

**STUDENT ACHIEVEMENT AND ABCTE PASSPORT TO TEACHING CERTIFICATION  
IN ELEMENTARY EDUCATION**

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## ABSTRACT

In this study we find that elementary classroom teachers who would have earned the American Board for Certification of Teacher Excellence (ABCTE) *Passport to Teaching* certification based on their proficiency in teaching knowledge and subject area expertise produce much higher student learning gains in all subject areas, particularly math and science, than teachers who would not have earned certification.

The ABCTE *Passport to Teaching* program is designed to be an alternative certification route for mid-career professionals transitioning to the classroom. The mission of the ABCTE is to develop and provide an effective and efficient teacher certification process that enhances teacher quality. *Passport to Teaching* is the national teacher certification program offered by ABCTE. Currently, certifications are available in elementary education (K–6), English/language arts (6–12), mathematics (6–12), general science (6–12), biology (6–12), physics (6–12), chemistry (6–12) and special education (K–12). ABCTE also offers a reading endorsement for certified elementary education teachers.

Teacher quality is a key determinant of student achievement, more important than any other societal or demographic factor. An effective and efficient teacher certification process, such as the one offered by ABCTE, is critical to meeting the challenge of ensuring an adequate supply of qualified teachers for the nation's schools.

We conducted this validity study to determine whether there is a correlation between scores on ABCTE's exams for elementary education certification and teachers' student learning gains as reported on their latest individual Tennessee-Value-Added System (TVAAS) report. Tennessee has had considerable experience in matching students to teachers to measure the progress of teachers'

students and also has extensive databases. This study is among the first studies to validate a licensure examination by the criterion of how much each teacher's students learn.

All study participants took ABCTE's computer-based Professional Teaching Knowledge exam and Multiple Subject Exam and submitted a copy of their most recent TVAAS report. Seventy-five of the participating teachers taught at the elementary level; of these, 54 taught in self-contained classrooms in which teachers were responsible for mathematics, science, reading, and social studies instruction.

The results of the study confirm that current teachers would have earned certification through the alternate *Passport to Teaching* route produced student outcomes greater than those who would have failed. Further studies with larger sample sizes and different certification subject areas are necessary to confirm the data compiled in this study. A larger study that gathers teacher data on previous educational background, college admissions test scores, and other certification exams scores will address whether the ABCTE examinations offer any additional information about their candidates.

## ABOUT ABCTE PASSPORT TO TEACHING

All candidates for *Passport to Teaching* certification must hold a bachelor's degree and demonstrate mastery on rigorous examinations of subject area and professional teaching knowledge. Prior to earning certification, candidates must also pass a federal background check.

*Passport to Teaching* is a four-step process that offers individualized preparation:

1. Candidates enroll in *Passport to Teaching*.
2. Candidates complete an online Self-Assessment survey to identify strengths and weaknesses in their teaching and content knowledge. Based on the Self-Assessment, certification candidates work with an experienced teacher (Learning Plan Advisor) to develop an Individualized Learning Plan. This plan recommends materials and resources to prepare the candidate for certification. Candidates are not required to take additional college courses, but may choose to do so for preparation purposes. (Individuals seeking Pennsylvania certification will be required to complete additional coursework).
3. To earn the *Passport to Teaching* certification, candidates must demonstrate mastery on the computer-based examinations. Each exam has a single national cut scores. The assessments are administered at secure testing centers located throughout the world, and must be completed within one year of enrollment.

With a *Passport to Teaching* certificate, successful candidates can apply for a teaching license in the states of Florida, Idaho, Mississippi, New Hampshire, Pennsylvania and Utah. ABCTE is also actively working to earn recognition for *Passport to Teaching* in other states. After earning the *Passport to Teaching*, teachers are eligible to participate in ABCTE's mentoring program.

## STUDY CONTEXT

*If an assessment is used to make decisions affecting any candidate's employability, opportunities, or compensation, then the licensure organization has an obligation to prove that the certification examinations (or the criteria) used to judge the professionals are valid. There is one way to prove validity—show that people who pass the examinations can perform at a higher level than those who fail. Certification examinations are valid when scores correlate positively with people's ability to perform the job (Hale 2000).*

Teacher quality has a greater effect on student achievement than any other societal or demographic factor (Sanders and Rivers 1996). Determining whether an association exists between student achievement and earning *Passport to Teaching* certification is important to ensure ABCTE is certifying candidates with the knowledge necessary to be effective in the classroom. ABCTE conducted a study in three major Tennessee school districts to determine whether such an association exists.

### **Certification Exam Validation Based on Value-Added Student Achievement**

Although performance on teacher licensing examinations should correlate with student achievement, no study has determined whether teachers' higher scores on teacher licensing examinations such as the Praxis II series are associated with their students' learning (Walsh and Tracy 2004). Among the initial teacher licensure examinations in use nationwide, this study is the first designed to validate a licensure examination by the criterion of how much each teacher's students learn.

