

How Time is Spent in Elementary Classrooms

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INTRODUCTION

The Beginning Teacher Evaluation Study provides us with valuable information on how time is spent in elementary classrooms. Some of the major topics are: the average minutes per day which students spend engaged in reading and math activities, student engagement rates in different settings (that is, teacher-led settings versus seatwork) and suggestions on how student engagement rates might be raised. At the same time, BTES and similar studies also help us understand the limitations of increasing engaged minutes in classrooms.

Caution! The results should be read with caution to avoid misinterpretation. The Beginning Teacher Evaluation Study was limited to the investigation of instruction in reading, language arts, and mathematics in second and fifth grades. The students were within the average range - from the 25th to the 65th percentile on the pretests - brighter and very slow students were not included in this study. Although the focus in this study is on basic skills, one should not conclude that the entire day should be devoted to instruction in these skills. Although the focus is on academic engaged minutes, we do not know, as yet, how many minutes are necessary for adequate progress by average, below average, or above average students. These data are intended to describe current practice; they are not intended to prescribe teaching methods.

The first suggestion that follows from these results is that teachers and administrators gather data on academic engaged minutes in their classrooms and compare their results with those obtained in the BTES study. If they wish to increase engaged minutes, they might use some of the suggestions in this paper. We are not sure, at this time, what methods will be most successful with different teachers and students, and much can be gained by the comparing results from different classrooms.

The following is a summary of the major BTES findings on student engagement:

1. The number of academically engaged minutes is moderately high. The number of minutes students spend actively engaged in academic activities is not as high as one might ardently wish nor as low as some feared. Typically, second-grade students spend 1 hour and 30 minutes and fifth-grade students spend 1 hour and 55 minutes engaged in relevant academic activities in language arts and math each day (or about 40 percent

of the in-class time). The most efficient teachers (referred to as the “high teachers” in this report) raise this to 1 hour and 55 minutes in the second grade and 2 hours and 30 minutes in the fifth grade (or about 50 percent of the in-class time). Thus, as compared with the average, students of the high teachers are academically engaged about 25 minutes more per day in the second grade and about 35 minutes more in the fifth grade. If the high teachers are compared with the low, daily differences of an hour in engaged time appear.

It is possible to interpret the differences between the high and average teachers at least two ways. On one hand, in engaged minutes, the difference between the average and the best practice is no larger than 25 to 35 minutes per day. On the other hand, 25 minutes per day spread over 180 days equals 75 hours a year, and 35 minutes a day comes to 105 hours!

At present, it is impossible to say whether the average or high engaged minutes per day are adequate, particularly for low-achieving children. What is impressive is that this is the first time such extensive data on engaged time have been available, and these data can serve as a baseline for subsequent studies in different schools and with different types of students.

2. More allocated time does not lead to less engagement. Many educators worry that if more time is allocated to an activity, students will tire and the overall engagement rate will decrease. The results do not support this fear. In reading, there was a positive correlation between allocated time and engagement rate; in math the correlations were about zero (In each grade, the three teachers who were highest in total engaged minutes were also above average in both allocated time and engagement rate).

3. Seatwork and students working alone is a dominant pattern. Overall, students spend about 66 percent of their time doing seatwork during reading, and 75 percent of their time during math. Overall, students’ engagement rate was 84 percent in teacher-led groups, and about 70 percent when doing seatwork. However, when a great deal of the allocated time is allotted to seatwork (e.g., 90 percent), then engagement during seatwork drops, especially in mathematics. There was no evidence that the seatwork activities were trivial; indeed, the error rate during seatwork was only slightly lower than the error rate during teacher-led activities. At this time, the data have not been analyzed to determine the optimal distribution of seatwork and group work.

4. Some non-engaged activities seem inevitable. Most teachers were fairly similar in the amount of time spent on non-instructional activities such as transitions before and after breaks, housekeeping tasks, and waiting between activities. These activities took about 45 minutes per day.

Even during time allocated for reading and math, interim activities (turning in and passing out papers, getting books, and waiting for help) occupied about 8 or 9 minutes in all classrooms. All these activities may be necessary because of large classrooms and varied students.

