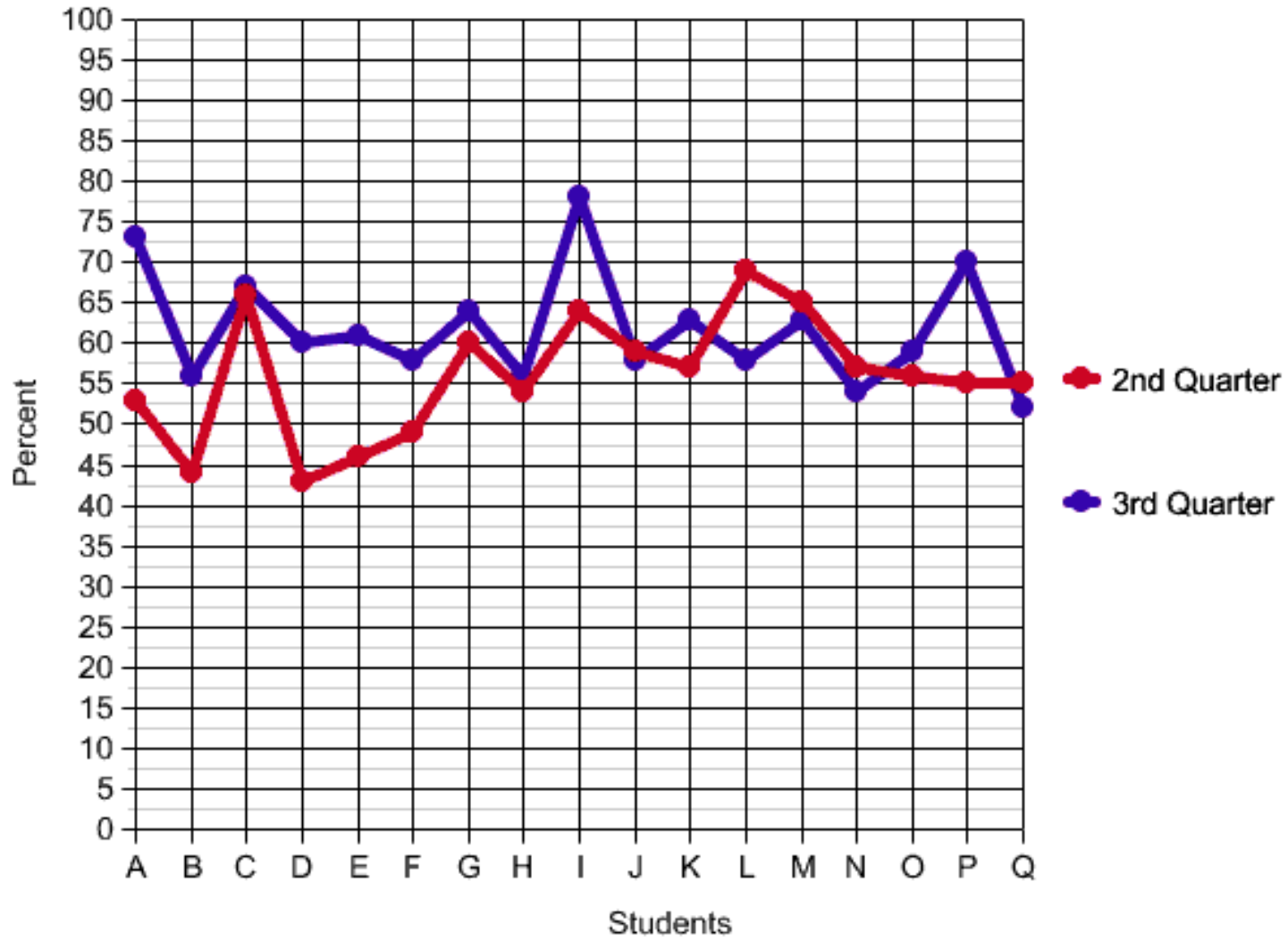
Data Analysis

The data early on started to show improvement in the students. I observed in class that each student was willing to act as presenter when their group was given a problem to present to the entire class. Their completion of assignments improved for all but one student. I had the least change in their weekly quiz grades. The quizzes GPA improved or stayed nearly the same, though for a few there was a drop. I believe they are less prepared for unexpected weekly quizzes than for expected tests and assignments. Their tests GPA improved for twelve of the students and stayed nearly the same for four students staying within a range of 3 points. One student had an 11 point drop in her test GPA. Their report card GPA improved for thirteen students. The other four students dropped five points or less.

