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ABSTRACT

This study examined the relationship between personality characteristics and National Board Certification among teachers who had achieved National Board Certification, teachers who were in the process of completing the requirements for National Board Certification, and teachers who had not attempted National Board Certification. It identified adult personality characteristics as measured by the fifth edition of Cattell's 16 PF Questionnaire. The questionnaire examined five global factors: extraversion, anxiety, tough-mindedness, independence, and self-control and measured 16 primary personality factors (e.g., warmth, reasoning, emotional stability, dominance, sensitivity, apprehension, perfectionism, and tension). Participants were 201 south Mississippi teachers who fell into one of the three groups. Teachers in the groups who were certified or who were seeking certification had received training from the Gulf Coast Master Teacher Mentoring Project, which focused on analytical and reflective thinking and writing. Results indicated that teachers who were National Board Certified or were seeking National Board Certification were stronger in the area of abstract and analytical conceptual reasoning than were teachers who had not taken part in National Board Certification training. Most of those achieving or seeking certification did so for reasons of professional achievement and professional growth. (Contains 80 references.) (SM)

The University of Southern Mississippi

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN TEACHER
PERSONALITY AND NATIONAL BOARD CERTIFICATION
AMONG SOUTH MISSISSIPPI TEACHERS

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The University of Southern Mississippi Gulf Coast

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INTRODUCTION

Today's schools reflect the problems of society, and teachers are faced with problems that seem more intractable than ever before (Ayers, 1993). Even though teachers of today are faced with society's problems, they also are under demands from the public to be accountable for achieving results with the financial resources that the community provides for public education. Within the profession itself there are factions which debate the merits of pedagogy versus content knowledge (Gage, 1978). The increased demand for effective teaching practice has caused debate among educators and spurred an effort on the part of educators to identify the common characteristics of accomplished teachers.

The demand for increased accountability requires that teachers know not only their subject matter but also the pedagogy necessary to effectively teach it to children. In response to this demand, the National Board for Professional Teaching Standards was created in 1987 (National Board for Professional Teaching Standards, 2000c).

During the last 11 years the National Board for Professional Teaching Standards has developed and administered a performance-based assessment for the purpose of identifying and promoting accomplished teaching. The first assessments took place during the 1993-1994 school year in the areas of Early Adolescence Language Arts and Early Adolescence Generalist. Currently, there are assessments in 19 subject areas with plans to provide assessments in 30 different subject areas. The current 19 assessments make the National Board process available for 87% of teaching areas.

Interest in National Board Certification has increased dramatically. In 1994, the National Board reported the first 86 National Board Certified Teachers. Two of these

teachers were from Mississippi. In November 2000, the National Board reported 4,694 new board certified teachers bringing the total number of National Board Certified Teachers in the nation to 9,498; 755 of these teachers are from Mississippi (National Board for Professional Teaching Standards, 2000a).

Increased recognition and interest in the National Board Certification process created a demand for validation of the process and its effect on student learning. In response to this demand, Lloyd Bond and a group of researchers at the University of North Carolina conducted a study that compared National Board Certified Teachers to those who did not achieve certification on 13 dimensions of teaching expertise. This study showed that National Board Certified Teachers scored higher on all 13 dimensions than the teachers who sought but did not achieve National Board Certification. The differences were statistically significant on 11 of the 13 dimensions. Researchers also examined samples of student work in classes taught by the National Board Certified Teachers and non-Board Certified Teachers. Nearly three-fourths (74%) of the work samples collected from the National Board Certified Teachers' students reflected a high level of comprehension of the concepts being taught compared to 3 in 10 (29%) of the work samples of students taught by non-Board Certified Teachers (National Board for Professional Teaching Standards, 2000b; Wheeler, Minichello, Jacob, & Garcia, 2000)

For the past 3 years, this researcher has directed a project in south Mississippi at The University of Southern Mississippi Gulf Coast campus which has as its purpose providing support and aid for teachers pursuing National Board Certification. As the researcher worked with teachers who were striving to become National Board Certified, the researcher began to notice common teaching behaviors in the accomplished teachers.

