The Extended School Year: Implications for Student Achievement

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ABSTRACT

Public policy makers have focused some attention upon extending the length of the school year. The current study investigated the following question: How does the number of days of school attended influence the level of student achievement on standardized tests? The achievement scores of students from two different school systems were analyzed. These students had experienced an interrupted school year of approximately 1 month due to severe weather in 1976–77. Yearly comparisons between the achievement scores of 1976–77 and other school years were made within and across groups. The results of the various comparisons suggested that simply increasing the length of the school year would not likely produce marked changes in test score performance.

SEVERAL STATES are considering extending the length of the school year and/or the school day in response to public pressure. The proposals vary from state to state but all share the common theme of addressing noted problems in the current structure of public education. The foremost of these stated deficiencies is a low level of performance on standardized tests. According to proponents of the extended year, one of the benefits derived from its adoption would be increased test scores (Increased Class Time, 1983). The aim of the current study was to investigate the validity of the claim that lengthening the school year would produce corresponding changes in standardized test performance. The specific question considered was, How does the number of days of school attended contribute to the achievement level of students on standardized tests?

The rationale for extending the school year appears to be rooted in a position that emphasizes the amount of time allowed for learning. The most referenced statement that presents the importance of the time dimension in school performance is that of Carroll (1963). In it the level of learning was described as being a function of the time allowed for learning, student perseverance, special aptitudes, general ability to understand instruction, and the quality of instruction. These five factors were further reduced in the model to two temporal dimensions, the amount of time on task and the amount of time needed to learn the task. The validity of this conceptualization of school learning has been supported indirectly through research on mastery learning for which it provides a theoretical base (Bloom, Madaus, & Hastings, 1981).

Some studies have expanded the concept of learning time presented in Carroll's model to the more global concept of available school time for learning. Wiley and Harnischfeger (1974) compared achievement and quantity of class time across a sample of schools. Results indicated that those schools exhibiting the higher mean achievement also had the greater average time spent in class. Similar results were obtained by Richmond (1977), who surveyed administrators of extended school year projects. A majority of the respondents indicated they felt a positive effect on achievement resulted.

In contrast to these findings, other investigations do not support the notion that higher levels of achievement can be expected from increasing the length of the school year. Efforts by Karweit to replicate Wiley and Harnischfeger's study produced less impressive results (Karweit, 1976, 1985). Similar conclusions were reached by Husen (Wiley & Harnischfeger, 1974) and by Price (Young & Berger, 1983). In each of these referenced works, the finding was that extending the school year

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did not result in a proportionate increase in academic achievement.

The area in which the extended school year appears to have the most consistent effect is in the retention of skills among special student populations. Bahling (1980) and McMahon (1983) reported the effects of attending a summer session upon skill retention in handicapped students. The common conclusion was that attendance in an extra school session arrested a regression in skills observed in the summer months for such populations. Overall, it seems that increasing the length of the school year might enhance retention of skills more than improve performance on standardized tests. The study reported here sought to determine the changes in achievement that can be expected from extending the school year. Based on the research evidence reviewed, particularly that of Karweit, it was hypothesized that the number of days of school attended, as defined in the study, would not affect the level of student achievement on standardized tests.

Method

The method employed to investigate the question was ex post facto using test scores obtained in the 1970s. During the 1976–77 school year, students in several western North Carolina counties missed the month of January and a portion of February due to bad weather. All but 5 of these school days were made up eventually, so that the 1976–77 school year was 175 days for some systems. At the time standardized tests were given in the spring of 1977, pupils had attended 10–20 fewer days of school than usual. Since students' attendance was approximately 20 days less that year than in previous years, it was felt that if the length of the school year was the most critical factor, then test scores for that year would be lower than in years when more days of school were attended.

In order to investigate this, the results from standardized tests from two school systems in western North Carolina were analyzed. Both systems had employed the appropriate level of the Iowa Test of Basic Skills for the grades tested. System level grade equivalent scores for school years 1972–79 were available from one school system, while grade level percentile distributions for 1972–77 were obtained from the other. These data were obtained from public records, and the manner in which they were reported (i.e., grade level composites) prevented the generation of within-year measures of score variability or other descriptive statistics. They did contain sufficient information for making year to year within-grade comparisons as well as grade to grade comparisons in two instances. The data comparisons were made visually rather than statistically since Cook and Campbell (1979) indicated that approximately 50 observations were recommended for an adequate statistical analysis of a time series. In the current study, five to seven data points were available. The analyses were performed separately for each school system as the method of reporting summary data differed.