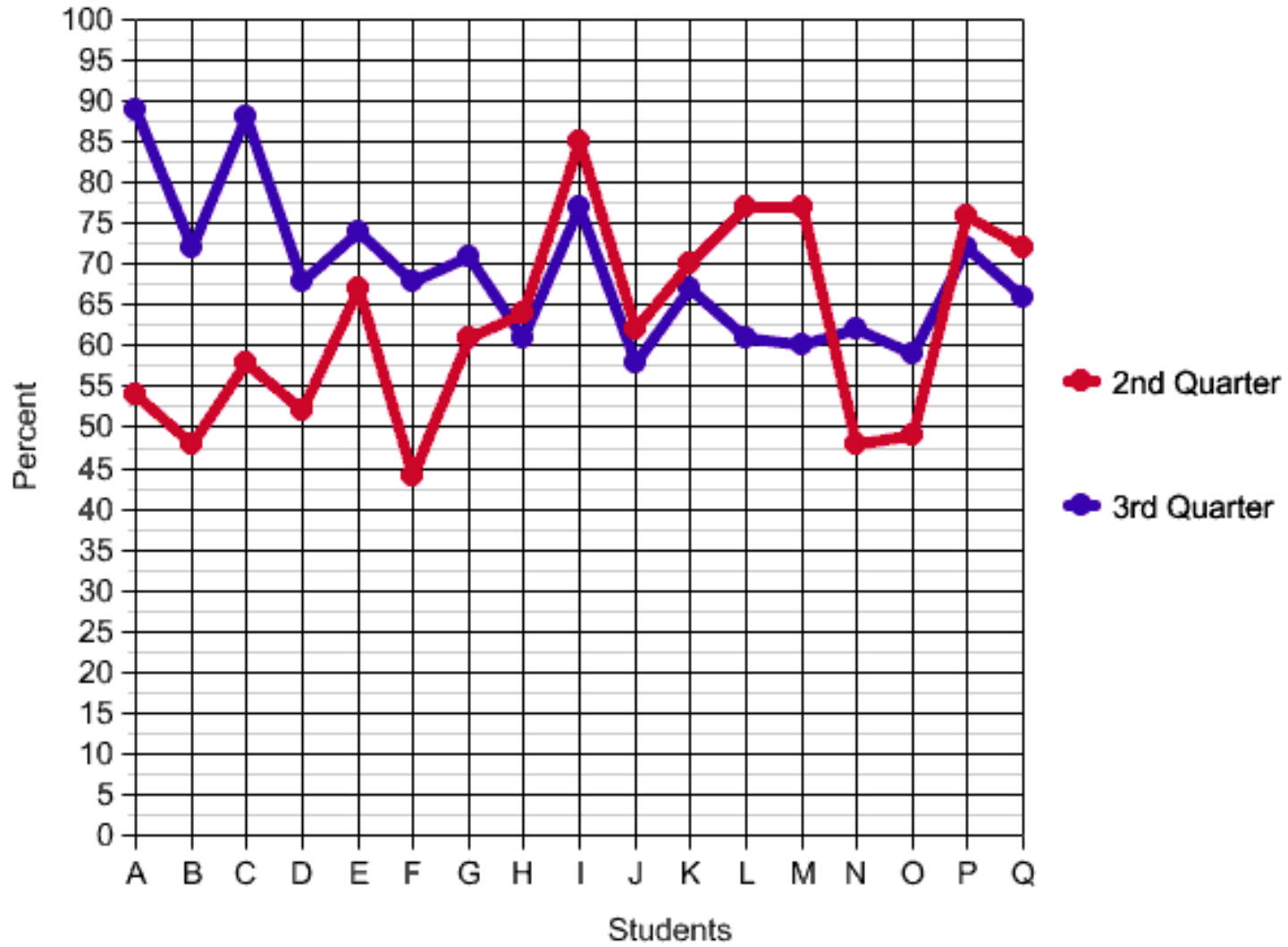
Report Card Grade Point Average GPA



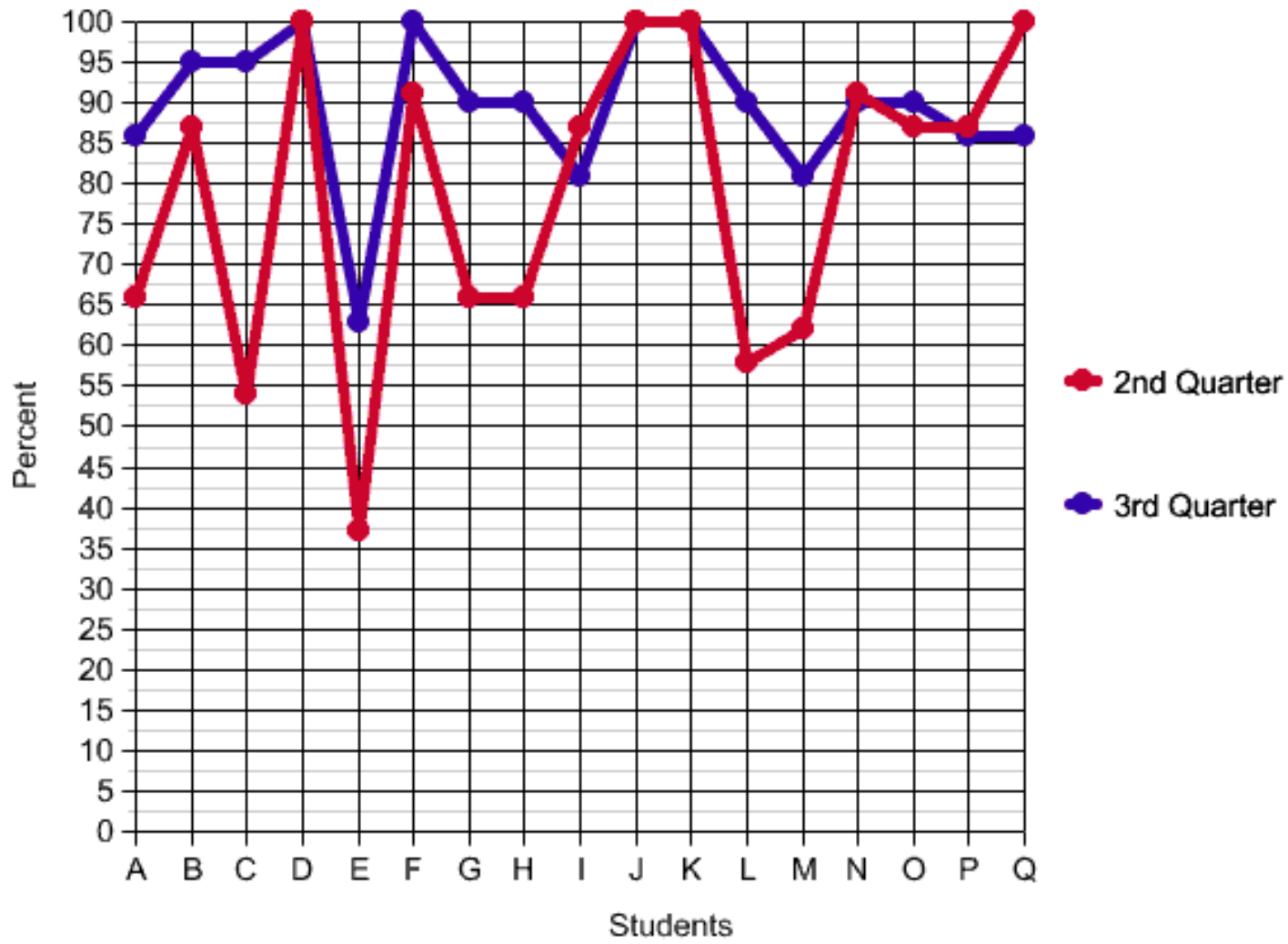
TESTS Grade Point Average GPA



Quizzes Grade Point Average GPA



ASSIGNMENTS COMPLETED



Improvement in attendance was inconclusive due to illnesses and other factors that could not be controlled. Some improved, some were much worse. The three students who had an increase of 10 additional absences were the students that did not improve their report card GPA. My school's policy is that grade recovery and remediation is available only for students who receive a failing grade. All students who qualified for grade recovery and remediation participated.