Her work with teachers pursuing National Board Certification led the author to become interested in investigating common personality characteristics among accomplished teachers.

The present study focused on the adult personality characteristics of three groups of teachers and the relationship of these personality characteristics to National Board Certification. Chapter I provides an introduction, purposes of the study, research hypotheses, definition of terms, delimitations, assumptions, and justification for the study. Chapter II provides a review of literature related to effective teaching, adult personality factors, and National Board Certification. Chapter III explains the methodology that was used and includes participant selection, instrumentation, procedures, limitations, and data analysis procedures. Chapter IV presents the results of the analysis of data. Finally, Chapter V presents an interpretative summary of the findings and recommendations for further study.

Purpose of the Study

The purpose of this study was to examine the relationship between personality characteristics and three groups of teachers. The study examined the personality characteristics of teachers who had achieved National Board Certification, teachers who were in the process of completing the requirements for National Board Certification, and teachers who had not attempted National Board Certification. The study identified adult personality characteristics as measured by the fifth edition of Cattell's 16 PF Questionnaire (16 PF) using data provided by teachers from each of the three groups surveyed. Since the participating teachers were from the geographic region served by the researcher, the goal of the study was to provide information that the researcher and other

educators can use for teacher preparation and professional development for career teachers.

Specific purposes included the following:

1. To establish a profile of adult personality factors on a group of National Board Certified Teachers.
2. To establish a profile of adult personality factors on a group of south Mississippi teachers currently seeking National Board Certification.
3. To establish a profile of adult personality factors on a group of south Mississippi teachers who have not yet chosen to pursue National Board Certification.
4. To establish a profile of adult personality factors on teachers who teach the same subject and age.
5. To compare the personality factors of the three groups of teachers to determine what relationship exists among the three groups and their adult personality styles.

Research Hypotheses

This study considered the following null hypotheses:

H₁: There is not a significant difference between the personality factors of south Mississippi National Board Certified Teachers and teachers seeking National Board Certification.

H₂: There is not a significant difference between the personality factors of south Mississippi National Board Certified Teachers and south Mississippi teachers who have chosen not to pursue National Board Certification.

H₁: There is not a significant difference between personality factors of south Mississippi teachers seeking National Board Certification and south Mississippi teachers who have chosen not to pursue National Board Certification.

Definition of Terms

National Board Certification - A voluntary national certification based on a performance assessment which requires the teacher to complete a portfolio that addresses specific questions and showcases his or her teaching. Teachers also complete a one-day subject matter test. Nationally, 49% of those teachers who have attempted National Board Certification have been successful. National Board Certification is a symbol of professional teaching excellence. National Board Certification means that a teacher has been judged by his or her peers as one who is accomplished, makes sound professional judgments about student learning, and acts effectively on those judgments (National Board for Professional Teaching Standards, 2000c).

Five Core Propositions - The National Board for Professional Teaching Standards established five criteria for accomplished teaching. These five criteria are the basis for the subject-specific standards documents for each field. The following are these criteria:

1. Teachers are committed to students and their learning.
2. Teachers know the subjects they teach and how to teach those subjects to students.
3. Teachers are responsible for managing and monitoring student learning.
4. Teachers think systematically about their practice and learn from experience.

5. Teachers are members of learning communities. (National Board for Professional Teaching Standards, 2000c, p. 3)

Mentoring Groups - Small, subject-specific groups of National Board Certification Candidates who meet together in study groups to work on the requirements for National Board Certification. These groups provide a forum for teachers to collaborate with other teachers and share their teaching expertise.

National Board Certification Area - Using the five core propositions as a basis for teaching expertise, the National Board established subject matter and age-specific certificates for teachers. Currently, there are certificates available in 19 areas, and the board has outlined a plan for establishing 30 subject and grade-specific certificates (National Board for Professional Teaching Standards, 2000c).