The teachers with the highest engaged minutes were able to reduce student off-task time (daydreaming, socializing) from the average of 8 minutes per hour to 4 minutes per hour, but they were similar to the average teachers in all the above non-instructional and non-engaged activities.

5. Substantive interaction is related to higher engagement. Substantive interaction (i.e., questions, answers, feedback, and explanations) during group work was correlated both with higher overall engagement and higher engagement during seatwork, suggesting that the practice and corrections during groupwork led to more engagement during seatwork. Substantive interaction during seatwork was also related to increased

Table 1
Time Allocation in Grades 2 and 5

Category	Grade 2		Grade 5	
	Time	Percent	Time	Percent
Academic Activities	2'15"	57	2'50"	60
Nonacademic	55"	24	1'05"	23
Non-instructional	44"	19	45"	17

engagement during seatwork. It was not clear, however, whether this substantive interaction came from a teacher making rounds or from aides in the classroom.

6. "Break time" is negatively correlated with student engagement. Break time referred to all time spent in breaks - recess, lunch, and in-class breaks such as unscheduled physical education and leaving class to go to the bathroom. This time was negatively related to engagement. It was suggested in the BTES report that relatively long periods of "play" carry over and disrupt engagement during academic "work."

7. It may be difficult to find more time for academic instruction. These data give the impression that academic time is more constrained than we thought. If teachers wish to find more time for the academic instruction of low-achieving students, where is it to come from? The non-instructional time and the interim and wait time during instruction appear to be fairly constant - necessitated by the difficulty of dealing with diverse children and diverse activities. Many educators are reluctant to reduce the nonacademic time in music and art. One alternative may be increasing the school day, another may be diminishing the nonacademic activities for the less academically successful students. Although at present there is no evidence of "diminishing returns" from increasing allocated time and diminishing breaks (indeed, quite the opposite), the BTES study did not examine the limits of increasing allocated time for different types of students.

HOW TIME IS ALLOCATED IN ELEMENTARY CLASSROOMS

Let us begin with an overview of how time is allocated in elementary classrooms. Based on their observations, the BTES staff divided the daily classroom activities into three major parts:

- Academic activities (reading, mathematics, science, and social studies);
- "Nonacademic" activities (music, art, storytime, sharing);
- Non-instructional activities (transitions, waiting between activities, class business).

The amount and percentage of time allocated in each major category are presented in Table 1. The percentages of time in each grade are quite similar. Academic and "nonacademic" activities occupy the major portion of the day. The surprising figure - but surprising only for those who are not elementary school teachers-is the large amount of non-instructional time. This non-instructional time, which did not vary much from

* The average time allocated to each category varies a bit in the two grades because of the larger number of "split classes" in the sample of second grade classrooms. In the typical split classrooms, one group of students (e.g., second grade students) attends school from 9:00 a.m. to 2:00 p.m. while the second group attends from 10:00 a.m. to 3:00 p.m. This splitting does not appear to do any harm; a number of the highest classes in achievement gain were split classrooms. However, this splitting is somewhat atypical. The reader may wish to focus more on the descriptive statistics for the fifth grade, which represents the more typical situation - one where most students attend school between 9:00 a.m. and 3:00 p.m. or the equivalent. (A single table summarizing all these data is presented in the Appendix to this chapter, together with the definition of each category.)

Table 2

Time Allocation in Academic Activities

Category	Grade 2		Grade 5	
	Time	Percent	Time	Percent
Reading and Language Arts	1'30"	38	1'50"	39
Mathematics	35"	16	45"	16
Other academic	8"	3	17"	6

teacher to teacher, appears to represent a constant in classrooms as they are currently constituted.

ACADEMIC ACTIVITIES

In each grade, the largest amount of time is allocated to academic activities. A typical second-grade student spends 2 hours and 15 minutes of allocated time per day in academic activities, and a fifth-grade student spends 2 hours and 50 minutes. (See Table 2).

