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NATIONAL BOARD CERTIFICATION: IMPACT ON STUDENT ACHIEVEMENT AND TEACHER PRACTICES

Overview

The combination of difficult economic times and increased accountability has led policymakers to call for evidence that students taught by NBPTS-certified teachers make greater achievement gains than those taught by non-NBPTS-certified teachers. Overall, studies show mixed results regarding the impact of National Board Certification on student achievement. Some research has found that students assigned to NBPTS-certified teachers make greater achievement gains than students assigned to non-NBPTS-certified teachers, while others have found no such differences. The results of studies have varied depending on the subject area, grade level, and group of teachers analyzed.

This review included two studies that can be considered among the most definitive available with regard to testing the efficacy of National Board Certification. Both studies addressed the key issue of whether students taught by NBPTS-certified teachers exhibit greater academic achievement gains than students taught by non-NBPTS-certified teachers. One study was conducted by Cantrell and colleagues (2008) and is to date the only research study addressing National Board Certification that has received the seal of approval (i.e., "well-implemented randomized controlled trial") from the U.S. Department of Education's What Works Clearinghouse. This type of recognition and evaluation carries considerable weight in the field of educational research at the present time. Cantrell and associates found minimal impact of National Board Certification on student achievement in the Los Angeles Unified School District.

The other important study, conducted within our own District and partially funded by the National Board for Professional Teaching Standards (Cavalluzzo, 2004), found what was described as "robust evidence" for National Board Certification. However, upon closer inspection, one finds a very small positive effect which would be equivalent, for the average student, to a difference of approximately one or two percentile points (Effect Size = 0.07 to 0.08, or 7 to 8 percent of one standard deviation) in favor of students taught by NBPTS-certified teachers. The fact that this finding was statistically significant should not imply high importance since the large sample size used in the study contributed to making such a small effect statistically significant. It can be argued that the size of the difference between NBPTS-certified and non-NBPTS-certified teachers may have been statistically significant, but not in a manner that makes a practical difference in the real world.

Research on the efficacy of National Board Certified teachers has produced some consistent findings. First, several studies have reported that future (not yet certified) NBPTS-certified teachers have a positive impact on student achievement, suggesting that those who obtain National Board

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Certification are more effective, even before they undertake the certification process, than the average teacher who is never certified. Second, studies have found a decline in teacher effectiveness during the application year, perhaps because the many hours involved in preparing application materials takes away from classroom preparation time. Finally, some researchers have found that students whose teachers applied for but failed to earn National Board Certification have lower achievement gains than students assigned to teachers who never applied for certification. Additional research is needed to explore possible explanations for this finding.

National Board Certification has been found to have a positive impact on teacher practice, morale, and participation in professional development and leadership activities. Studies on the impact of National Board Certification on teacher retention rates have found that NBPTS-certified teachers tend to stay in the teaching profession at higher rates than other teachers; however, National Board Certification may lead to increased teacher mobility within the profession, possibly as a result of certified teachers' ability to secure more favorable teaching assignments. Research has found that NBPTS-certified teachers are more likely to work in schools with fewer low-income, minority, and low-performing students. In addition, one study reported that NBPTS-certified teachers had a positive school-wide effect on student achievement and that school-wide performance continued to increase as more NBPTS-certified teachers were added to school faculty.

Studies conducted in M-DCPS have reported that NBPTS-certified teachers have a small but positive effect on students' academic achievement and a positive impact on the classroom environment. Although M-DCPS' NBPTS-certified teachers were found to teach more advantaged students, they appeared to be more equally distributed throughout the District's schools than has been the case nationwide.

In a practical sense, National Board Certification is voluntary and the process is rigorous and time-consuming. It is quite likely that only the better, more dedicated and competent teachers would be willing to submit to the program. Thus, to some degree, attaining certification becomes a self-fulfilling prophecy. Those teachers who end up certified are more likely to exhibit effective outcomes irrespective of the specific demands of the certification process. For these reasons, it is difficult to separate out the measurable attributes of the program from the simple self-identification of effective teachers.

If a certification program consisted of nothing more than requiring that teachers pass a content area exam, it might still be worthwhile. If financial and other benefits were attached to the certification, it might encourage competition among teachers, a gradual weeding out of less committed teachers, and an overall improvement of teacher effectiveness. The long-range benefits to the school system and its participants of even a minimal certification program might outweigh the debate of its technical merits.

The National Board of Professional Teaching Standards (NBPTS) was established in 1987 through a Carnegie Foundation grant as a way to define, assess, and recognize accomplished teaching. National Board Certification is an advanced teaching credential that complements, but does not replace, a state's teaching license. NBPTS participation is voluntary and renewals are only required once every 10 years. To apply for certification, teachers must have a bachelor's degree from an accredited institution of higher education, hold a state teaching license, and have taught for three years prior to submitting their application. NBPTS offers 25 certificates that cover 16 subject areas and are classified into seven student age categories. As of 2008, over 47,000 U.S. teachers had earned NBPTS certification and an additional 20,000 had applied for one of the certificates (National Board for Professional Teaching Standards, 2010; Cantrell et al., 2008; Harris & Sass, 2008).