Primary Personality Factors - A set of 16 adjectives which Dr. Cattell and his colleagues developed to identify the primary personality traits which explain the entire personality domain. The 16 primary personality factors used were Warmth, Reasoning, Emotional Stability, Dominance, Liveliness, Rule-Consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privatness, Apprehension, Openness to Change, Self-Reliance, Perfectionism, and Tension (Russell & Karol, 1994; Vansickle & Conn, 1996)

Global Personality Factors - Five adjectives used to describe personality. Combining similar primary personality factors, Cattell identified the global factors as Extraversion, Anxiety, Tough-Mindedness, Independence, and Self-Control (Russell & Karol, 1994; Vansickle & Conn, 1996) (see Appendix A).

Teacher - A professional educator who works with students in grades kindergarten through 12.

South Mississippi Teachers - Teachers who teach in the Mississippi counties of George, Jackson, Stone, Harrison, Pearl River, or Hancock.

Delimitations

This study was conducted using the following delimitations:

1. The study was delimited to a pool of south Mississippi National Board Certified Teachers who participated in the Gulf Coast Master Teacher Mentoring Project.
2. The study was delimited to a pool of south Mississippi teachers who were currently in the process of seeking National Board Certification and were active members of the Gulf Coast Master Teacher Mentoring Project.
3. The study was delimited to a pool of south Mississippi teachers who had not chosen to pursue National Board Certification and who taught in George, Stone, Jackson, Pearl River, Hancock, or Harrison county.
4. Adult personality factor data were obtained from administering the fifth edition of Cattell's 16 PF Inventory.
5. All variables and/or participants not specified were considered beyond the scope of this study.

Assumptions

For the purposes of the present study, the following assumptions were made:

1. The teachers involved in the present study provided true and accurate information.

2. National Board Certification identifies accomplished teaching practice.
3. The three samples of teachers—those who achieved National Board Certification, those currently pursuing National Board Certification, and those who have not yet chosen to pursue National Board Certification—represented the general population of teachers in south Mississippi. Since the National Board Certified Teacher sample and the sample of teachers pursuing National Board Certification were composed of public school teachers, only teachers from the public schools were chosen for the random sample.

Justification for the Study

Although there were no immediate benefits to participants, there were longitudinal benefits. This study did not prove that National Board Certification affects the personality of teachers who attempt it. However, the study found a relationship between National Board Certification and the personality trait of reasoning and may serve as a basis for conducting further research in this area. Information on the personality of effective teachers may be beneficial to schools of education and school systems as they seek to improve the teaching performance of teachers. The information from this study and others like it may serve to help educational institutions work with preservice and veteran teachers as they seek to enhance these personality traits.

The Gulf Coast Master Teacher Mentoring Project and the Gulf Coast Education Initiative Consortium seek to aid teachers in the area of professional development. The results of this survey may help the mentoring project identify personality characteristics

common among National Board Certified Teachers. This information may be used to plan training for inservice and preservice teachers.

REVIEW OF RELATED LITERATURE

In every child who is born, under no matter what the circumstances, and no matter what parents, the potentiality of the human race is born again; and in him, too, once more, and of each of us, our terrific responsibility toward human life; toward the utmost ideals of goodness, of the horror of terror, and of God.

(James Agee, cited in Brown & Spizman, 1996, p. 56)

Effective Teachers

Researchers during the 1970s discovered that teachers and schools had substantial effects on students' achievement levels (Demmon-Berger, 1986). Teachers were viewed as either weak links to be circumvented in the educational process or as technicians to be programmed (Porter & Brophy, 1988). New studies of the "scientific basis of teaching" led many teacher education programs to develop systems for evaluating prospective teachers according to scientific objectives and stated performance criteria (Cochran-Smith, 2000, p. 32). This view of effective teaching was used to develop instruction criteria which outlined each step the teacher employed. This method, called "direct," "explicit," and "active" teaching, focused on teaching material to the whole class as a group and is used by some teachers today (Sikorski, Niemiec, & Walberg, 1994, p. 50).

The debate as to whether teaching is an art or a science has not yet been resolved. Gage (1978) defined teaching as any activity on the part of one person intended to facilitate learning on the part of another. According to Gage, teaching as an art was a

process that called for intuition, creativity, improvisation, and expressiveness and left room for departures from rules or formulas (Gage, 1978).