The largest activity is reading. A second-grade student spends about 1 hour daily in reading, and a fifth grade student spends 20 minutes more (1 hour and 50 minutes). Students spend less than half as much time in math as they do in reading and writing: 35 minutes in second grade and 45 minutes in fifth grade. Math activities that occur during science and social studies are included in this figure. Other academic activities, namely, discussion and manipulation in social studies and science, occur for 8 minutes a day in second grade and 17 minutes a day in the fifth grade. (Note that when reading or math occurred during social studies or science, the activity was coded as reading or math, not as other academic.)

"NONACADEMIC" ACTIVITIES

Almost 25 percent of the in-class time is devoted to "nonacademic" subjects such as music, art, and physical education. These activities occupy an average of 55 minutes per day for second-grade students and 65 minutes for fifth-grade students (breakdowns into separate categories were not available).

NONINSTRUCTIONAL ACTIVITIES

Almost 20 percent of the in-class time is spent in non instructional activities (waiting after finishing an assignment, nonacademic class business, and transitions between activities, including going to and from lunch and recess). These activities take about 45 minutes per day. Relatively little time is spent waiting between major activities (4 minutes per day) or in nonacademic class business (6 minutes). The majority of this noninstructio n al time (35 minutes) is spent in transitions.

DISCUSSION

At present we do not know what amount of time is necessary for most students, particularly less academically successful students. This experimental question is a high priority for future study. But if educators wish to increase the amount of time all students or specific students spend engaged in reading, math, music, art, or science, where is this time to come from? One could take time from one activity and give it to another, but these interest groups already claim "their" time is insufficient. Another alternative - diminishing noninstructional time - appears to be difficult to implement because conducting a variety of activities with students who differ from each other in many ways takes a lot of instructional time. One alternative would be to help average teachers increase their allocated time and engaged time to that of the highest teachers in this sample. Yet we do not know if even that much time will be sufficient for the lower

achieving students. Another alternative, particularly for meeting the needs of the lowest achieving students, would be to increase the length of the school day.

ACADEMIC ENGAGED MINUTES PER DAY

The major interest, however, is not allocated time but the minutes a student spends directly engaged in reading, math, and language arts. The BTES researchers called this time “engaged minutes” or “academic engaged minutes.” There were two major findings in the BTES study:

1. The average daily academic engaged minutes is about 1 hour 30 minutes in second grade, and 1 hour 55 minutes in the fifth grade. In each case this is about 40 percent of the in-class time. The higher teachers were about 30 minutes above this figure; the low teachers were about 30 minutes below.
2. The high teachers in each grade not only allocated more time, but their classes also had a higher engagement rate than average teachers. Thus, within the limits of this study, allocating more time in academics did not lead to diminishing returns.

In coding academic engaged minutes, the BTES observers watched six students in each class throughout the day and coded a student as engaged in reading, math, or language arts when he or she was directly engaged in these activities. Engaged students might be attending to a teacher in a group, reading a book alone, writing a composition, or doing seatwork in reading or math. As we shall see in the next section, there were three types of nonengaged activities: interim activities (sharpening pencils, turning in and passing out papers, getting books); waiting for help from a teacher or waiting for a paper to be graded; and off-task activities (socializing, daydreaming, misbehaving). Thus, when students were putting their names on worksheets, or were waiting quietly for papers to be graded, they were not coded as engaged.

Table 3 presents information on the average allocated time, engaged minutes, and engagement rate for the three teachers in each grade who obtained the highest total engaged minutes, for all the teachers, and for the three “lowest” teachers. (There were some teachers who had slightly higher engaged minutes in reading alone or mathematics alone, but the high teachers in this table were for reading and mathematics combined.)

We do not know how representative these teachers are of all teachers. It is tempting to assume that the high teachers in these samples represent the best in current practice, but there may be other teachers who are even more effective in obtaining engaged minutes. Since this question cannot be answered until additional studies are conducted, we will assume that the high teachers in these samples are in the upper 10 percent of current practice, recognizing, of course, this assumption may be changed as future results are accumulated.

ENGAGED MINUTES IN SECOND GRADE

As Table 3 indicates, the average students in the second grade were engaged in reading activities for an average of 1 hour and 04 minutes per day and engaged in math for 26 minutes, for a total of 1 hour and 30 minutes of academic engaged time per day. The students in the classrooms of the three highest teachers were engaged about 20 minutes more in reading, about 4 minutes more in math, and about 25 minutes more overall. The high teachers obtained this extra 25 minutes in two ways: their allocated time was higher, and their engagement rate was higher (81 percent compared with 72 percent for average teachers).