Certification is achieved upon successful completion of a voluntary program that includes assessments and portfolio entries. The certification process typically takes one to three years to complete and most candidates spend between 200 and 400 hours preparing their portfolio alone. The portfolio portion of the assessment examines the ways teachers put theory into practice in their classrooms. Testing at the assessment center expands upon the portfolio and allows candidates to demonstrate the scope of their content-specific knowledge (National Board for Professional Teaching Standards, 2010; Cantrell et al., 2008; Harris & Sass, 2008; Humphrey et al., 2004; Vandevort et al., 2004).

National Board Certification fees include a \$65 non-refundable application processing fee, a \$500 non-refundable initial fee (applied to the assessment fee), and a \$2,500 assessment fee (National Board for Professional Teaching Standards, 2010). A majority of states, as well as the federal government, promote NBPTS certification by financing or subsidizing the application and assessment fees and by providing additional compensation for teachers who become certified (Harris & Sass, 2008; Goldhaber & Hansen, 2007). Recently, however, large deficits in state budgets have resulted in some states reducing or eliminating bonuses and subsidies. Education Week's *Quality Counts* reported that between 2007 and 2009, the number of states indicating they offered incentives for teachers to earn National Board Certification dropped from 38 to 31, an 18 percent decline (Sawchuk, 2010).

The combination of difficult economic times and increased accountability has brought pressure on all educational initiatives, including National Board Certification, to demonstrate that they produce results. Policymakers are calling for evidence that students taught by NBPTS-certified teachers make greater achievement gains than those taught by non-NBPTS-certified teachers (Smith et al., 2005; Goldhaber & Anthony, 2004; Humphrey et al., 2004; Archer, 2002). Although numerous studies confirm that students who have high quality teachers post significant and lasting achievement gains, measuring the impact of National Board Certification on student achievement has proven difficult (Harris & Sass, 2008; Holding, 2006; Lustick & Sykes, 2006; Humphrey et al., 2004).

Research on the Impact of National Board Certification on Student Achievement

In general, studies show mixed results regarding the impact of National Board Certification on student achievement. Often, findings vary depending upon the subject area, grade level, or group of teachers studied. Studies have been criticized on methodological and statistical grounds, such as small sample sizes that lack statistical power; large sample sizes that result in significant but meaningless differences; and inaccurate links between student data and teacher assignment. Furthermore, researchers have compared different groups of teachers; controlled for different student, teacher, classroom, and school variables; and measured impact in different ways (some using gain scores and some using current test scores only) (Hakel et al., 2008; Clotfelter et al., 2007; Goldhaber & Hansen, 2007; National Board for Professional Teaching Standards, 2007; McColsky et al., 2006). Bearing these limitations in mind, a summary of studies examining the impact of National Board certification on student achievement is provided below. It should be noted that many studies have been conducted in North Carolina because the state has been a leader in the national movement to have teachers certified by the NBPTS.

Studies Finding that National Board Certification has a Positive Impact on Student Achievement

- Vandevort, Amrein-Beardsley, and Berliner (2004) examined the relationship between National Board Certification and student achievement in grades 2-6 in 35 classrooms from 14 Arizona school districts. Student achievement was measured using 1999 through 2003 Stanford Achievement Test reading, math, and language gain scores. Results indicated that students of NBPTS-certified teachers averaged over 1.3 months greater gain per year in reading than students of non-NBPTS-certified teachers. In math, students of NBPTS-certified teachers averaged over 1.4 months greater gain than their peers. In language, the gain attributed to having studied with a

NBPTS-certified teacher averaged over three-quarters of one month's growth. When effect sizes were averaged across years and subjects, students of NBPTS-certified teachers averaged over 1.2 months greater gain than students in classrooms taught by non-NBPTS-certified teachers. It should be noted that Vandevort and colleagues' analyses did not control for student demographic characteristics that may have been correlated with assignment to NBPTS-certified teachers.

- Goldhaber and Anthony (2007) examined the relationship between teachers' National Board Certification status and student achievement in North Carolina. They analyzed 600,000 student observations and 32,000 teacher observations in grades 3-5 over a three-year period. The researchers controlled for a variety of student characteristics, including ethnicity, gender, eligibility for free or reduced price lunch, limited English proficiency, and disability status. Findings indicated that students of NBPTS-certified teachers had larger gains in reading, but not math, than students of non-NBPTS-certified teachers. Students of future (not yet certified) NBPTS-certified teachers had the largest gains and were most effective in raising the achievement of minority and low-income students, especially in math. The finding that future NBPTS-certified teachers had the greatest impact on student achievement suggests that teachers who obtain National Board Certification are more effective, even before they undertake the certification process, than the average teacher who is never certified.

Goldhaber and Anthony (2007) also found that the effectiveness of teachers during the application year was actually lower than teachers who did not become certified. They suggested that the 200 or more hours involved in preparing application materials may have taken away from classroom preparation time and therefore had a negative effect on student achievement.