The demand for educational accountability of the 1980s focused attention on the need for accomplished teachers and a demand for identifying those qualities that contribute to teaching effectiveness. The effective schools movement recognized that creating teachers prepared to assume the duties and responsibilities necessary to redesign schools for the future was the key to successful schools (Porter & Brophy, 1988). Public concern about the quality of teaching and teacher education prompted questions about what teachers should know and be able to do. The knowledge question evolved into the question of what effective teachers should know and how they constructed new knowledge appropriate for differing local contexts and for diverse learners (Cochran-Smith, 2000). Research showed that teacher knowledge encompassed understanding the content to be taught, knowledge about pedagogical strategies for teaching said content, and awareness of student background knowledge and misconceptions. Teachers who accepted responsibility for student outcomes were more effective than teachers who saw their students as solely responsible for their learning. Good teachers used published instructional materials to contribute to instructional quality; however, good teachers adapted instruction to the needs of their students rather than following fixed scripts. Teaching became recognized as a complex process that contained many points for possible error (Porter & Brophy, 1988). The 1980's reform movement recognized that school improvement required knowledgeable teachers with greater responsibility and authority for decision making. This directly opposed the 1970's bureaucratic model of

accountability which used the standard of compliance to hold teachers accountable for following standard operating procedures (Darling-Hammond, 1988).

In a summary of research observations on effective teaching techniques and characteristics, Demmon-Berger (1986) identified the following 15 characteristics and strategies found among effective teachers. Effective teachers (a) tended to be good managers, (b) used systematic instruction techniques, (c) had high expectations of students and themselves, (d) believed in their own efficacy, (e) varied teaching strategies, (f) handled discipline through prevention, (g) were caring, (h) were democratic in their approach, (i) were task oriented, (j) were concerned with perceptual meanings rather than facts and events, (k) were comfortable interacting with others, (l) had a strong grasp of subject matter, (m) were accessible to students outside of class, (n) tailored teaching to student needs, and (o) were flexible and imaginative (Demmon-Berger, 1986).

Parents have indicated their concern with teacher effectiveness. Parent-teacher communication was one of their concerns. Rich (1998) identified the following three parental concerns: how well teachers knew and cared about teaching, about their children, and about communicating with parents (Rich, 1998).

Teaching contains many variables that can affect whether or not a child learns. Ornstein (1987) advanced the theory that teacher effectiveness research often ignored the variables of student social-economic status, cognitive ability, psychological characteristics, grade level, and subject area. Failure to consider these variables resulted in distorted research findings (Ornstein, 1987).

Coladarci (1988) defined the term *Master teacher* as one who demonstrates an excellence in their professional role beyond mere competence. *Effective teachers* were

defined as teachers who were able to facilitate student growth within existing constraints. Thus, Coladarci argued, all teachers should be expected to be effective. Effective teaching is an undemanding criterion for identifying Master teachers (Coladarci, 1988). Doyle (1985) differentiated the concept of effective teaching from Master teacher when he defined effective teaching as consisting of the constructive adaptation of social and curricular structures to specific contexts (Doyle, 1985).

Silcock (1993) argued that the learner was the determining factor in the learning process. Effective teachers were those who provided students with maximum opportunity to learn. Effective teachers made learning possible, but the success of their efforts depended on what the learner decided to do. Effectiveness depended as much on the independent actions and responsibilities of the learner as on the behavior of the teacher. The art lay in tailoring the method to ensure engagement with task (Silcock, 1993). Porter and Brophy (1988) recognized teaching as a complex process where teachers were constantly monitoring their students and making adaptations in their teaching strategies rather than adopting some routine procedure.

Effective teaching contained many components. Effective teachers reflected on the feedback they got regarding the results of their instruction (Norton, 1997). In a study of preservice teachers, Norton (1997) found that novice teachers believed reflective practice to be an important component in developing effective teaching practice. Novice teachers defined an effective practitioner as a caring, committed, highly creative, proficient reflective thinker with a strong internal locus of control (Norton, 1997). Bear (1998) found that the style of effective teachers combined three strategies including an

authoritative style, positive climate strategies, and utilization of problem-solving strategies in achieving self-discipline among students.