The difference in engaged minutes between the average and the high teachers is 25 minutes per day. If this is spread out over 180 days, it comes to 75 hours! It would seem important to conduct experimental studies to help average and low teachers raise their engaged minutes and to determine the effect of this rise on student achievement. But the

Table 3
Daily engaged minutes in reading and math

	Reading		Mathematics			Total		
	Allocated	Engagement rate	Engaged minutes	Allocated	Engagement rate		Engaged Minutes	Allocated Time
High 3	1'45"	81%	1'25"	35"	82%	30"	2'20"	1'55"
Average	1'30"	73%	1'04"	36"	71%	26"	2'06"	1'30"
Low 3	1'00"	72%	43"	30"	75%	22"	1'30"	1'05"
				<i>Second grade</i>				
High 3	2'10"	80%	1'45"	53"	86%	45"	3'03"	2'30"
Average	1'50"	74%	1'20"	44"	74%	35"	2'25"	1'55"
Low 3	1'25"	63%	1'05"	38"	63%	22"	2'03"	1'25"
				<i>Fifth grade</i>				

Table 4
Daily engaged minutes in reading and math

	Grade 2		Grade 5			
	Total Engaged minutes	Engagement rate	Percent of in-class time	Total engaged minutes	Engagement rate	Percent of in-class time
High 3	1'55"	82%	50%	2'30"	82%	53%
Average	1'30"	71%	39%	1'55"	79%	40%
Low 3	1'05"	72%	28%	1'20"	69%	28%

figure of 1 hour and 55 minutes of engaged time per day may be the upper bound for the most efficient teachers in current constructed second grade classrooms. At the same time, it does not appear that students in second grade are being overburdened by large amounts of engaged time in reading and math.

ENGAGED MINUTES IN FIFTH GRADE

The pattern in fifth grade is similar to second grade except that all times are larger because of the longer school day. There were no split classes in the fifth grade as there were in second grade, and there were fewer breaks.

As is shown in Table 3, the average students in the fifth grade were engaged in reading activities for 1 hour and 20 minutes per day and engaged in math for 35 minutes, for a total of 1 hour and 55 minutes of academic engaged time per day. The students in the classroom of the three highest teachers were engaged about 25 minutes more in reading and 10 minutes more in math, for a total of 2 hours and 30 minutes of academic engaged time per day. As in the second grade, the high teachers achieved this extra 35 minutes of engaged time in two ways: their allocated time was higher and their engagement rate was higher (83 percent to 74 percent).

Again, this figure of 2 hours and 30 minutes per day for the high teachers (or about 53 percent of the in-class time) may represent the current upward limit for engaged time in reading and mathematics activities. If the 35-minute difference between the high and average teachers is multiplied by 180 days, it comes to 105 hours. Again, we do not know how much engaged time is sufficient for different children, particularly for low achieving children.

SUMMARY OF ACADEMIC ENGAGED MINUTES

Because it is difficult to remember all the numbers in the preceding sections, a simplified summary is presented in Table 4.

A major problem in interpreting these results is that we do not know how much time below average, average, or above average students need to make reasonable progress in reading and math. It may be that for low achieving children 2 hours per day of engaged time is not adequate. Nor do we know whether we can use the actual engaged time more efficiently. These areas are high priority for future research.

One interpretation of the data in this section is that the average amount of academic engaged time per day is not particularly high. A fully engaged student could complete his daily reading and mathematics in 1-1.5 hours in second grade and 2 hours in fifth grade. Or, it could be said that students attend to reading and math activities for about 40 percent of a school day.

The three teachers with the highest number of engaged minutes are 25 minutes above the average in second grade and 35 minutes above the average in fifth grade. If these daily differences are aggregated across a school year, the differences are quite high; but we need experimental studies to determine the effect of helping average and low teachers raise their engaged minutes per day. At the same time, these highest teachers may be giving us the natural boundaries of the best of current practice. Additional studies could determine whether these teachers across the country are equaling or exceeding these levels.