A related issue in the design of the study was whether lack of a comparison group would render any results regarding the length of the school year meaningless. A suitable control group would have been a school system that had used the Iowa Test of Basic Skills for the designated school years but that missed no or few days of school during the 1976–77 academic year. The addition of such an extra group in the study would have provided a means to eliminate "history" as a possible explanation for any differences in test scores from 1976–77 to any other school year. There were no school systems in the western part of the state that had few days of school missed during 1976–77. Using student populations from other parts of the state or from other states would have created the problem of the comparability of the groups.

This lack of availability of an adequate control group resulted in the study being restricted to the two previously identified school systems. This was not seen as an obstacle that would compromise the results. The study compared different groups from year to year; therefore, each separate class served as a partial control for all others tested at that grade level. Likewise, by restricting the analysis to grade level comparisons within a school system, each grade level and school system served as a control over "history" for the other grade levels and school system. The only event of "history" that could not be controlled was of such magnitude that it affected both school systems, and it occurred only during the 1976–77 school year. It was felt that any event of such significance was associated with the bad weather and hence simply magnified the effect of missing the days of school rather than being an unknown confound to the results.

Results and Discussion

The data from the school system reporting grade equivalent scores will be presented first. These are displayed in Table 1. The numbers in the body of the table represent a composite score for all students in the school system at the given grade levels for the respective years. The presence of a year effect can be determined from such data by making year to year within-grade comparisons. Applying this approach to the data in Table 1 indicates that at practically each grade level there were year to year variations with few instances in which the scores remained the same. The score changes involving the 1976–77 school year were no greater than other year to year changes and reflected no uniform trend from one grade level to the next.

TABLE 1—System Level Grade Equivalent Scores by Year and Grade Level

Grade level	School year 72–73	73–74	74–75	75–76	76–77	77–78	78–79
4	4.6	—	4.7	4.5 (311)[a]	4.5 (298)	4.4 (277)	4.5 (316)
5	5.7	5.4	5.2	5.3 (300)	5.4 (313)	5.7 (307)	5.6 (282)
6	6.6	—	6.4	6.0 (331)	6.0 (296)	—	—
7	7.5	7.4	7.1	7.2 (354)	7.0 (329)	7.2 (309)	7.3 (335)
8	8.5	—	8.0	8.1 (325)	8.1 (356)	7.9 (350)	8.2 (317)

NOTE: Students had attended school 136 days in the 1975–76 school year at the time standardized tests were given, 120 days in 1976–77, 127 days in 1977–78, and 132 days in 1978–79. For school years 1972–75, the number of days varied from 130 to 139 at schools within the system because there was no uniform testing schedule.
[a]The number in parentheses represents the number of students on whom the composite score was based.

TABLE 2—Pre- and Post-1976–77 School Year Data by Grade Level Using Median Grade Equivalents

Grade level	School year Pre-76	76–77	Post-76
4	4.6 (3)[a]	4.5	4.45 (2)
5	5.35 (4)	5.4	5.65 (2)
6	6.4 (3)	6.0	—
7	7.25 (4)	7.0	7.25 (2)
8	8.1 (3)	8.1	7.95 (2)

[a]Numbers in parentheses indicate the number of yearly data elements upon which the presented median was based.