Teacher knowledge was represented as including knowledge about the content to be taught, pedagogical strategies, and students and their background knowledge. The goals that teachers held for schooling and the responsibilities they were willing to accept influenced the classroom practice of effective teachers. Effective teachers accepted responsibility for student outcomes and communicated to their students what was expected and why. Teachers promoted learning by helping their students develop strategies for monitoring and improving their own learning (Porter & Brophy, 1988). Wray, Medwell, Fox, and Poulson (2000) found that effective teachers were those who provided students with maximum opportunity to learn. These teachers demanded task engagement, prepared well, and matched tasks to the abilities of children.

Morin and Welsh (1991) used a 10-item Likert-type scale comprised of five major categories based on the National Board for Professional Teaching Standards' five core propositions to compare their perception of self-efficacy between preservice and practicing teachers. This study defined self-efficacy as an individual's perception of how effectively one performed specific behaviors. This theory suggested that teachers who had a high measure of self-efficacy were more likely to engage in activities to promote their development of competencies. Both preservice and practicing teachers ranked knowledge of students and their learning as most important and membership in the learning community as least important (Morin & Welsh, 1991).

The major question during the 21st century focused on the outcomes, consequences, and results of teacher education. The focus began with the ultimate goal of

student learning (Cochran-Smith, 2000). Olson and Wyett (2000) proposed that this current focus tended to overemphasize the cognitive domain and failed to focus on the affective domain. Olson and Wyett proposed that the personality and attitudes of teachers were just as important as their knowledge of subject matter and pedagogical skills, which research showed directly impact student learning (Olson & Wyett, 2000).

High expectations for student accomplishment were seen as a hallmark of effective teaching. Pearl and Campbell (1999) suggested that teachers who expected less of students might subtly communicate a sense of inadequacy to students. Race and attractiveness were factors identified as affecting teacher judgment (Brophy, 1998; Pearl & Campbell, 1999). Brophy (1998) found that effective teachers appeared to place greater emphasis on insisting on better effort from students and to have greater confidence in the improvements students can achieve over time.

Danielson (1996) divided teaching responsibilities into four separate but related domains—planning and preparation, the classroom environment, instruction, and professional responsibilities. These domains were the basis for the praxis teaching assessment (Danielson, 1996).

Haycock (1998) reported on three studies that investigated the influence of teacher quality on student achievement. A Tennessee study on the effect of teachers on student achievement, as measured by standardized tests, found that students of the least effective teachers gained 14 percentile points during the school year while students of the most effective teachers gained 53 percentile points. This study also found evidence that the effects of teachers were long-lived, both for those who advanced student achievement and those who squashed it. A similar study conducted by the Dallas Independent School

District measured student achievement over a 3-year period. The Dallas study found that students of highly effective fourth- to sixth-grade teachers rose from the 59th percentile to the 78th percentile by the end of the sixth grade. Scores of students in this study, who were assigned to ineffective teachers for a 3-year period, fell from the 60th percentile to the 42nd percentile. When the Boston Public Schools followed the achievement of 10th graders over a year and charted them by teacher, Boston found that although the gains of the students of the top third of teachers were slightly below average, the scores of students of teachers from the bottom third showed virtually no growth (Haycock, 1998).

Effective teachers often filled leadership roles in their schools. Wilson (1993) interviewed outstanding high school teachers nominated by their colleagues as leaders. Her research revealed four aspects of teacher leaders. Effective leaders were hard working and highly involved with curricular and instructional innovation; they demonstrated their creativity by being able to motivate students from a wide range of backgrounds and abilities; they were gregarious and made themselves available to other teachers as a resource or advocate, and they energetically sponsored extracurricular activities for young people (Wilson, 1993).