DOES MORE ALLOCATED TIME LEAD TO LESS ENGAGEMENT?

As we see in the tables above, the engagement rates of the three high teachers - in both grades and in both subjects were higher than the engagement rates of the other teachers. Across the entire sample, the correlations between allocated time and engagement rate were about .23 for reading and about -.10 for math. Further, students of the high teachers spent less time in clearly off-task behaviors such as daydreaming or socializing. Thus, 2 hours of engaged time in the second grade and 2 hours and 30 minutes in the fifth grade did not lead to bored and restless students.

WHAT WERE STUDENTS DOING WHEN THEY WERE NOT ENGAGED?

During the allocated time for reading and math, what were students doing when they were not engaged? The BTES study coded three types of nonengaged activities during allocated time: interim activities (sharpening pencils, turning in and passing out papers, getting books); waiting for help from a teacher or waiting for a paper to be graded; and off-task activities (socializing, daydreaming, misbehaving). Table 5 gives information on how students spent their nonengaged time. For convenience, these are presented as minutes per hour.

Looking at the average, students were not engaged 16 to 17 minutes each hour allocated to academic activities; conversely, they were gainfully engaged 44 minutes of each hour (or 71 to 73 percent of the time).

Interim and Wait Activities. Looking at Table 5, we see that for almost all teachers, 7 to 9 minutes per hour of nonengaged time spent on interim activities and waiting appears to be a fact of current classroom life that applies to even the most efficient of classrooms. The correlations between wait time and engaged minutes or interim time and engaged minutes were quite low, averaging only $-.10$. In most second- and fifth-grade classrooms, it takes time to pass out and collect books and papers, and students have to wait for help, corrections, and instructions. Under the most efficient conditions these activities take 7 minutes per hour; under the least efficient conditions, they take 10 minutes an hour. There is little variation across classrooms.

The major difference among teachers is in the amount of student off-task behavior. In average classrooms, this occupies about 8 minutes each hour. The most efficient teachers reduce this by half, to about 4 minutes.

Conclusion. Nonengaged time seems inevitable. In average classrooms, students are not engaged about 16 minutes per hour of allocated time in reading and math; the three high teachers reduce this amount to 12 minutes per hour. In classrooms of both average and high teachers, students spend 8 to 9 minutes in interim and wait time. Thus, the difference between the teachers who had the highest academic engaged minutes and the average teacher was about 4 minutes of nonengaged minutes per hour, and most of this difference occurred because the high teachers reduced off-task time to about 4 minutes per hour. (Remember, however, that the high teachers also had more allocated time.)

TIME WITH THE TEACHER AND TIME IN SEATWORK

What major activities occur during the allocated time? The BTES study gathered data on the amount of time a student spent in a teacher-led (or adult-led) group and the amount of time a student spent in seatwork (Table 6). Overall, students spent about 30

Table 5

Nonengaged time during reading and math in minutes per hour

	Reading			Mathematics		
	Interim and Wait Time	Off-Task	Total (%)	Interim and Wait Time	Off-Task	Total (%)
<i>Second grade</i>						
High 3	9"	3"	12" (20)	7"	4"	11" (18)
Average	9"	7"	16" (27)	9"	8"	17" (29)
Low 3	8"	9"	17" (28)	7"	8"	15" (25)
<i>Fifth grade</i>						
High 3	7"	5"	12" (20)	3"	5"	8" (45)
Average	8"	8"	16" (26)	7"	8"	15" (25)
Low 3	9"	13"	22" (37)	8"	14"	22" (37)

Table 6

Time Spent in Teacher-Led Settings and in Seatwork

Grade and Subject		Percent of time in setting	Engagement rate
2 reading	Teacher-led	36	84%
	Seatwork	63	68%
2 mathematics	Teacher-led	27	82%
	Seatwork	73	67%
5 reading	Teacher-led	31	84%
	Seatwork	70	70%
5 mathematics	Teacher-led	24	85%
	Seatwork	76	72%

percent of their time in a teacher-led setting and 70 percent of their time doing seatwork. This heavy amount of time in seatwork occurs because teachers frequently divide a class into three or more groups, and if there are three groups in a class, a student can only spend one-third of the allocated time in a teacher-led setting.