TABLE 3—Percentage of Student Population by Grade Level and Year Scoring within Given Percentile Ranges

School year	*N*	Percentile ranges 1–10	11–25	26–50	51–75	76–99
Grade 4						
72–73	716	8.4	10.5	22.9	30.2	27.9
73–74	737	8.9	11.8	24.7	28.8	25.6
74–75	751	8.8	11.9	24.8	28.9	25.4
75–76	614	9.3	11.9	24.8	29.8	24.2
76–77	725	6.8	9.3	24.8	28.2	30.8
Grade 5						
72–73	763	7.4	11.0	24.3	27.2	29.9
73–74	691	8.1	10.4	22.5	29.5	29.5
74–75	746	6.6	11.8	26.8	28.2	26.5
75–76	745	6.5	11.4	25.9	28.4	27.8
76–77	638	6.5	10.0	26.4	31.3	25.7
Grade 6						
72–73	749	8.3	10.6	25.4	28.1	27.8
73–74	766	10.7	11.1	26.4	27.5	24.3
74–75	682	8.8	15.2	22.3	26.8	26.9
75–76	750	7.4	10.1	28.4	29.4	24.7
76–77	746	8.0	11.5	27.6	29.1	23.8

NOTE: Students had attended school 155 days in the 1972–73 school year at the time standardized tests were given, 158 days in 1973–74, 153 days in 1974–75, 155 days in 1975–76, and 143 days in 1976–77.

In order to reduce the "noise" attributed to yearly variations, the grade equivalent scores were examined in another format. This was accomplished by summarizing the pre- and post-1976–77 data using median grade equivalents. This approach simulated pre-treatment assessment, intervention, and post-treatment follow-up (where length of the school year represented treatment). The results are presented in Table 2. As in the first analysis, there was no uniform pre- to post-pattern at the different grade levels. Only at grade 7 was the trend consistent with what would have been anticipated from a school year effect. At grades 4, 5, and 8, the assumed school year effect was another data point in an overall upward or downward trend in the scores.

The proponents of the longer school year could argue, justifiably, that a loss of 15 days should have produced about .1 change in a system level grade equivalent score. Such a small change could be expected to get "lost in the wash" and not show up in year to year comparisons. The data from the second school system provided a means for addressing this issue. These scores were in the form of grade level percentile distributions. As such, any changes in achievement caused by the loss of school days would be detected more easily than with system level grade equivalents. A school year effect would result in larger percentages of students scoring within the lower percentile ranges.

The percentages of students, at specified grade levels, scoring within given percentile ranges are presented in Table 3. Data from grades 4–6 were used because there was incomplete information at the other grade levels. The score distributions at each grade level showed yearly variations. Those associated with the 1976–77 school year were no greater than expected based on the scores from the other years, and only at grade 6 was the direction of the change suggestive of a school year effect when compared with the previous year.

In recognition of the fact that the analyses presented so far have involved comparing different groups, and, as such, group differences could be misinterpreted as year effects, the data from two student cohorts were examined. Student Cohort A was in grade 6 during the shortened school year and Cohort B in grade 5. By looking at the available data for these two groups only, it was possible to investigate a length of school year effect without comparing different sets of students. These data are presented in Table 4. The logic of the comparisons in this case was the same as that used with the data in Table 3. If attending school 10–12 days less in

TABLE 4—Percentage of Students Scoring within Given Percentile Ranges by School Year for Two Cohorts

School year	Grade level	Days in school[a]	Percentile range 1-10	11-25	26-50	51-75	76-99
Cohort A							
74-75	4	153	8.8	11.9	24.8	28.9	25.4
75-76	5	155	6.5	11.4	25.9	28.4	27.8
76-77	6	143	8.0	11.5	27.6	29.1	23.8
Cohort B							
75-76	4	155	9.3	11.9	24.8	29.8	24.2
76-77	5	143	6.5	10.0	26.4	31.3	25.7

[a]Number of school days at the time standardized tests were given.

1976-77 had an impact on test scores, then there would be a reduction in the percentages of the two cohorts at the upper percentile ranges. There was no uniform trend present with Cohort A; with Cohort B, the trend was in the opposite direction from what would have been hypothesized from a length of school year effect.

The limitation associated with this last analysis was that the basis for determining the percentile ranges changed for these student groups. The norms at the three grade levels were established using different samples. This shortcoming was not felt to limit the results in any way since the percentile norms on the ITBS from one grade level to the next can be assumed to be based on similar student populations. Therefore, the standards against which the percentile scores were determined were roughly comparable. Further evidence that the problem was a minor one, if it existed at all, was supplied by the congruence of these findings with those associated with Table 3. In the data in Table 3, there were no across norm group comparisons.