Teacher leadership, however, did not come without cost. Wilson (1993) reported that teacher leaders perceived the school culture as one that did not reward and sometimes obstructed risk-taking, collaboration, and role modeling. Administrators seemed averse to teamwork that disregarded rank-based authority (Wilson, 1993). However, teachers accepted the responsibility for their profession. Teaching was seen as a demanding process that required dedication and commitment and was one of the lowest paying professions. Still, excellent teachers remained in the profession. These teachers

recognized that teachers hold the responsibility and power for strengthening their profession. In the words of William Ayers (1993),

Young people need a thoughtful, caring adult in their lives; someone who can nurture and challenge them, who can coach and guide, understand and care about them. . . . People teach as an act of construction and reconstruction, and as a gift of oneself to others. I teach in the hope of making the world a better place. If teaching is to become vital and honorable again, it is teachers who will have to make it so. It is the voice of the teacher that must at last be heard. (p. 127)

Teaching Portfolios

Since the National Board Certification process is made up of two parts, one that requires the candidates to complete a teaching portfolio, the researcher included a discussion of teacher portfolios, their uses, advantages, and disadvantages.

Critics pointed to the time portfolios required to develop and to evaluate and the expense of training teachers in developing professional portfolios. They noted that portfolios only showed the parts of a teacher's practice that he or she chose. Teachers hesitated to include information that showed their teaching in less than a favorable light; therefore, the reflective value was eliminated. If poorly organized, portfolios became nothing more than scrapbooks.

Teachers reported that teaching portfolios provided them with vivid visual representations of themselves and provided concrete evidence of good teaching. They were a reminder that what counts was what could be demonstrated (Tice, 1994). Their varied contents provided a many dimensional representation of the teachers who prepared them. Rather than just telling about a teaching practice, they allowed teachers to actually

show what they could do (Zubizarreta, 1994). In a professional portfolio a teacher both showed and told the value of professional development and its impact on the learning of children (Bruck, 1997).

Murray (1995) found that the appeal of the teaching portfolio rested in the flexibility it provided the teacher for the portfolio to take on the character of the owner. When the control of the portfolio remained with the teachers, they were better able to compose a more complete picture of themselves and their teaching practice (Murray, 1995). Portfolios allowed teachers to express their individual strengths and unique styles (Giuliano, 1997). As they created a teaching portfolio, teachers were in charge of their own assessment; they could self-assess, self-evaluate, and self-regulate (Koehler, 1996).

Bozzone (1995) reported that portfolios were self-assessment tools for teachers, and organizing and sharing them became a collegial activity (Bozzone, 1994). Many teachers reported that meeting with peers to share work, ideas, and goals in progress was the most valuable part of the portfolio process (Morgan, 1997). Collaboration was a valued dimension of the portfolio and served to balance the teacher's subjectivity with objective criteria. Using professional collaboration to design a professional portfolio promoted collegial exchange, focused on teaching, and combated the isolation faced by classroom teachers (Zubizarreta, 1994). Teachers who developed a professional portfolio reported that the process was worthwhile because it forced them to have conversations about individual students and their learning (Wagenen & Hibbard, 1998).

Teachers reported that portfolios helped them focus on selecting strategies and methods of evaluation and made them more reflective of their practice (Tice, 1994). By allowing the individual to reflect on the real task of education—teaching—the portfolio

became a powerful self-assessment tool for the individual teacher (Murray, 1995). As a teacher created a professional portfolio, he or she had opportunity to reflect on his or her own growth as a teacher and a learner, set professional and personal goals, and to become aware of his or her journey as a professional educator (Hurst, Wilson, & Carmen, 1998). Keeping a portfolio current became a process of continually reflecting on one's teaching and provided teachers with the opportunity to reflect on what, how, and why they teach (Zubizarreta, 1994). After completing a professional portfolio, teachers reported that they learned the art of reflection, the value of collaboration, and how to organize and evaluate instruction more effectively and completely (Wagenen & Hibbard, 1998).

Portfolios are also used as a professional development tool (Tarnowski, Knutson, Gleason, Gleason, & Songer, 1998). Portfolios allowed teachers to show not only their teaching strengths but also their heart, soul, and passion for teaching (Hurst et al., 1998). Creators of portfolios learned most about themselves and their progress by looking at representative samples of all their work, both good and bad (Wagenen & Hibbard, 1998). Connections forged through professional conversations among colleagues and the rich and varied teachers' portfolios that emerged were evidence of a successful professional development program (Morgan, 1997).