As is shown in Table 6, when students were in teacher-led groups their engagement rate was about 84 percent, whereas during seatwork it was about 70 percent. Although engagement during seatwork was slightly higher in the fifth grade than in second grade suggesting that older students are slightly better able to work alone - discrepancy between engagement during teacher-led activities and during seatwork is still large. Thus, although students spend most of their time in seatwork, their engagement rate is lowest in that setting.

These figures illustrate the difficulty teachers have in working with students of different achievement levels. Students' engagement rates are about 15 percent higher when they are in groups supervised by the teacher, but if the teacher only worked with the class as a whole, the lower achieving students would be behind and the higher achieving students might be bored.

Other studies (Stallings & Kaskowitz, 1974; Stallings et al., 1979; Soar, 1973) have also found that students are more engaged when they are instructed or supervised by a teacher than when they are working alone. Further, the Stallings and the Soar studies have found that teacher time spent working with groups of students is positively and consistently related to achievement gain, whereas teacher time spent working with one or two students is consistently negatively related to student gain in achievement. These negative results probably occur because, when a teacher is working with only one or two students, the remaining students have to work independently. As we have seen, independent work has lower engagement rate.

Currently, the need for students to spend 60 to 75 percent of their time working alone is a fact of classroom life. Whether this percentage can be reduced, or whether instruction can be organized so students are more engaged when working alone, are major areas for future research.

ARE SEATWORK ACTIVITIES TRIVIAL?

The term "seatwork" frequently connotes trivial activities - students coloring the figures in a story, working on tasks far below their level of achievement, doing busywork. From two perspectives, the BTES research suggests that this negative picture is not true. In the BTES study, the specific content of material the students were working on was coded. A special category was created to code material or activities which were "below the level" of the test" used in the study. Only 6 percent of the time was material coded as below the level of the test, suggesting that meaningless busywork is a relatively rare event (i.e., the standard deviations were also small).

Another way the BTES study looked at seatwork was by coding the error rate of student during seatwork. It might be expected that the error rate during seatwork would be lower than the error rate during teacher-led activities; that is, most teachers might place students at their "independent" level during seatwork and their "instructional" level during groupwork. In second-grade reading and in fifth-grade math, the error rate was the same in teacher-led settings and in seatwork; in second grade math and in fifth-grade reading, the error rate was only slightly lower in seatwork settings. Overall, there was no evidence that the seatwork was particularly easier than work in teacher-led groups.

Thus, although the allocation of a high percentage of time to seatwork is a necessity in current classrooms, the results suggest that seatwork activities are an integral and contributing part of classroom instruction, rather than trivial busywork.

INFLUENCING ENGAGEMENT DURING SEATWORK

The nature of heterogeneous classrooms and current instruction requires that students spend a large amount of time working alone at seatwork. Yet, as was shown in this study and in many others, students are less engaged when they are doing seatwork than when they are working with a teacher. At least three suggestions for increasing engagement during seatwork emerged from this study:

1. Increase substantive interaction during groupwork.
2. Increase substantive interaction during seatwork.
3. Keep seatwork time as low as possible.

SUBSTANTIVE INTERACTION DURING GROUPWORK

Given the higher engagement during groupwork, it is not surprising that the amount of time students spent in groupwork had a correlation of .31 with their overall engagement. But the substantive interaction which took place - explanations, questions and answers, and feedback - was an even stronger predictor of overall engagement, yielding a correlation of .45. In other words, although having students in teacher-led groups is positively related to student engagement, it is even better to use this group time for asking questions and giving feedback.

Other studies have shown that the frequent use of short, factual questions is positively correlated with gain in achievement, whereas other types of questions are often uncorrelated or negatively correlated with gain in achievement. It is thus suggested that explanation, asking frequent, short, factual questions, and giving feedback is the type of substantive interaction which is related to overall engagement.