- Hakel, Koenig, and Elliott's (2008) report for the National Research Council reviewed 11 studies that compared the achievement test scores of students with NBPTS-certified teachers to students with non-NBPTS-certified teachers. They concluded that students taught by NBPTS-certified teachers made greater gains on achievement tests than students taught by non-NBPTS-certified teachers. In addition, the researchers conducted supplemental analyses to evaluate the effects of Florida and North Carolina NBPTS-certified teachers on test scores. The supplemental analyses used data from 2000 through 2004 and examined the reading and math performance of fourth and fifth grade students. Findings indicated that students taught by NBPTS-certified teachers made slightly higher achievement test score gains than those taught by teachers who had not applied for certification. The magnitude of the effects varied for reading and math and by state. For example, there were slightly larger differences between students of NBPTS-certified and non-NBPTS-certified teachers in North Carolina, while the group differences in Florida were smaller. Furthermore, in Florida, NBPTS-certified teachers raised test scores more in reading than in math, while in North Carolina, NBPTS-certified teachers raised scores more in math than in reading. A decline in North Carolina teachers' effectiveness during the application year was also noted.

Hakel and colleagues (2008) also analyzed differences between students assigned to teachers who attempted but failed to earn certification and those assigned to teachers who had not applied for certification. They found that students assigned to unsuccessful applicants made smaller gains than those assigned to teachers who had not applied for certification. They concluded that National Board Certification "distinguishes more effective teachers from less effective teachers with respect to student achievement. The differences are small and not entirely consistent in absolute terms, but are substantively meaningful." The authors cautioned, however, that their findings don't explain whether the certification process itself makes teachers more effective or if high-quality teachers are attracted to the certification process.

- Bond, Smith, Baker, and Hattie (2000) compared student writing samples from 31 North Carolina NBPTS-certified teachers and 34 teachers who had failed to earn certification. They concluded

that students taught by NBPTS-certified teachers outperformed other students. Almost three-quarters (74 percent) of the students of NBPTS-certified teachers were judged to have demonstrated higher understanding through more relational and more abstract work, while only 29 percent of the writing samples from the students of non-NBPTS-certified teachers displayed these characteristics. The difference in the two groups of students' writing scores, while in the expected direction, was not significant. The researchers nevertheless concluded that the NBPTS is "identifying and certifying teachers that are producing students who differ in profound and important ways from those taught by less proficient teachers. These students appear to exhibit an understanding of concepts targeted in instruction that is more integrated, more coherent, and at a higher level of abstraction than understanding achieved by other students." It should be noted that Bond and colleagues did not control for student, teacher, or school factors that could have influenced their findings, such as demographic characteristics or students' prior achievement levels. In addition, the study is limited by its small sample size.

- Clotfelter, Ladd, and Vigdor (2007) used a longitudinal data set from North Carolina to examine the relationship between teacher credentials and students' state achievement test scores. All North Carolina students in grades three through five in 1995 through 2004 for whom the researchers could identify teachers of reading and math were included in the analyses. The researchers found that taken together, teacher credentials (including National Board Certification, licensure test scores, undergraduate institution attended, and number of years of teaching experience) appeared to have large effects on student achievement. Larger effects were found on math than on reading achievement. In math, teachers with weak credentials reduced students' achievement more than increasing an elementary class size by five students and was comparable to the effect associated with having poorly educated parents. In reading, having a teacher with weak credentials also had a negative effect on achievement, but was not as detrimental as having poorly educated parents. Although a positive association was found between National Board Certification and student achievement (confirming that NBPTS-certified teachers were more effective, on average, than non-NBPTS-certified teachers), the biggest differentials were associated with teacher experience and licensure status. Clotfelter and colleagues cautioned that their findings did not determine whether the National Board simply identified the most effective teachers or if the process made teachers more effective than they otherwise would have been.

Studies Finding that National Board Certification has Little or No Impact on Student Achievement

- Cantrell, Fullerton, Kane, and Staiger (2008) analyzed data on approximately 3,800 second through fifth grade students taught by 198 teachers in the Los Angeles Unified School District. Each teacher who had applied for NBPTS certification was matched with a comparison teacher who taught the same grade at the same school who had not applied for certification. Classrooms of students were then randomly assigned to either the NBPTS applicant or the comparison teacher. Analyses included 99 pairs of teachers. The researchers compared the math and language arts California Standards Test scores of students assigned to NBPTS-certified teachers, teachers who applied but failed to earn certification, and teachers who had not applied for certification. No significant differences were found between the math and language arts test scores of students assigned to NBPTS-certified teachers and those assigned to teachers who didn't apply for NBPTS certification. However, students assigned to teachers who failed to earn NBPTS certification had significantly lower test scores than students assigned to teachers who had never applied for certification. Additional research is needed to explore possible explanations for this finding. The reader should note that the U.S. Department of Education's What Works Clearinghouse judged Cantrell and colleagues' study to be a "well-implemented randomized controlled trial" (What Works Clearinghouse, 2008).

- Harris and Sass (2008) studied approximately 30,000 Florida math teachers (over 1,200 of whom were NBPTS-certified) and over 32,000 reading/language arts teachers (of whom nearly 1,500 were NBPTS-certified). The researchers compared grades 3-10 students' reading and math scores on both the FCAT SSS and FCAT NRT over a four-year period (2000-2004). After controlling for teacher, student, and school characteristics, Harris and Sass found that the effects associated with National Board Certification were not significant for either reading or math on the FCAT NRT. When the FCAT SSS was used as an outcome measure, the effects associated with National Board Certification were significant for reading.

