

## A Study of Teacher Certification and Student Achievement

### Introduction

Do students of teachers who have certification in a particular content area achieve significantly higher in that content area than students of teachers who do not hold such certification? There is certainly a pressing need to research this question since school and teacher accountability are once again at the forefront of political discourse.

### Data for the Study

Data from the National Assessment of Educational Progress (NAEP) were used to answer the research question. This study focused on the NAEP scores of 4<sup>th</sup> grade students in the three content areas of Mathematics (1996, 2000), Reading (1992, 1994), and Science (1996, 2000).

The NAEP Data Tool that is available at <http://nces.ed.gov/nationsreportcard/naepdata/> was used to analyze the data for this study. The NAEP Data Tool was used to check if there were any statistically significant differences between the NAEP scores of students in a content area whose teachers were certified in the same content area and the scores of students whose teachers were not certified.

### Results of the Study

The NAEP scores of 4<sup>th</sup> grade students whose teachers reported that they were certified in elementary math were compared with the NAEP scores of the students whose teachers reported they did not hold such certification.

<b>Table 1. Mathematics Assessment Scores and Teacher Certification Status – Grade 4, Year 1996</b>						
“Do you have teaching certification in any of the following areas that is recognized by the state in which you teach? Elementary mathematics (teacher-reported)” N=3722						
Yes		No		Not Offered in State		Significant Difference?
Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	NO
224 (2.2)	42% (3.5)	221 (1.8)	35% (3.4)	226 (2.3)	23% (2.8)	
“Note: The score scale for this subject ranges from 0 to 500.”						
“SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 Mathematics Assessment”						

As shown in Table 1, no significant differences were found. As Tables 2 through 6 show, there were no significant differences in any of the three content areas of Mathematics, Reading, and Science for any of the years that were included in this study.

<b>Table 2. Mathematics Assessment Scores and Teacher Certification Status – Grade 4, Year 2000</b>						
“Do you have teaching certification in any of the following areas that is recognized by the state in which you teach? Elementary mathematics (teacher-reported)”						
N=4420						
Yes		No		Not Offered in State		Significant Difference?
Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	NO
227 (1.8)	30% (2.6)	226 (1.7)	48% (2.7)	231 (1.8)	22% (2.0)	
“Note: The score scale for this subject ranges from 0 to 500.”						
“SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Mathematics Assessment”						

<b>Table 3. Reading Assessment Scores and Teacher Certification Status – Grade 4, Year 1992</b>						
“Do you have teaching certification in any of the following areas that is recognized by the state in which you teach? Reading (teacher-reported)”						
N=3132						
Yes		No		Not Offered in State		Significant Difference?
Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	NO
217 (2.4)	23% (2.6)	217 (1.7)	76% (2.7)	222 (10.0)!	2% (0.6)	
“! The nature of the sample does not allow accurate determination of the variability of the statistic. Note: The score scale for this subject ranges from 0 to 500.”						
“SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1992 Reading Assessment”						

<b>Table 4. Reading Assessment Scores and Teacher Certification Status – Grade 4, Year 1994</b>						
“Do you have teaching certification in any of the following areas that is recognized by the state in which you teach? Reading (teacher-reported)”						
N=3708						
Yes		No		Not Offered in State		Significant Difference?
Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	NO
216 (2.8)	25% (2.7)	213 (1.4)	73% (2.8)	231 (10.7)!	2% (1.2)	
“! The nature of the sample does not allow accurate determination of the variability of the statistic. Note: The score scale for this subject ranges from 0 to 500.”						
“SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1994 Reading Assessment”						

<b>Table 5. Science Assessment Scores and Teacher Certification Status – Grade 4, Year 1996</b>						
“Do you have teaching certification in any of the following areas that is recognized by the state in which you teach? Elementary science (teacher-reported)”						
N=3656						
Yes		No		Not Offered in State		Significant Difference?
Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	NO
151 (2.3)	43% (3.5)	146 (2.7)	35% (3.3)	152 (3.1)	22% (3.1)	
Note: The score scale for this subject ranges from 0 to 300.”						
“SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 1996 Science Assessment”						

<b>Table 6. Science Assessment Scores and Teacher Certification Status – Grade 4, Year 2000</b>						
“Do you have teaching certification in any of the following areas that is recognized by the state in which you teach? Elementary science (teacher-reported)”						
N=5607						
Yes		No		Not Offered in State		Significant Difference?
Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	Average Score (Standard Error)	Row Percentage (Standard Error)	NO
150 (2.1)	31% (1.9)	147 (1.3)	48% (2.4)	153 (1.9)	21% (1.9)	
Note: The score scale for this subject ranges from 0 to 300.”						
“SOURCE: U.S. Department of Education, Office of Educational Research and Improvement, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 Science Assessment”						

## Discussion of Findings

Given the finding that elementary certification in the three content areas of Mathematics, Reading, and Science did not make a statistically significant difference in student’s NAEP scores in the respective content areas, a question that immediately comes to one’s mind is: “Is content area certification really necessary for elementary teachers?”

On the other hand, one can also ask questions such as “How can certification requirements for elementary teachers be improved?” and “What changes should be made to elementary teacher education programs in order to make content area certification more effective at the elementary level?” Another question that comes to mind is “How many content courses and methods courses should teachers be expected to complete before they are eligible to receive certification in specific content areas?” Questions about the role that the content knowledge of elementary teachers plays in how well their students perform on NAEP and other assessments also need to be researched.

## **Limitations of the Study**

The NAEP data used for this study do not include a truly representative sample of teachers in the United States. However, the NAEP data do include the teachers of the sample of students who participated in the assessment and who are representative of all 4<sup>th</sup> grade students in this country.

## **Suggestions for Further Research**

The question regarding the relationship between teacher certification and student achievement needs to be studied using non-NAEP data sources. The sample of teachers in these other data sources will hopefully be more representative of the population of teachers in this country.

The NAEP data available for various states in this country also needs to be analyzed to determine if similar results are obtained. Comparing elementary teacher certification requirements in States with high student scores on NAEP with those of low scoring States will provide valuable insights into what requirements work in terms of enhanced student achievement. Elementary teacher education programs in various States should also be similarly compared.

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