The momentum of substantive interaction. Substantive interaction during groupwork not only is correlated with higher engagement during teacher-led activities, but it is also positively correlated with student engagement during seatwork, particularly in reading. The BTES authors suggest that using most of the time during group lessons for substantive interactions creates a sense of purposefulness, and students then apply this same momentum and efficiency to their seatwork.

Other studies (Rosenshine, 1978) have found that teachers with a strong academic focus in their classroom had students with higher gain in achievement. An emphasis on substantive interactions during groupwork may be another illustration of a strong academic focus.

SUBSTANTIVE INTERACTION DURING SEATWORK

The data on second- and fifth-grade reading and math can be thought of as falling into four quadrants. In three of the four quadrants, the amount of substantive interaction a student received during seatwork was positively (although moderately) related to student engagement during seatwork. The BTES report presents one dramatic

illustration of this finding. In second-grade math, the researchers divided classes that had over 70 percent seatwork into two groups: one group had substantive interaction during 11 percent or more of the seatwork time, and the other group had substantive interaction about 5 percent of the seatwork time (note that even “high” amounts of substantive interaction during seat work are relatively small). The engagement rate in the high interaction classes averaged 71 percent, whereas the engagement rate in the low interaction classes averaged 61 percent.

Unfortunately, the current analyses of the data did not answer a number of questions about seatwork, although these questions will be explored in the forthcoming secondary analyses of the data. Thus, we do not know the optimum proportions of seatwork and groupwork. The amount of time in seatwork may be dependent on the number of instructional groups a teacher has. In this study, the minimum amount of time spent in seatwork was about 35 percent of allocated time. This 35 percent might be seen as the natural lower limit, although we do not know if it is the optimal percentage.

SUBSTANTIVE DECREASING TIME IN SEATWORK

The BTES results suggest that in mathematics, increased time in seatwork tends to be negatively associated with engagement. That is, a class with 90 percent allocated time in seatwork frequently has a lower engagement rate than a mathematics class with 60 percent allocated time in seatwork. This may occur because seatwork in mathematics frequently consists of doing a large number of computational problems without immediate feedback, and the longer this goes on the more restless students (and adults) become.

Overall, substantive interaction during groupwork and during seatwork is related to higher engagement during seatwork, and in mathematics increased allocated time to seatwork is associated with diminishing returns. One caution, however; these are correlational results and need to be replicated in experimental studies.

HOW DO BREAKS AND TRANSITIONS AFFECT ENGAGEMENT?

We have sometimes thought that if students had more breaks, they would be more engaged the rest of the time, and engaged minutes would increase. Unfortunately, the current correlational data do not support this argument.

One of the categories, “wait time,” refers to time between instructional activities; it can also include time when a teacher is working with a few students and the others have finished one activity and are waiting for a new activity to begin. Although student wait time averaged only about 4 minutes a day, in the second grade, wait time was negatively correlated with student engagement rate in both reading and math. The negative correlations suggest that for second-grade students such waits do not constitute a refreshing break, and that the distraction which occurs during a wait transfers to less engagement during subsequent reading and math periods. These negative correlations did not occur for the older, fifth-grade students.

“Break time” was negatively correlated with engagement in both second and fifth grades. Breaks include recess, lunch, and in-class breaks such as unscheduled physical education and leaving class to use the restroom. The BTES staff believes that this suggests that relatively long and/or frequent breaks may establish a pattern of student “play” that carries over into periods of academic “work,” resulting in lower rates of work engagement. This finding seems similar to the previous one on substantive interaction: those teachers who emphasized an atmosphere of work obtained more student engagement during allocated academic time than those who were concerned that students have enough “play.” Of course, this does not suggest that effective classrooms were hard hearted sweatshops. Quite the contrary - even in the classrooms with the highest engaged minutes, students were engaged in reading and math activities no more than 50 percent of the in-class time.