In summarizing the analyses presented, there were no uniform trends from year to year within grade levels or within groups. This would lead one to accept the hypothesis that increasing the length of the school year would have no influence on standardized test scores. However, given the ex post facto nature of this study, other explanations to this conclusion must be considered. Three alternatives for why the longer time school was attended produced no differences seemed most probable. These were attendance patterns, independent work on studies outside school, and increased levels of student motivation.

The current study simulated a reduced school year using school time lost during the month of January for a single school year. It is possible that in a regular year, absences from school during January are normally much higher. This may be to such an extent that school being closed for that period of time would not radically alter the overall total days attended. This possibility was investigated by looking at the attendance rates for the 1983-84 school year for one of the school systems used in the study. For that year no days were missed during January due to inclement weather. If attendance during that school month was radically lower than the other months, then a differential attendance rate would be a likely explanation for why there were no well-defined patterns of test score differences associated with the 1976-77 school year. The observed attendance rate in the month of January for the 1983-84 school year was 93.7%. This compared to an overall average attendance rate (less the month of January) of 95.4%. Therefore, attendance during the month of January was 98% of what would be considered to be average attendance for the other school months. Generalizing this to other school years, it was felt that the slight difference in school attendance patterns for the month of January did not offer a valid alternative for why performance on standardized tests in 1976-77 was not systematically different than in the comparison years.

The other two alternatives were independent work outside school and increased motivation by students. If students had performed a large amount of school work at home while school was not in session, then the missed days and studies would have had a minimal impact on test scores. Likewise, if students were more motivated to study when school resumed, then the greater involvement and intensity in academics could have eliminated the possibility of any expected deficits due to school time missed. These two potential explanations were tested by surveying some of the teachers of one of the school systems used in the study. A brief questionnaire was distributed at each of the elementary schools in the system. It requested those teachers who were teaching in grades 4, 5, or 6 in that school system for the 1976-77 school year to respond. Of the approximately 70 teachers employed in the designated grades for the 1976-77 school year, 25 were still employed in the system and returned the questionnaire.

The responses to two questions on the survey form were most pertinent to this portion of the study. Ninety-one percent of the teachers felt that there was little evidence to indicate that students had done a significant quantity of school work at home. Assuming their recall was reasonably accurate, the lack of a difference in the test scores between 1976-77 and other school years could not be attributed to students doing work outside school. The response pattern was almost opposite on the question regarding student motivation. Seventy-six percent of the teachers indicated that a higher level of motivation existed after school resumed than was normally present. This suggested that greater student interest may have been at least a partial explanation for why test scores were not different in the target year. There could have been just as much active learning time for students in the shortened year as during a year in which time was not lost.

Based on the similarity in the results across the different types of analyses, the hypothesis that test scores

would not be affected by length of the school year was accepted. This should not be construed as saying that the amount of learning time is unimportant, but that a simple extension of the school year may not increase learning time. The data that have been presented were not perfect for answering the question at hand, but they provided a good proxy. It can be argued that the impact of the loss of school days in 1976–77 should have been greater than just a simple reduction of the school year for an equivalent period. The manner in which the days were lost represented the disruption of 1½ months of school. The loss of days plus the added effect of the disruptive manner in which it occurred should have produced a larger difference than just missing school days.

The most viable reason for the minimized effect of these lost school days seems to be that when the school year did stabilize, there was a more concentrated effort to maximize the benefits of the school time available on the part of the students. Such an emphasis would have increased the proportion of learning time per unit of school time. At the time standardized tests were given in 1976–77, there was a difference in the number of school days attended when compared with other school years, but there may have been little if any difference in the actual amount of learning time. Individuals anticipating large changes in standardized achievement test scores solely as a result of increasing the length of the school year are likely to be disappointed. Further, if the implementation of a longer school year significantly impacted students' motivation to learn, then test scores could be expected to change accordingly. An alternative to extending the school year might be to concentrate on making more effective use of the currently available school time. This would increase the learning time to school time ratio and could be expected to produce higher student scores. An emphasis on this learning time to school time proportion has the added advantage of not being politically volatile as is extending the school year.

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