I expected an improvement but my results were much better than I anticipated. I was pleasantly surprised, the students were happy and the parents were delighted. The best result was the confidence the students developed and their changing from passive to active learners.

Action Plan

The results from my action research were encouraging. I plan to continue it next year. I will implement the homogeneous grouping sooner during the second grading quarter. I will also change the grouping more often. Rather than once every nine-weeks grading period, I will reassign groups in mid-quarter. I plan to keep the heterogeneous grouping for the high and middle performing students. The other teachers on my team who teaches the same students plan on trying the homogeneous grouping next year to determine if they get the same results in the different core subjects.

My Reaction

I learned that grouping for different age levels is important. I always did believe that it is necessary to make adjustments based on the current year's students. I will question more and do more research on conventional practices that do not seem to deliver the promised results. I will not hesitate to make changes and to document the results. I found a user friendly resource in GEM, the Gateway to Educational Material, in looking for data and research articles. Meeting monthly helped me with my timeline of meeting deadlines and to glean ideas from other action research teachers. The website and blog was underused. I would access the site and found nothing was updated from the previous week. I understand that each action research has a different timeline as to when they would conclude their research. I look forward to reading them upon their completion.

Resources

1

The Jigsaw Classroom

<http://www.jigsaw.org/overview.htm>

2

Collaborative Group Projects:
An Essential Element in the Training of Computer Students
Smith, Betty
August 1, 2002

http://www.techlearning.com/db_area/archives/WCE/archives/bsmith.htm

3

Speech: Grouping Practices
Futrell, Mary

<http://www.ncrel.org/sdrs/areas/issues/content/contareas/math/malgroup.htm>

The Gateway to Educational Material GEM

<http://www.ncrel.org/sdrs/areas/issues/content/contareas/math/malgroup.htm>

DATA COLLECTION

Name	Report Card		Assignments			Absences		
	Grade	GPA	Completed	2 nd	3 rd	2 nd	3 rd	
	2 nd	3 rd		2 nd	3 rd		2 nd	3 rd
A	54	77	A	16/24	19/22	A	14	3
B	56	65	B	21/24	21/22	B	1	2
C	65	78	C	13/24	21/22	C	1	1
D	55	69	D	24/24	22/22	D	1	0
E	48	69	E	9/24	14/22	E	7	2
F	52	73	F	22/24	22/22	F	7	2
G	65	71	G	16/24	20/22	G	2	0
H	59	62	H	16/24	20/22	H	3	0
I	69	82	I	21/24	18/22	I	1	4
J	* 69	64	J	24/24	22/22	J	6	17
K	66	79	K	24/24	22/22	K	0	0
L	* 68	63	L	14/24	20/22	L	6	18
M	68	74	M	15/24	18/22	M	0	0
N	* 65	63	N	22/24	20/22	N	7	17
O	* 68	65	O	21/24	20/22	P	1	3
P	69	80	P	21/24	19/22	O	1	3
Q	65	69	Q	24/24	19/22	Q	0	1
	Grade		Assignments			Absences		

DATA COLLECTION

Name	Quiz GPA		Test GPA		Extra Credit		Grade Recovery	Remediation
	2 nd	3 rd	2 nd	3 rd	2 nd	3 rd	3 rd	3 rd
A	54	89	53	73	14	7	Yes x	
B	48	72	44	56	7	8		Yes
C	58	88	66	67	7	8	Yes	
D	52	68	43	60	10	8	Yes	Yes
E	67	74	46	61	0	8	Yes x	
F	44	68	49	58	5	7	Yes	
G	61	71	60	64	14	10		Yes
H	64	61 *	54	56	8	8	Yes	Yes
I	85	77 *	64	78	12	8		
J	62	58 *	59	58 *	15	0		
K	70	67 *	57	63	9	10		
L	77	61 *	69	58 *	5	0		
M	77	60 *	65	63 *	15	8		
N	48	62	57	54 *	15	0		
O	49	59	56	59	17	9		
P	76	72 *	55	70	12	12		
Q	72	66 *	55	52 *	11	10		
	Quiz GPA		Test GPA		Extra Credit		Grade Recovery	Remediation