

**The Impact of Middle School Reform Initiatives on
Student Achievement and Retention
in a Florida Magnet School**

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ABSTRACT. The purpose of this study was to determine the impact of a magnet middle school's reform initiatives on retention, 8th grade writing achievement for the full implementation year, and standardized achievement scores for students who attended Brown Barge Middle School for three consecutive years. Retention rate, writing skills, and standardized test achievement scores in six areas were examined. Results indicated a high retention rate and an increase in writing achievement for students. Standardized test scores indicated a significant increase in reading, science, and social studies achievement. There was a significant decrease in math achievement.

Many magnet schools throughout the country are designed to function as a desegregation effort, are typically located in minority neighborhoods, and are characterized by innovative educational curricula (Bolanos, 1990; Bolick, 1990; Demoze, 1987; New York State Department of Education, 1985; Rossell, 1985; Stover & Trotter, 1991; Tonegawa, 1991; United States Office of Educational Research and Improvement, 1988). Rossell (1985) identified specific characteristics common to most magnet schools and methods that encourage enrollment to aid desegregation. Magnet schools mandated by school districts fare better racially if they first allow parents to choose the school in which their children enroll. In a study of 20 school districts (Rossell, 1985), voluntary transfers produced more long-term interracial exposure than did mandatory reassignments. Nonetheless, schools using mandatory approaches to desegregation have a higher retention rate than schools with no plans. Regardless of the assignment method used, magnet schools located in isolated minority neighborhoods are most successful in retention when elementary magnet schools implement innovative curricula and secondary magnet schools design and deliver rigorous academic instruction. Furthermore, the greater the selectivity of admission criteria (or at least perceived selectivity) for identification of students, the more successful the effort in desegregation.

Brown Barge is a magnet middle school of choice located in Escambia County, Florida. The characteristics of the magnet middle school include a flexible schedule with extended time blocks for instruction, planning, and special events; technology components that are incorporated into the core curriculum; and an integrative and cross grade level approach to designing and implementing curriculum and instruction.

Students eligible to attend Brown Barge are judged on five criteria: grades, test scores, task commitment/motivation, creativity, and special need (family, trauma, single parent, etc.). Students have to meet three of the five criteria with one being standardized test scores or grades. Students must have an overall "B" average or score in at least the 75th percentile on the California Achievement Test (CAT). All students who meet the eligibility criteria enter a pool of applicants. A certain percentage of minorities are first randomly selected to comply with the district's majority/minority ratio. The remaining minority applicants are then pooled with the majority for random selection.

Purpose

The purpose of this study was to determine the impact of a magnet middle school's reform initiatives on student achievement and retention over a three year period. In the first year examined, Brown Barge implemented traditional middle school components; that is, characteristics such as block scheduling, integrated curriculum, and multi-age grouping did not exist. In the 1991-92 and 1992-93 school years Brown Barge received a grant from the Magnet Schools Assistance Program. The intent of the assistance was to provide funding to schools that are part of an approved desegregation plan in the local school district. According to the grant, Brown Barge Middle School had to retain a specified minority/majority ratio of students who enrolled in the program; i.e., it had to reflect the approximate 36% minority composition of the county. In the first year of the grant (representing year 2 in this study), Brown Barge partially implemented a number of middle school reform initiatives, and full implementation occurred in the second year (representing year 3 in this study). To determine the impact of these reform initiatives this investigation examined the dependent variables retention rate, writing skills achievement and standardized test achievement in six areas (reading, language arts, mathematics, reference skills, science, and social studies).

Method

Sample

Three different samples were used to analyze retention, writing achievement, and standardized student achievement. For examination of the retention rate the sample consisted of the sixth, seventh, and eighth grade classes from Brown Barge for the 1992 (N=410) and 1993 (N=511) school years. For the examination of writing and standardized test achievement, only the eighth graders were used since they were the only grade required to take the writing assessment and had attended the magnet school for three consecutive years. Of the 164 eighth graders attending Brown Barge in the full implementation year, the county's Management Information Services (MIS) department was able to provide standardized test scores for all three years on 131 students. Therefore, these students were the sample used to analyze the difference in test scores during the three years.

Procedure

Since Brown Barge was created as a voluntary magnet school for desegregation purposes, the school's and the district's majority/minority enrollments were compared through descriptive data. Student retention was determined by how many students withdrew from Brown Barge in the interim of the partial implementation year of 1992 to the interim of the full implementation year of 1993. Retention data were gathered from the school system's MIS center. In examining retention, student withdrawal due to a family move out of the school district, death, or health were not counted against enrollment. A student withdrawal for transfer to another public school, private school, or other alternative within the school district was counted against enrollment.