### **Importance of Teacher Subject Area and Professional Teaching Knowledge**

Teachers' academic competence in general and in specific subject areas consistently correlates with measurable student learning gains (Whitehurst 2002). Careful examination of the results of the

National Educational Longitudinal Study of 1988, as well as those of the more recent 1998 survey, similarly shows a consistent relationship between mathematics teachers who are well trained in their subject area and higher student scores on standardized mathematics tests (Goldhaber and Brewer 1999).

Teaching practice research also notes that well-ordered classrooms and carefully structured instruction tend to produce greater learning gains (Brophy and Good 1986). Moreover, positive disciplinary climates are linked directly to student learning (Barton, Coley, and Weglinsky 1998).

### **Effectiveness of Alternatively Certified Teachers**

Nearly two decades of experience and research show the potential of alternative certification to help fill the need for qualified teachers. For example, in Connecticut, most supervisors found alternate route teachers superior to teachers from traditional preparation programs (Feistritzer and Chester 2003). Studies by the New Jersey Department of Education found that teachers who came through alternative routes had higher licensure exam scores and were more likely to remain in teaching beyond the second year than were their peers from conventional teacher-training education programs (Klagholz 2000).

Several other recent reports validate that teachers certified through alternate routes produce student outcomes equal to or greater than those of teachers certified through traditional programs. For example, a 2004 report from Mathematica Policy Research concluded that teachers who participated in the alternate-route Teach For America program produced higher levels of student learning in mathematics and equivalent levels of student learning in reading than traditionally certified new and veteran teachers (Decker, Mayer, and Glazerman 2004).

A 2005 study by the National Bureau for Economic Research analyzed more than 6,000 teachers completing one of several alternate route programs. In the long term, no difference could be ascertained in the results of students educated by teachers who entered the profession through an alternate route and those certified through traditional programs (Boyd, Grossman, Lankford, Loeb, Wyckoff 2005).

Mathematica also surveyed principals of ABCTE-certified teachers in 2006 and found that, as a group, they were judged to be more effective than both first-year and all other teachers in all 11 areas of teacher effectiveness (Glazerman, Tuttle, and Baxter 2006).

### **Value-Added Measures of Teacher Effectiveness**

The federal No Child Left Behind Act, enacted by the 107<sup>th</sup> Congress in 2002 requires “the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities,” including teacher effectiveness. Taking a value-added approach to assessing teacher performance is the best way to meet that requirement.

Value-added models focus on student learning gains to examine the impact of the teacher on the student’s achievement. Value-added calculations are designed to minimize outside influences by controlling for factors such as race, family background, and socioeconomic status.

Value-added achievement measures the learning progress (i.e., achievement gains over a year or another period) of a teachers’ students. Because value-added approaches are more fair and objective than other methods, they are increasingly employed and widely recognized. For example, the Teaching Commission, a bipartisan group chaired by former IBM Chairman and CEO Louis V. Gerstner Jr. and composed of former governors and business executives, concluded that value-

added approaches can be used to gauge an individual teacher's effect on student learning. The data from the model show how each student performs on a year-to-year basis, compared with his or her "expected score," which is calculated on the basis of the pupil's results on prior tests.

## **STUDY METHODOLOGY**

William Sanders first called national attention to value-added calculations in Tennessee, and the state has considerable experience in matching students to teachers to measure the progress of the teachers' students. For this reason and because the state retains extensive databases, Tennessee was chosen for the validation study.

### **Description of Teacher Sample**

A sample of 77 teachers in elementary school grades four through six participated in the study by completing the two ABCTE certification examinations necessary for elementary education certification: the Professional Teaching Knowledge exam and the Multiple Subject Exam.

The participants taught in three major urban Tennessee districts. These school districts have a combined student population that is 62.6 percent minority and 63.4 percent economically disadvantaged, according to the 2004 Tennessee Report Card. The participants agreed to submit their TVAAS student achievement reports with the understanding that the results would remain confidential. To encourage maximum effort on the exam, participants were compensated at a base level of \$75 up to \$200 per exam depending on their exam performance relative to the study mean.

Although, the participants did not have the opportunity to prepare for the exams, the pass rates for participants were similar to teachers who serve as field test participants for ABCTE exams. Had they

been given the opportunity to study specifically for the exams, participants might have scored higher. However, the study does take a snapshot of the knowledge base of a teacher at the time of the student achievement results.

### **Student Achievement Calculations**

The value-added student achievement scores were obtained from the TVAAS reports. Individual teacher scores are based on the mixed-methods model developed by William Sanders and are expressed as normal curve equivalent scores (NCEs). Teachers were given average student learning gain scores by subject area and year on their report.