In order to analyze the effect of National Board Certification by grade level, the researchers separately estimated student achievement for elementary, middle, and high school students. They found relatively consistent positive and substantial effects only for middle school math teachers prior to their earning NBPTS certification. Harris and Sass also investigated whether students' ethnicity, income, and prior achievement influenced the effect of National Board Certification. For the FCAT SSS, National Board Certification had no effect on students' test scores, but teachers who had not yet earned certification had a positive impact on the achievement of students receiving free or reduced price lunch. For the FCAT NRT, National Board Certification had no effect on students' test scores and pre-certified teachers had a negative effect on initially high achieving students' reading scores.

To determine if the certification process itself enhanced teacher effectiveness, Harris and Sass (2008) split the NBPTS certification indicator into three components: the time period prior to the application year, the time period during the application year, and the time period after which the teacher was certified. When scores from the FCAT NRT were used as the outcome measure, the results suggested a decline in effectiveness across the three time periods, indicating that achievement tended to be higher before teachers were certified than after they became certified. Results were mixed when the FCAT SSS was used as the outcome variable. In this case, decreases in effectiveness were evident across the three time periods, but effectiveness tended to increase beyond the first year after certification, suggesting that it may have taken time for teachers to implement the processes and strategies learned during the certification process.

Harris and Sass (2008) also found that early cohorts of teachers (those who became NBPTS-certified in 2001 or earlier) were more effective than teachers who became certified in later years. Teachers in the earliest cohort of National Board Certified teachers were more likely to have advanced degrees and have slightly more experience, compared to later cohorts of teachers. Since the basic NBPTS certification process has remained unchanged, the researchers hypothesized that teachers with higher initial quality were more likely to attempt and receive NBPTS certification in the earlier years.

In summary, Harris and Sass (2008) found that students of NBPTS-certified teachers do receive higher test scores in some grades, subjects, and years, but not in all. In addition, their results differed depending on whether the FCAT SSS or FCAT NRT was used as the outcome measure. The researchers stated: "Across our many alternative samples, specifications and measures of student achievement we occasionally find a positive signaling effect for a particular cohort of future National Board Certified Teachers for a particular test or grade level, but these are the exception, not the rule." They concluded that the "efficacy of NBPTS as a tool to improve student learning appears questionable."

- Sanders, Ashton, and Wright (2005) examined the effects of NBPTS-certification on the achievement of students from two large North Carolina school districts. NBPTS-certified teachers were compared to three different groups of teachers: teachers who had never been involved in the certification process; teachers who planned to attain certification in the future; and teachers who had failed in

their attempt at certification. Students' End-of-Grade reading and math test scores from 1999-2003 were compared, with controls for teacher years of experience and student gender and ethnicity. The researchers found that, on average, students of NBPTS-certified teachers did not have significantly greater rates of academic growth than students assigned to any other group of teachers and the estimated effect sizes were relatively small. Most importantly, the amount of variability among teachers within the same certification status was found to be considerably larger than the differences between teachers of different certification status. For example, some of the most effective teachers were NBPTS-certified, but so were some of the least effective teachers. Consequently, Sanders and colleagues stated that a student randomly assigned to a National Board Certified teacher was no more likely to get an "effective" teacher than a student assigned to a non-NBPTS-certified teacher. They concluded that the "current NBPTS certification process does a relatively poor job of distinguishing effective from ineffective teachers."

- Stone (2002) studied 16 NBPTS-certified teachers in Tennessee to see if they produced student achievement gains in one or more of five tested subjects: reading, language, math, social studies, and science. Data were gathered from Tennessee's Value Added Assessment System. Tennessee's performance standards for schools and school systems considered an annual gain in a given subject equal to or exceeding 115 percent of the national norm as "exemplary" and awarded a grade of "A." A gain of less than 85 percent was considered "deficient" and awarded a grade of "F." Findings indicated that the achievement gains made by students of NBPTS-certified teachers were no greater than those made by students assigned to other teachers. Considering the 16 teachers collectively, there were 123 teacher-by-subject-by-year teacher-effect scores. Only 15 percent of these scores reached the "exemplary" level and 11 percent were designated as "deficient." The remaining 74 percent of scores were within the average range for their school systems.

Several researchers have criticized Stone's small sample size, methodology, and resulting conclusions (Hakel et al., 2008; Cavalluzzo, 2004; Vandevort et al., 2004; Holland, 2002). Vandevort and colleagues (2004) also maintained that the value added approach was not effective in reducing year-to-year variation of teacher test scores due to the near-random assignment of students to teachers. For example, one teacher's students scored 38 percent above the district average one year, while in another year that same teacher's students scored at only 84 percent of the district average. In the Tennessee Value Added Assessment System, this teacher would have received a grade of "A" one year and a grade of "F" another year. Vandevort and colleagues concluded that "if a teacher's performance is so dependent on the luck of the draw of students they receive, determining teacher effectiveness by this kind of value added model is seriously flawed."