Achievement scores of the full implementation year of the middle school reform initiatives were compared to the achievement scores of the two prior years. Year 1 (1991) was defined as the control year since the students were schooled in a traditional middle school environment. In year 2 (1992) Brown Barge was in the development phase and chose to partially implement reform strategies. Year 3 (1993) was the full implementation year in which students participated in integrated instruction, block scheduling, and multi-age grouping.

Pre and post 8th grade writing achievement (N=76) for the 1992 and 1993 school years was analyzed. Writing scores were assessed using the Florida Grade 8 Writing Assessment. The Florida Grade 8 Writing Assessment consisted of pretest and posttest scores from "Writing to Explain" and "Writing to Convince" assignments, including a sample of both explanatory and persuasive writings, respectively. Student responses were scored using a holistic method that concentrated on Focus (how clearly the paper presented and maintained a clear main idea), Organization (structure or plan of development), Support (quality of the details used to explain, clarify, or define), and Conventions (mechanics of punctuation, capitalization, spelling, variation in sentence structure). Scores ranged from 6 (well-planned responses that utilized varying sentence structure with few grammatical and spelling errors) to 1 (unorganized responses that did not demonstrate clear expression, and had many grammatical and spelling errors).

Results

The purpose of this study was to determine the impact of a magnet middle school's reform initiatives on retention, 8th grade writing achievement for the full implementation year, and standardized achievement scores for students who attended Brown Barge Middle School for three consecutive years.

Student Retention

As indicated in Table 1, the current district enrollment status of middle school students in Escambia County was approximately 64% white, 32% black, and 4% other minorities across all three grade levels. The MR column indicates the ratio of all minorities to the total sample; therefore, the overall district minority ratio was 35.6%. Also provided in Table 1 are the enrollment data for

Brown Barge. The majority/minority data were very comparable to the district data; the magnet school had a minority ratio of 34%. Brown Barge's goal from the grant was to maintain the minority ratio at the district average plus or minus 3%.

Table 1

District Student Enrollment by Race and Grade Level

Grade Level	District						MR %
	White		Black		Other		
	N	%	N	%	N	%	
Grade 6	2218	65.5	1023	30.2	143	4.2	34.4
Grade 7	2097	63.5	1061	32.2	142	4.3	36.4
Grade 8	2033	64.1	1024	32.3	115	3.6	36.0
Total	6348	64.4	3108	31.6	400	4.0	35.6

Grade Level	BBMS						MR %
	White		Black		Other		
	N	%	N	%	N	%	
Grade 6	122	66.3	52	28.3	10	5.4	34.0
Grade 7	98	59.0	53	32.0	15	9.0	41.0
Grade 8	111	73.0	38	25.0	3	2.0	27.0
Total	331	66.0	143	28.5	28	5.5	34.0

Note. MR=Minority Ratio, total minority/total.

The enrollment data for spring of 1992 and spring of 1993 for Brown Barge are presented in Table 2. The student population increased by 101 students; the sixth grade increased 37 students, the seventh grade 25 students, and the eighth grade 39 students. Also included are the number of students classified by Florida Department of Education withdrawal code who withdrew. The W0 codes represent the following: W02 indicates a student who has transferred to another school in the same district; W03 indicates a student who has transferred to another school out of district yet remained in the state; W04 indicates a student who transferred to attend a private school; and W24 indicates a student who received homebound education. Only the codes of W02 and W04 were counted against the 1993 enrollment totals. The goal from the grant that Brown Barge had set was to retain 95% of its students during the full implementation year of thematic curricula. Rather than

withdrawal presenting a problem, the school had to increase enrollment totals for 1993. The school at present maintains a sizable waiting list.

Table 2

Brown Barge Student Enrollment for Partial and Full Implementation Year

Grade Level	1992	1993	Withdrawal				% Retain
			W02	W03	W04	W24	
Grade 6	142	179	3	3	1	1	98.0
Grade 7	143	168	1	3	3	1	98.0
Grade 8	125	164	7	7	1	0	95.0
Total	410	511	11	13	5	2	97.0

Note. W02 - transfer in district, W03 - transfer out of district, W04 - transfer to private school, W24 - homebound.

Standardized Student Achievement

Standardized achievement for students over a three year period was examined using Normal Curve Equivalent (NCE) subtest scores from the California Achievement Test (CAT). The subtest scores from the CAT were analyzed using a repeated measures multivariate analysis of variance. For the eighth grade CAT subscores, contrast comparisons were made between the full implementation year and the two previous years; and between the partial implementation year and the traditional year. The full treatment year was weighted equally with the two prior years; that is, the full treatment year was given a weight of 1 and the other two years were weighted .5 for contrast comparisons. Contrast comparisons were then performed between the full implementation year and the partial and traditional years, as well as between the partial and the traditional years.