An NCE score of zero means that the average student of a teacher gained one year's growth in achievement during a school year. A positive score indicates that the teacher's students achieved above-average growth, compared with students in the rest of the state. In other words, they gained more than a normal year's achievement while taught by a particular teacher. A negative NCE score means the teacher's students attained less than one year's growth in achievement. NCE scores for the four subject areas—math, reading, science and social studies—typically range two or three NCE points from “exceptional” to “deficient” (see Appendix A).

### **Self-Contained Elementary Classroom Teachers versus All Elementary Classroom Teachers**

Of the 77 elementary classroom teachers who participated in the validity study, 55 had TVAAS student result reports for all four subject areas, indicating they taught in a self-contained classroom and were responsible for teaching their students all subject areas in the Tennessee Comprehensive Assessment Program. Because their students were tested in the same subject areas covered by ABCTE's Multiple Subject Exam, this set of teachers is the most relevant for assessing the validity of the *Passport to Teaching* certification in elementary education. (See Appendix C for more on

ABCTE's teacher licensure examinations.) The 22 teachers not in self-contained classroom settings were not included in the analysis because they do not have a valid comparison group. Those teachers did not teach all subject areas, so they could spend more time on one or more subjects.

## **STUDY FINDINGS**

The analysis contrasts all self-contained elementary classroom teachers whose examination scores would qualify them for ABCTE certification with those who would not receive certification. To pass, ABCTE candidates must demonstrate proficiency on both the Professional Teaching Knowledge (PTK) exam and the Multiple Subject Exam (MSE).

The 13 teachers scoring at the proficient level on both certification examinations, therefore meeting the certification criteria, are referred to as "passing" teachers. The other 42 teachers failing one or both of the examinations, therefore not meeting the certification qualifications, are referred to as "failing" teachers.

Overall improvement in student's achievement is a combined average of student performance in all four subject areas tested by Tennessee. Students of passing teachers made positive gains in relation to their peers, while students of failing teachers did not make as much progress. The difference in student achievement between passing and failing teachers is a 1.04 NCE gain advantage for students of passing teachers (significant to the  $p < .05$  level.)

Teachers who met the ABCTE certification requirements for elementary education produced greater academic achievement from their students than teachers who did not meet the requirements. The greatest difference in student learning gains by individual subject area was in mathematics; passing

teachers' students had a 2.38 NCE gain advantage (significant to the  $p < .01$  level). In addition, the students of passing teachers showed higher learning gains in science and social studies.

The average learning gains of the students of passing teachers were all above zero, indicating that passing teachers' students exceeded one year's progress in all subjects. Except in reading, failing teachers' students made less than one year of progress, compared with their peers. The difference in NCE gains between passing and failing teachers approached statistical significance but only mathematics was small enough to report.

*Table 1: Normal Curve Equivalent Scores for Students of Passing and Failing Teachers*

	<b>Passing</b>	<b>Failing</b>
Number of Teachers	13	42
<b>Overall Student Achievement</b>	<b>0.85*</b>	<b>-0.19</b>
Mathematics	2.12**	-0.26
Reading	0.17	0.18
Science	0.44	-0.49
Social Studies	0.59	-0.38

\* The difference between passing and failing teachers is statistically significant to the 5 percent level.

\*\* The difference between passing and failing teachers is statistically significant to the 1 percent level.

### **Size of Student Learning Gains**

The 2004 TVAAS Report Card scale offers another way to compare the magnitude of the student NCE changes (see Appendix A). The report card expresses the scores as conventional academic grade points based on ranges of NCE changes. From these a grade point value was assigned, based on the typical 4.0-point scale, for each subject area's student learning gain level. A grade point average (GPA) was then computed for the students of each group of teachers.

Passing teachers' students received an average B+, or 3.36 GPA, for the teachers' impact on student achievement, while failing teachers' students achieved an average C or 2.0 GPA (see Table 2 below). Results based on teachers passing the individual certification examinations also are shown. The table shows the importance of both exams in determining licensure because of the combined impact of passing both exams over either exam individually.

*Table 2: Grades of Students of Passing and Failing Teachers*

	<b>Pass</b>	<b>Fail</b>
<b>Level of Gains</b> (based on 2004 TVAAS Report Card)		
Mathematics	A	C
Reading	C	C
Science	A	C
Social Studies	A	C
<b>Cumulative GPA</b>	<b>3.36</b>	<b>2.0</b>

No definitive causality can be attributed to passing a teacher certification exam and having a positive effect on student learning gains. However, this study does show that current teachers who demonstrate they possess the knowledge required to pass the ABCTE exams have greater student learning gains than those teachers who do not. The results suggest that policymakers who are considering the use of ABCTE as an alternative certification route can be confident that ABCTE assesses the knowledge necessary to be an effective teacher.