SUMMARY

1. Time allocations. About 58 percent of the school day is allocated to academic activities, about 23 percent to nonacademic activities (e.g., music, art, physical education), and about 19 percent to noninstructional activities such as transitions between activities and class business.
2. Engaged time. On the average, students spent 1 hour and 30 minutes (second grade) and 1 hour and 55 minutes (fifth grade) actively engaged in reading and math activities. In the highest classrooms the engaged time was about 30 minutes longer, and in the lowest classrooms it was about 30 minutes less than the average.
3. On the average, students were engaged about 73 percent of the allocated time in reading and math. Teachers with the highest allocated time also had the highest engagement rates (about 82 percent). Thus, within the limits of this study, increasing allocated time did not lead to diminishing returns; quite the opposite, teachers who had more allocated time also had higher engagement rates.
4. During allocated time for academics; students were not engaged about 16 minutes an hour, on the average. Half of this nonengaged time was taken up with interim activities (e.g., passing out and collecting papers) or waiting for help, and the other 8 minutes were when students were clearly off task. Classrooms were fairly similar in interim and wait time, whereas the most efficient teachers reduced off-task time to 4 minutes per hour.
5. Seatwork. Overall; students spent about two-thirds of the allocated academic time in seatwork (or self-paced activities) and about one-third of their time working with an adult. Engagement was higher in teacher-led settings (about 84 percent) than in seat work settings (about 70 percent). An inevitable fact of classroom life is that if a teacher working alone divides a class into three groups, students will be working alone two-thirds of the time.
6. There was no evidence that seatwork activities were trivial. Seatwork activities were coded as "below the level of the test" only about 6 percent of the time.
7. Increasing engagement during seatwork. The amount of time teachers spent in substantive interaction - explanation, questions, student answers, and teacher feedback - was positively correlated with engagement during teacher-led activities. In addition, substantive interaction during groupwork was positively correlated with engagement during seatwork, suggesting that this substantive interaction creates a sense of purposefulness that students then apply to their seatwork.
8. Student engagement during seatwork increased when there was substantive interaction between teacher and student during seatwork. Such substantive interaction consisted of a teacher (or aide) monitoring seat work and holding students accountable by asking questions. Such substantive interaction was most effective when it occurred 11 percent or more of the seatwork time.
9. Break time. Break time (recess, lunch, in-class breaks, leaving class to use the restroom) was negatively correlated with engagement in both second and fifth grades. This suggests that teachers who emphasized an atmosphere of work obtained higher engagement than teachers who were concerned that students have enough "play." ■

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APPENDIX 1

General time categories

Reading and Language Arts

Reading and language arts refers to all time allocated to reading and language arts any time during the day, including reading and language arts activities in science, social studies, art, and music.

Mathematics

Mathematics refers to all mathematics activities during the day, in all subject areas.

Other Academic

Other academic instruction refers to academic instruction other than reading and mathematics. This includes social studies and science (where there is no reading or mathematics content).

Nonacademic

Nonacademic instruction includes music, art, structured physical education, flag salutes, sharing, and storytime.

Wait

Wait refers to periods of no activity or no movement between activities. This would occur when a student finishes his/

her work early and no other activity is initiated. However, waiting for help during reading or mathematics is counted as time in reading or mathematics.

Transition

Transition refers to periods of change from one activity to another. This includes lining up, taking seats, or quieting down before the next activity. However, time spent passing out reading or mathematics materials is counted as time in reading or mathematics.

Class Business

Class business refers to conduct of nonacademic class business such as distribution of notices, collection of milk money, or making arrangements for a field trip.

Break

Break includes any recreational or free period. It primarily refers to lunch and recess breaks, but also includes milk breaks, unstructured physical education, and leaving class to use the restroom.

APPENDIX 2

Average allocated time per day in different activities

Time category	Grade 2			Grade 5		
	Minutes per day	Combined minutes	Combined %	Minutes per day	Combined minutes	Combined %
Academic activities		2'12"	57%	1'50"	2'51"	60%
Reading and language arts	1'28"			1'50"		
Mathematics	36"			44"		
Other academic	8"			47"		
Nonacademic activities	55"	55"	24%	1'05"	1'05"	23%
Noninstructional activities		44"	19%		47"	17%
Transition	34"			34"		
Wait	4"			4"		
Housekeeping	6"			9"		
Major in-class time	3'51"	3'51"		4'44"	4'44"	
Lunch, recess, breaks	1'15"	1'15"		1'17"	1'17"	