- Stephens (2003) matched NBPTS-certified and non-NBPTS-certified teachers in two South Carolina school districts. She compared students' scores on South Carolina's 2002 Palmetto Achievement Challenge Test (PACT). Analyses included 154 students of NBPTS-certified teachers and 669 students of non-NBPTS-certified teachers. Students were matched on their prior year's PACT scores and Stephens controlled for teachers' levels of experience as well as the poverty level of the school. In the majority of comparisons (87 percent), no significant differences were found between the achievement of the two groups of students. Vandevort and colleagues (2004) cautioned that this study's statistical power was severely limited because Stephens had difficulty matching teachers. Therefore, the number of students for which there were data was very small for some of the comparisons.
- McColskey and colleagues (2006) examined the relationship between National Board Certification and North Carolina students' End-of-Grade tests in reading and math. Two years of student test scores from 307 teachers in three North Carolina public schools districts were included in the analyses. The researchers found no significant differences between NBPTS-certified teachers and non-NBPTS-certified teachers on any of the reading or math variables.

Research on the Impact of National Board Certification on Classroom and Professional Practices

Research has consistently found that National Board Certification has a positive impact on teaching practice, morale, and participation in professional development and leadership activities. NBPTS-certified teachers also appear to have a higher sense of teaching efficacy, or the belief that they can affect student achievement. Several pertinent studies are summarized below.

- Bond, Smith, Baker, and Hattie (2000) developed 13 measures of prototypic characteristics of expert teachers through a meta-analysis of the research. Prototypic features hypothesized to be held by expert teachers included better use of knowledge; better problem solving strategies; better adaptation and modification of goals for diverse learners; better decision making; more challenging objectives; and better classroom climate. The researchers compared 65 North Carolina teachers (31 who had earned National Board Certification and 34 who had not earned certification) on the extent to which they exhibited the 13 characteristics of expert teachers. Evidence was obtained from a variety of sources: teachers' instructional objectives and lesson plans; classroom observations; scripted interviews with teachers and their students; and student products. Bond and colleagues found that the NBPTS-certified teachers, compared to those who had not earned certification, excelled on all of the prototypical features, with significance found in 11 of the 13 comparisons. The two dimensions that failed to discriminate between NBPTS-certified and non-NBPTS-certified teachers were teachers' skillfulness in monitoring and providing feedback to their students and proficiency in appreciating and responding to the multidimensional complexity of classrooms.

It should be noted that some researchers have criticized the methodology used in Bond and colleagues' study. The measures of student performance have been described as "vague." Furthermore, no controls for students' previous achievement levels or demographic characteristics were included in the study design. The failure to control for other factors that could have influenced student outcomes may have biased findings in favor of NBPTS-certified teachers if higher-achieving students were assigned to these teachers or if they were the most effective teachers for other unmeasured reasons (Smith et al., 2005; Vandevort et al., 2004; Cavalluzzo, 2004).

- O'Sullivan and colleagues (2005) surveyed a random sample of NBPTS-certified teachers and a comparable sample of non-NBPTS-certified teachers from North Carolina school districts. A subsample of this group was selected for more intense study, including site visits, interviews, and collection of classroom assessments. One hundred eighty-three teachers returned the survey (a 52.4 percent response rate) and 45 pairs of teachers were selected for site visits. Results indicated that NBPTS-certified teachers were more proficient at classroom assessment than non-NBPTS-certified teachers, with classroom assessments received from NBPTS-certified teachers earning significantly higher ratings than those of non-NBPTS-certified teachers. NBPTS-certified teachers also rated themselves as having a better understanding of classroom assessment.
- A nationwide survey commissioned by the NBPTS in 2001 found that NBPTS-certified teachers reported a greater sense of teaching efficacy than other teachers. Eighty-nine percent of the respondents reported that the certification process had enabled them to create stronger curricula and more effectively evaluate student learning. Almost all survey respondents (99 percent) reported that since their certification, they had become involved in at least one leadership role aimed at improved teacher quality or student achievement. The majority (83 percent) of respondents reported that they mentored struggling, new, or future teachers, while 90 percent reported that they mentored National Board candidates (National Board for Professional Teaching Standards, 2007).
- Whitman (2002) surveyed approximately 2,000 NBPTS-certified and non-NBPTS-certified teachers nationwide and found that NBPTS-certified teachers were more likely to believe that students

could be taught successfully, regardless of their home situations or other external factors. Based on the survey responses, Whitman concluded that NBPTS-certified teachers had a greater sense of responsibility for their classrooms, greater commitment to their careers, and greater professionalism and collegiality than non-NBPTS-certified teachers.