Results of the multivariate repeated measures analysis indicated a main effect for time ($F=16.10$, $df=12,119$; $p=.0001$). For the first contrast (full implementation versus partial implementation and traditional) there was a significant increase in reading, science, and social studies scores; and a significant decrease in math scores. However, on the second contrast (partial versus traditional), there was also a significant increase in science and social studies scores, as well as a significant increase in math scores.

Overall, NCE's were well above the national average of 50 (Table 3). This high average is to be expected because of the type of admission criteria Brown Barge educators used to select students. Therefore, the intent of this study was to analyze standardized test scores of students who attended Brown Barge for three years, rather than to determine the difference between the scores of students attending Brown Barge and students attending other middle schools in the school district.

Table 3

Means, Multivariate and Univariate Results for Two Planned Comparisons

	df	MS	F	p
1st Planned Comparison (Full vs. Partial and Traditional)				
Multivariate Test	6,125		22.04	.0001
Univariate Tests				
Reading	1,130	708.04	15.29	.0001
Language	1,130	143.63	2.88	.0919
Math	1,130	306.72	5.61	.0193
Reference	1,130	4.28	0.03	.8569
Science	1,130	5691.13	64.92	.0001
Soc. Studies	1,130	3510.08	40.32	.0001
2nd Planned Comparison (Partial vs. Traditional)				
Multivariate Test	6,125		8.94	.0001
Univariate Tests				
Reading	1,130	152.67	2.94	.0886
Language	1,130	10.32	0.21	.6490
Math	1,130	249.19	4.83	.0297
Reference	1,130	88.18	0.79	.3765
Science	1,130	4394.39	46.13	.0001
Soc. Studies	1,130	749.04	9.02	.0032
Means				
Variable	1991	1992	1993	
Reading	74.46	72.93	76.54	
Language	75.11	75.50	74.02	
Math	73.25	75.20	72.35	
Reference	70.05	71.21	70.40	
Science	71.27	79.46	83.44	
Soc. Studies	75.60	78.98	83.63	
Note.	N=131.			

Eighth Grade Writing Achievement

A dependent means *t*-test using the pretest and posttest scores was used to analyze the students' scores from the Florida Grade 8 Writing Assessment. Results of the *t*-test on the writing assessment indicated a significant increase in scores on both the "write to explain" ($t(75)=8.17, p<.01$) and "write to convince" ($t(75)=4.19, p<.01$) tests. The mean increased on the "right to explain" test .54 points ($M_{pre}=3.39, SD=.88$; $M_{post}=3.93, SD=.96$). The mean increased on the "right to convince" test .36 points ($M_{pre}=3.21, SD=.83$; $M_{post}=3.57, SD=.77$). The explanation score means had a greater gain than the convincing score means.

Conclusions

Little research exists on the effectiveness of magnet middle schools, especially their impact on retention and achievement (Rossell, 1985). This study explored these two issues. The results indicate that one voluntary magnet middle school that implemented middle school reform initiatives was able to maintain the majority/minority ratio of the district and still retain students. Rather than retention of students being a problem, the school had to increase admissions for the 1993 year.

This study also indicates that the implementation of middle school reform initiatives, such as integrated curriculum, flexible scheduling, and multi age grouping impact content area standardized student achievement scores differently. Brown Barge students demonstrated an overall positive effect for science and social studies standardized test scores; these scores increased during the partial and full implementation years. Math scores, however, first increased and then decreased. Also, there was a significant difference in eighth grade student writing achievement.

Due to a number of limitations, magnet school effectiveness is difficult to demonstrate. Brown Barge Middle School, already a school for able learners, had higher standardized test scores than the district; thus, it lacks an appropriate control group for comparisons. However, cursory examinations of the test scores from the other nine middle schools indicate that the mean NCE's for the county were close to the national average of 50 (plus or minus 2), and the schools other than Brown Barge did not demonstrate the same gains over time. Formal comparisons of all middle schools in the county were not made due to the lack of a school (or schools) that would serve as an adequate control group. Research, however, can be conducted to assess the long-term impact on students who attend magnet middle schools that implement innovative middle school restructuring initiatives. To further investigate the long term impact on student retention and achievement, Brown Barge plans to follow the achievement of a cohort of sixth, seventh, and eighth graders in their high school years. Furthermore, additional research that accesses magnet school program components more in depth is needed to understand the effectiveness of magnet schools.

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