## ADDITIONAL STUDY CONDUCTED ON ABCTE MATHEMATICS CERTIFICATION

We recently examined the validity of the exams necessary for candidates in the *Passport to Teaching* mathematics certification program. The study investigated the relationship between exam proficiency and student achievement by assessing currently certified mathematics teachers.

The study measured skill in mathematics as well as teaching knowledge through the ABCTE certification exams. Teacher effects on student achievement were also measured by teachers' TVAAS reports.

When teachers were given the opportunity to participate in the study, they understood that they would need to present a copy of their 2004 TVAAS report. It is fair to say the study attracted a self-selecting group of teachers that showed higher levels of student achievement than average. The mean student learning gains of the sample population was 1.46 NCE gain, which is almost A-level student achievement according to the 2004 TVAAS Report Card. The nature of this high-achieving sample population makes finding significant differences in student learning gains more difficult.

Despite the limitations of the sample, the study found significant differences in student learning gains between those teachers who demonstrated greater knowledge in teaching and mathematics content than those proving to be less knowledgeable.

*Table A. Student Learning Gains of Teachers based on Professional Teaching Knowledge Exam Scaled Score*

	n	Average PTK Scaled Score	System- adjusted NCE Gain	TVAAS Report Card Grade
Passing (above 270)	52	289.1	2.13	A
Failing (below 270)	26	245.5	0.10	C

The difference in student NCE gains is statistical significant at the  $p=0.01$  level.

Table B. Student Learning Gains of Teachers based on Mathematics Exam Scaled Score

	n	Average Math Scaled Score	System- adjusted NCE Gain	TVAAS Report Card Grade
1 Std. Dev. Above Mean	15	263.7	2.51	A
1 Std. Dev. Below Mean	10	177.0	0.79	B

The difference in student NCE gains is statistical significant at the  $p=0.14$  level. (See *Appendix C*.)

## APPENDICES

### Appendix A: 2004 Tennessee Value-Added Assessment System/Value-Added Grade Scale

The table below shows the grade scale used by Tennessee to give a reference point for the levels of normal curve equivalent (NCE) gains made by schools and districts. Generally the top 20 percent of schools and districts receive “exceptional” status based on their students’ improvement in that subject area. The next 20 percent of schools and districts receive an “exceeds state growth standard” status, and so on. Considering the results of self-contained teachers in the same manner yields a better understanding of study participant’s collective magnitude of NCE gains.

Grade	Status	Normal Curve Equivalent Mean Gain Range			
		Reading/ Language Arts	Mathematics	Social Studies	Science
A	Exceptional	> 1.2	>1.5	>0.4	>0.6
B	Exceeds State Growth Standard	0.7 to 1.2	0.5 to 1.5	-0.1 to 0.4	-0.2 to 0.6
C	Maintains State Growth Standard	- 0.1 to 0.6	-0.5 to 0.4	-0.8 to -0.2	-1.1 to -0.3
D	Below State Growth Standard	-0.6 to -0.2	-1.9 to -0.6	-1.6 to -0.9	-1.9 to -1.2
F	Deficient	<-0.6	<-1.9	<-1.6	<-1.9

Source: *Tennessee 2004 Report Card* [online]. Available at: <http://www.k-12.state.tn.us/rptcrd04/gradescale.htm>

### Appendix B: Characteristics of Elementary Study Participants

Participants for the study had a wide range of teaching experience and education background. Most of the teachers held a professional license. The overall student learning gain average for all study participants was 0.06 NCEs. Which means we recruited a representative population of teachers in terms of their impact on student achievement.

The table below shows the breakdown of participants in terms of those passing and failing, teaching experience, highest degree attained, and licensure level. The numbers show that passing and failing ABCTE certification requirements had no bias towards one type of teacher over another.

	<b>Pass</b>	<b>Fail</b>
Years Experience Teaching	16.8	13.8
Bachelor's Degree	44.4%	41.7%
Master's Degree	55.6%	52.8%
Doctorate	0.0%	5.6%
Apprentice License	11.1%	2.8%
Professional License	88.9%	97.2%

### **Appendix C: ABCTE Examinations**

ABCTE examinations are developed using the same methodology for each subject area. The assessments are criterion-referenced by design and are based on ABCTE content standards, test blueprints, performance objectives and test/item specifications. All ABCTE assessments are developed so that their scores have a high degree of internal consistency (reliability) and are valid measures of an individual candidate's knowledge of the subject area(s) assessed.

Examination development involves subject matter experts (e.g., scholars, teachers, principals, administrators, teacher educators and curriculum developers) in the appropriate content area at each step of the process. These test development activities are led by ABCTE personnel and third-party contractors. Current ABCTE certification areas also include: General Science, Biology, Chemistry, Physics, Mathematics, English/Language Arts, and Special Education.

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