- Ralph (2003) surveyed 239 NBPTS-certified teachers in the state of Florida to determine their views of the certification process and its effect on the professional culture of their schools. He found that the majority of NBPTS-certified teachers viewed all of the National Board Certification activities as “very” or “somewhat” important. The NBPTS-certified teachers also reported a greater desire for leadership activities than their non-NBPTS-certified peers.
- The Indiana Professional Standards Board (2002) surveyed NBPTS-certified teachers and found that they believed the certification process had made them more effective teachers. A majority (62.5 percent) reported that the greatest benefit of National Board Certification was the increase in the number of professional opportunities made available to them.
- Petty (2002) surveyed NBPTS-certified and non-NBPTS-certified North Carolina high school math teachers and found several similarities between the two groups. For example, both groups expressed a need for administrative support to obtain adequate materials, salary increases, and smaller class sizes. The NBPTS-certified teachers, however, were more likely to report that they sought opportunities for leadership roles and that they perceived their work to be an integral part of their lives. Significantly more NBPTS-certified teachers reported being very satisfied with their jobs (82 percent) than non-NBPTS-certified teachers (68 percent).
- O’Connor (2003) surveyed third through fifth grade NBPTS-certified and non-NBPTS-certified teachers in North Carolina. NBPTS-certified teachers reported being more likely to seek opportunities for leadership than non-NBPTS-certified teachers. They also viewed autonomy as more important and reported that they needed time for individual study more frequently than non-NBPTS-certified teachers.
- In Chicago Public Schools, 50 percent of NBPTS-certified teachers reported holding leadership positions in their schools, compared to 32 percent of other teachers (National Board for Professional Teaching Standards, 2009).
- One study that reported less positive results was conducted by McColskey and colleagues (2005). The researchers used interviews, surveys, classroom observations, and collection of artifacts to compare NBPTS-certified and non-NBPTS-certified teachers in fourth and fifth grade North Carolina classrooms. They found no difference between teachers in terms of the cognitive demand of their questioning, classroom management strategies used, or the number of disruptions or disengaged students in their classrooms. NBPTS-certified teachers received significantly higher ratings in the cognitive challenge of their typical assignments than non-NBPTS-certified teachers, but no other significant differences on other ratings of the quality of typical assignments were found.

Research on the Impact of National Board Certification on Teacher Retention Rates

Studies on the impact of National Board Certification on teacher retention rates have found that NBPTS-certified teachers tend to stay in the teaching profession at higher rates than other teachers; however, National Board Certification may lead to increased mobility within the profession.

The National Board for Professional Teaching Standards (2009; 2007) reported that NBPTS-certified teachers tend to remain in the teaching profession longer than the general teaching population. Hakel, Koenig, and Elliott (2008) also found that NBPTS-certified teachers nationwide stayed in teaching at

higher rates than other teachers. However, their study could not ascertain whether the certification process caused teachers to stay in the field longer or whether the teachers who chose to become certified were already more likely to remain in the field.

Goldhaber and Hansen (2007) studied the retention rates of NBPTS-certified and non-NBPTS-certified North Carolina teachers. They found that National Board Certification was correlated with increased mobility of teachers within the profession, regardless of teachers' ethnicity or experience level. The researchers hypothesized that as a consequence of receiving National Board Certification, teachers may have been able to secure more favorable teaching assignments and thus transferred to higher-achieving, higher-income, and lower-minority schools. Goldhaber and Hansen suggested that, based on these findings, state and local policymakers consider providing differential financial incentives to encourage NBPTS-certified teachers to work in disadvantaged schools.

Unequal Distribution of National Board Certified Teachers

There is ample evidence that NBPTS-certified teachers are not equally distributed among the nation's schools and students. Researchers have consistently found that NBPTS-certified teachers are more likely to work in schools with fewer low-income, minority, and low-performing students (Harris & Sass, 2008; Humphrey et al., 2004). Clotfelter, Ladd, and Vigdor (2007) found that students in classrooms served by NBPTS-certified teachers also tended to have fewer minority students and fewer students who were more advantaged in terms of their income level, parents' education level, and average prior year test scores.

Humphrey, Koppich, and Hough (2004) conducted a study of NBPTS-certified teacher assignments by school type in the six states with the largest number of NBPTS-certified teachers: California, Florida, Mississippi, North Carolina, Ohio, and South Carolina. They found that NBPTS-certified teachers were not well-represented in high-need schools. For example, only 12 percent of NBPTS-certified teachers taught in low-income schools; 16 percent taught in high-minority schools; and 19 percent taught in low-performing schools.

Harris and Sass' (2008) study of Florida math teachers found that NBPTS-certified teachers tended to be more experienced and more likely to have earned an advanced degree than their peers who did not obtain certification. Florida teachers who had or later became NBPTS-certified were also more likely to have smaller proportions of Black students in their classes (16 percent) than teachers who never became certified (22 percent) and fewer students receiving free or reduced price lunch (30 percent for NBPTS-certified teachers versus 42 percent for non-NBPTS-certified teachers).

In contrast to these findings, a National Board for Professional Teaching Standards (2009) publication reported that high numbers of NBPTS-certified teachers in the Chicago Public Schools were working in high-need schools: 60 percent of schools with NBPTS-certified teachers had at least 85 percent low-income enrollment and 85 percent of NBPTS-certified teachers worked in schools with at least an 85 percent minority student population.

