

## Effects of Building Change on Indicators of Student Academic Growth

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*Student performance in relation to teacher evaluation has taken on increased importance. The Tennessee Value-Added Assessment System, a statistical process that provides measures of the influence that school systems, schools, and teachers have on indicators of student learning, was developed to distinguish factors affecting rates of student learning that can be controlled within the educational process. CREATE is honored to have a guest article by Dr. William L. Sanders, who developed the Tennessee Value-Added Assessment System. Dr. Sanders focuses his article on how the student outcomes assessment has led to identification of a surprising problem associated with students' change of building as well as delineation of hypotheses as to why the problem occurs.*

The Tennessee Value-Added Assessment System (TVAAS) is a statistical process that was developed to provide unbiased estimates of the influences that school systems, schools, and teachers have on the academic gains of students. All students in Tennessee grades 2-8 are tested annually via the Tennessee Comprehensive Assessment Program (TCAP). The Tennessee Educational Improvement Act of 1991 requires fresh, nonredundant, equivalent tests each year.

TVAAS uses student scale scores derived from the norm-referenced component of the TCAP as input into a statistical mixed model process to produce these estimates (for a more thorough discussion see Sanders and Horn, 1993 in press). Presently, the master database contains 1.7 million records merged longitudinally for all students who have been tested during the past four years.

When the first TVAAS reports of school system effects on student academic growth were being developed in late 1992, it was observed that certain systems had a noticeable drop in gain for all subjects at certain grades. However, the point of retarded gains varied from system to system. After further examination at the system level, it was hypothesized that the entry point into the receiving school could be causing the retardation in growth.

Subsequently, an analysis to test this hypothesis using all of the 1.7 million student records was initiated. Students' records are matched and merged over all systems in the state; thus, school change patterns are known. School configurations across the state vary enormously representing nearly all possible combinations of grades 2-8.

The mean gains in scale score (calculated from the simple difference between scale scores in adjacent grades for each student) for patterns of student transfers are presented in [Table 1](#). The population of Tennessee students is presented as three groups relative to transfer status: those who attended the same school in two contiguous years, those who changed schools and entered the new school at the lowest grade level offered in the receiving school, and those who changed schools but entered the new school at any grade other than the lowest offered. For ease in comparison, the mean gain for each transfer status is expressed as a percentage of the mean gain of nontransfer students.

The population in each subject-grade combination is extremely large. The smallest population size is  $N=9,745$ , signifying the number of second graders who transferred to a school where the lowest grade was the third grade. Due to the large  $N$ s, the standard error of each mean is negligible and thus not reported.

### **Finding 1:**

**The negative effect of student transfer to any grade other than the lowest grade offered in the new school is negligible for transfers prior to the seventh grade.**

Although there is a negative effect greater than 5 percent in the sixth grade in social studies and in the third grade in language arts, these are isolated effects that may reflect influences other than the effects of transfer. On the whole, transfer students make similar or better gains in the year following the school change than students who remain in their home schools. However, the effects of transfer are entirely different when students transfer to the lowest grade in the new school building.

### **Finding 2:**

**The mean gain for students who transfer to the lowest grade of their new school is measurably lower in all 25 subject-grade combinations than students who stayed in the same school and those who transferred to schools at grade levels other than the lowest offered.**

Except for fifth grade reading, third grade language arts, and fourth grade science and social studies, all subject-grade combinations show a negative effect on gain of 10 percent or greater when compared with other transfer student gains. Severe retardation in gains was most pronounced in grades six and seven, the grades at which many school systems routinely transfer students *en masse* to middle school or junior high.

### **Implications:**

These findings indicate that there may be major disruption in a child's academic progress associated with school change. For many children, building change occurs when they leave primary school, intermediate school, and middle or junior high school, so the opportunity for a collective impairment to their overall academic progress is most likely.

At first glance, many would speculate that the dominant cause of the reduction in gain was primarily due to environmental and social adjustment factors. However, these results tend to negate this argument, because it would be reasonable to assume that the individual student changing from one school to another would be influenced by the social adaptation problems, perhaps even more than when a population of peers is making the collective move. If this is reasonable, then the difference in subsequent gain observed between the two groups is more likely attributable to institutional factors.

1. There may be a breakdown in communication between sending and receiving schools that leads to excessive reteaching and lack of continuity of instruction.
2. Acclimation and processing of entering students may infringe upon instructional time.
3. Teachers may be using the first several weeks of school to become acquainted with their students' abilities and levels of achievement.

The factors hypothesized above may or may not be applicable to any specific school situation, so receiving school administrators who observe a drop in academic gains may also want to consider local factors that could be contributing to the retardation of student achievement. Since sustained academic growth is most desirable, local educational leaders are advised that elimination of institutional impediments may contribute dramatically to the likelihood of such growth.

### **References**

Center for Research on Educational Accountability and Teacher Evaluation. *Evaluation Perspectives*, January 1994, Vol.4, Number 1. Western Michigan University.

Sanders, W.L. and Horn, S.P. (in press). The Tennessee Value-Added assessment system (TVAAS): Mixed model methodology in educational assessment. *Journal of Evaluation in Education*.

### **Annotations**

<sup>1</sup> TVAAS Research and Software Development Team

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**Table 1. Effects of Building Change on Students' Academic Gain**

Grade	Were Students in this School the Previous Year?	Was the Receiving Grade the Beginning Grade in the Receiving School?	N	Math		Reading		Language		Science		Social Studies	
				Mean Gain	Mean Gain as Percent of 'No School Change'	Mean Gain	Mean Gain as Percent of 'No School Change'	Mean Gain	Mean Gain as Percent of 'No School Change'	Mean Gain	Mean Gain as Percent of 'No School Change'	Mean Gain	Mean Gain as Percent of 'No School Change'
3	Yes		131,138	47.3	100.0	26.6	100.0	23.3	100.0	24.5	100.0	31.4	100.0
	No	No	22,594	47.0	99.4	27.6	103.8	22.1	94.8	25.6	104.5	32.9	104.8
		Yes	9,745	42.3	89.4	23.2	87.2	21.9	94.0	20.8	84.9	28.6	91.1
4	Yes		129,353	30.4	100.0	21.5	100.0	15.4	100.0	25.1	100.0	27.6	100.0
	No	No	22,616	31.0	102.0	22.3	103.7	15.3	99.4	24.9	99.2	27.7	100.4
		Yes	10,612	25.4	83.6	19.6	91.2	13.0	84.4	24.1	96.0	26.1	94.6
5	Yes		121,585	25.0	100.0	22.4	100.0	22.2	100.0	15.3	100.0	18.6	100.0
	No	No	21,748	25.1	100.4	21.9	97.8	22.2	100.0	17.3	113.1	21.8	117.2
		Yes	18,219	22.3	89.2	20.0	89.3	19.0	85.6	13.5	88.2	16.8	90.3
6	Yes		93,902	20.8	100.0	16.6	100.0	15.2	100.0	15.0	100.0	5.3	100.0
	No	No	16,163	20.0	96.2	17.3	104.2	15.1	99.3	15.0	100.0	4.7	88.7
		Yes	50,690	16.0	76.9	12.4	74.7	11.1	73.0	12.1	80.7	1.0	18.9
7	Yes		87,683	17.3	100.0	13.3	100.0	13.9	100.0	15.5	100.0	8.7	100.0
	No	No	16,231	14.2	82.1	12.6	94.7	11.6	83.5	15.4	99.4	8.1	93.1
		Yes	54,794	12.1	69.9	9.3	69.9	8.0	57.6	13.2	85.2	4.4	50.6

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