Bundy (2006) obtained composite test scores for the 2003-04 school year from North Carolina's state assessment. North Carolina's public schools were divided into quartiles (none, low, medium, and high), based on the percentage of NBPTS-certified teachers in the school faculty. Results indicated that NBPTS-certified teachers had a positive school-wide effect over and above student ethnic composition and income level. National Board certification had a greater effect on student achievement than the percentage of teachers with advanced degrees, suggesting that National Board Certification was a better indicator of teaching success than attainment of a master's or doctoral degree. The ratio of NBPTS-certified teachers in classrooms was a significant predictor of student performance; however, the effect was modest. An increase in the ratio of NBPTS-certified teachers of 10 percent in a school

was estimated to result in an achievement test score increase of less than one point on a 100-point scale.

A second set of analyses conducted by Bundy (2006) found that school-wide performance continued to increase as more NBPTS-certified teachers were added to the school faculty. There was no significant difference between student performance at schools without NBPTS-certified teachers and those with low percentages of NBPTS-certified teachers. However, a significant difference was found between the performance of schools without NBPTS-certified teachers and those with medium and high levels of NBPTS-certified teachers. Additionally, there was a significant difference between student achievement in the medium and high groups, confirming that student performance gains continued to increase as additional NBPTS-certified teachers were added to the faculty. Based on these findings, Bundy suggested that schools need to achieve a teaching staff composed of 3.6 percent to 7.4 percent of NBPTS-certified teachers in order to see a significant improvement in student performance. He also noted that the results of his study should be interpreted with caution due to the greater than average distribution of NBPTS-certified teachers in high-performing schools and the tendency to assign higher-performing students to more effective teachers.

On a related note, one of the biggest concerns about the National Board relates to the fact that minority candidates have lower passing rates than White teachers on the organization's assessment. Black and Hispanic teachers enter the NBPTS candidacy pool in numbers proportional to their representation in the U.S. teaching force, but they earn certification at much lower rates. Passing rates for Black candidates have been found to be as low as 13 percent (National Board for Professional Teaching Standards, 2007; Humphrey et al., 2004; Archer, 2002).

On a Local Note

Until recently, both federal and state funds were available to subsidize the \$2,500 NBPTS assessment fee for Florida teachers. However, the state-funded fee subsidy was eliminated by the Florida Legislature in their special session during the fall of 2008. Only federal funds allocated to the state of Florida are now available for new candidates. These limited funds are allocated to each school district based on its teacher population and are assigned only to those teaching in high needs/low-performing schools within their districts. Eligible candidates are considered for the funding on a first-come basis and receive a fee subsidy equal to 50 percent (\$1,250) of the NBPTS assessment fee. Candidates are responsible for paying all remaining fees (Sawchuk, 2010; Florida Department of Education, 2009).

Until 2008, Florida legislation also offered two separate bonuses: a National Board Certification bonus and a mentoring bonus. The certification bonus gave teachers a 10 percent raise for holding NBPTS certification and the mentoring bonus offered an additional 10 percent bonus for teachers who performed 12 days of mentoring and related services to other public school teachers. Now, both bonuses are prorated based on budget availability, with a priority on the certification bonus, and the bonus eligibility period has been limited to 10 years for initial certification only (Sawchuk, 2010; Florida Department of Education, 2009).

As of 2009, Miami-Dade County Public Schools (M-DCPS) had 1,357 NBPTS-certified teachers. The District offers the following incentives:

- 120 Master Plan Points applicable toward Florida Teaching Certificate Renewal are awarded for completion of the entire process, whether or not certification is achieved.
- Certified teachers may renew areas of certification on the Florida Educator's Certificate which correspond to the National Board Certification area, using the National Board Certificate in lieu of Master Plan Points.

- M-DCPS pays its employees that achieve certification a one-time stipend of \$7,500.

More information on M-DCPS and National Board Certification can be found on the District's Office of Professional Development Web site (<http://prodev.dadeschools.net/nbpts/nbpts.asp>). The Web site provides resources for National Board candidates, potential candidates, and certified teachers. Information available on the Web site includes a list of trained candidate support providers, application instructions and forms, an information meeting schedule, and links to the National Board for Professional Teaching Standards, Florida Department of Education, and National Board Certified Teachers of Miami-Dade, Inc.

The following studies suggest that M-DCPS' NBPTS-certified teachers have had a small but positive effect on students' academic achievement and a positive impact on the classroom environment. They also indicate that M-DCPS' NBPTS-certified teachers are more likely to teach advantaged students and work in schools with better attendance records and fewer incidents of violence and crime. However, M-DCPS' NBPTS-certified teachers appear to be more equally distributed throughout the district's schools than has been the case nationwide, where most NBPTS-certified teachers work in higher-performing, higher-income, and lower-minority schools.

- Cavalluzzo (2004) found that M-DCPS students assigned to NBPTS-certified math teachers had larger gains on end-of-year math exams from 2001 to 2003 than students assigned to non-NBPTS-certified teachers. Data were obtained for NBPTS-certified teachers instructing 3,049 students; NBPTS applicants instructing 4,749 students; and 1,409 students with teachers who had either failed certification or had withdrawn from the process. Teacher characteristics included in the analyses were experience level; selectivity of undergraduate school; attainment of an advanced degree; possession of state certification in mathematics; teaching position (math versus another primary job assignment); and attainment of National Board Certification. With the exception of undergraduate school quality, each of the teacher quality indicators made a significant contribution to student outcomes. When compared with students whose teachers had not been involved with the National Board, Cavalluzzo found that students with otherwise similar teachers made larger gains if their teacher was NBPTS-certified and smaller gains if their teacher failed or withdrew from the National Board Certification process. She concluded that her study's findings strongly supported the view that National Board Certification succeeded in identifying highly effective teachers.

The reader should note that, upon closer inspection, one finds a very small positive effect which would be equivalent, for the average student, to a difference of approximately one or two percentile points (Effect Size = 0.07 to 0.08, or 7 to 8 percent of one standard deviation) in favor of students taught by NBPTS-certified teachers. The fact that this finding was statistically significant should not imply high importance since the large sample size used in the study contributed to making such a small effect statistically significant. It can be argued that the size of the difference between NBPTS-certified and non-NBPTS-certified teachers may have been statistically significant, but not in a manner that makes a practical difference in the real world.

Cavalluzzo (2004) examined whether the benefits associated with having a NBPTS-certified teacher varied across M-DCPS student sub-populations. She found that NBPTS-certified teachers had a greater impact on Black and Hispanic students' achievement than they had on the achievement of students of other ethnicities. Students eligible for free or reduced price lunch benefitted about as much as other students having a NBPTS-certified teacher, while gifted students made smaller gains than other students with NBPTS-certified teachers.

Cavalluzzo (2004) also found that M-DCPS students with NBPTS-certified teachers were more likely to be White or Hispanic and less likely to be Black. Students of NBPTS-certified teachers

were more likely to be considered gifted, have higher grade point averages, and have fewer absences. They were less likely to be eligible for free or reduced price lunch, have had an out-of-school suspension during the school year, or repeat their current grade level. In general, students with NBPTS-certified math teachers tended to have teachers with more experience and higher levels of education. Students with NBPTS-certified teachers attended schools that were similar to other schools in their enrollment levels, share of administrators to total school staff, spending per student, and level of student mobility, but schools with NBPTS-certified teachers had better attendance records and fewer incidents of crime or violence.

- Holding (2006) compared the perceptions and attitudes of M-DCPS eighth and tenth grade students assigned to NBPTS-certified and non-NBPTS-certified science teachers. The study took place in 12 of the district's middle and senior high schools, with a total sample of 927 science students. Participating students were chosen based on their teachers' willingness to make their classes available. Each NBPTS-certified teacher who agreed to participate was asked to recruit a non-NBPTS-certified teacher who taught the same science course at the same school; had been teaching for approximately the same number of years; and was assigned students with similar demographic characteristics. The What is Happening in Class (WIHIC) questionnaire was administered to determine students' perceptions of seven dimensions of the classroom environment. Significant differences between students taught by NBPTS-certified teachers and those taught by non-NBPTS-certified teachers were found for five of the seven WIHIC scales: Teacher Support, Involvement, Task Orientation, Investigation, and Cooperation. Differences between the two groups of students were not significant for the WIHIC scales of Student Cohesiveness and Equity. (Examples of items comprising the Student Cohesiveness scale include "Members of the class are my friends" and "I know other students in this class." Examples of items comprising the Equity scale include "I am treated the same as other students in this class" and "The teacher gives as much attention to my questions as to other students' questions.") Holding concluded: "Overall, these results tentatively suggest that National Board Certified science teachers are more effective than non-National Board Certified science teachers in providing more teacher support to their students and creating a learning environment in which the students have more opportunities to become involved, carry out investigations, and work cooperatively."

Holding (2006) also administered the Test of Science-Related Attitudes to participating students. Students of NBPTS-certified teachers reported more favorable attitudes toward science than students of non-NBPTS-certified teachers.

The reader should note important limitations to Holding's findings. The way in which teachers were recruited to participate in the study (i.e., voluntary participation instead of random selection and the method used to select the matched comparison group of non-NBPTS-certified teachers) may have introduced bias into the sample. Furthermore, no efforts were made to control for differences between students assigned to NBPTS-certified and non-NBPTS-certified teachers. Other variables, such as the type of school students attended, type of science course in which students were enrolled, and characteristics of students in the class, may have influenced students' scores on the outcome measures.

- As part of Humphrey, Koppich, and Hough's (2004) analysis of NBPTS-certified teacher assignments by school type in six states, the researchers conducted a supplementary analysis within M-DCPS and the Los Angeles Unified School District (LAUSD). They found that both school districts had significant percentages of NBPTS-certified teachers working in low-performing schools, although NBPTS-certified teachers were better represented in LAUSD's low-performing schools. In M-DCPS, 52 percent of all teachers in the district worked in low-performing schools; 40 percent of NBPTS-certified teachers worked in low-performing schools. In LAUSD, 65 percent of all teachers in the district worked in low-performing schools; 60 percent of NBPTS-certified teachers worked in

low-performing schools. These figures indicated that the two districts had much higher proportions of NBPTS-certified teachers working in low-performing schools than the six-state average of 19 percent found in their main analysis.

All reports distributed by Research Services can be accessed at <http://drs.dadeschools.net>.

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