Bozzone (1994) found that portfolios captured what a teacher did and gave the teacher an opportunity to reflect on its content. A teacher's portfolio also served as a model for his or her students' portfolios. New ideas gleaned from sharing and discussing the portfolio benefited both the students and the instructor. By making their portfolios available to parents during parent visits to the classroom, parent conferences or open

house, the teacher gave the parents more information about their child and helped build their confidence in him or her (Hurst et al., 1998).

Golcomb (1996) saw portfolios as powerful tools for assessment and evaluation. Connecticut teachers and administrators developed portfolios which substituted for formal observation and evaluation. A reflective journal helped focus the teacher's attention on the portfolio's goal, guided him or her in reflecting on his or her collection of artifacts, encouraged monthly meetings with collaborators, and promoted frequent self-evaluation and self-regulation (Wagenen & Hibbard, 1998). Portfolios served the needs of instructors interested in professional development and of administrators seeking more reliable means of evaluating teaching performance (Zubizarreta, 1994).

Although portfolios could be powerful professional tools for teachers, there were several disadvantages to their use. One concern was that developing a portfolio took a great deal of time, and this could be a problem for already overworked teachers (Murray, 1995). Collecting artifacts, which represented teaching philosophy and practice, reflecting on teaching practice, writing about teaching and organizing materials into an acceptable format, required a large expenditure of time and effort on the part of the teacher. Time was also required for the training of teachers in various aspects of portfolio development and assessment; however, providing training for both teachers and for portfolio raters made the judgment of portfolios more valid and reliable (Murray, 1995). Schools interested in implementing collegial supervision involved teachers in the initial planning activities. Collegial activities in supervision were linked with inservice teacher training themes and subsequent teacher evaluation procedures (Koehler, 1996). Collaboration was the key to successful portfolio development, but successful

collaboration required time for teacher interaction, time for teachers to plan the collaborative training, and time for training in successful collaboration techniques (Wagenen & Hibbard, 1998).

A second possible disadvantage to portfolio development was a lack of structure and focus in the organization of the portfolio. A broad body of evidence was needed to represent a teacher's practice. Standards and performance assessment were part of an interconnected process (Lyons, 1996). In Connecticut, when teachers first used portfolios as a professional development tool, they collected too many artifacts, did not meet often enough to talk about what they were doing and why, and did not think about how to deal with large numbers of artifacts. Their work lacked focus; their reflections were flat and mechanical and discussed what they had done, not what they had learned or planned to do next. Their first two efforts at portfolios were overwhelming because they lacked direction (Wagenen & Hibbard, 1998). Only when teachers chose a focus and built their portfolios around the focus did the portfolio become a useful tool for professional development. A well-defined format aided in the development of a teaching portfolio. The format presented the materials in a way that allowed an administrator or supervisor to maneuver easily through the portfolio (Tarnowski et al., 1998). A portfolio became too burdensome for people to read and nothing more than a bulky scrapbook if teachers were not selective about what they included (Hurst et al. 1998).

One disadvantage of portfolios was the possible misuse of the reflective process. As with any type of professional activity, teachers should be invited into the process, not have it imposed upon them. Teachers should be included in the planning for collaborative portfolio experiences (Morgan, 1997). Before beginning any portfolio process,

participants needed to decide how the portfolio will be used; portfolio users reaped benefits only when the professional climate allowed them to flourish (Murray, 1995). Portfolios, designed to improve teaching practice, included a wide variety of information, including documentation and reflection on areas that needed improvement. Portfolios constructed for tenure or promotion should contain only examples of the teacher's best practice.

Teachers expressed concerns about how an administrator would react to seeing evidence of less than wonderful lessons. Because of this concern, teachers collected only their best efforts instead of creating a balanced portfolio that allowed them to honestly reflect on their practice and seek to improve it (Wagenen & Hibbard, 1998). Teachers often omitted information that might cause the reader to judge them negatively, causing the portfolio to present a slanted and unrealistic view of the teachers' performance (Hurst et al., 1998). Faculties needed to be convinced that by assembling a teaching portfolio they would not jeopardize their job and that their efforts would bear fruit. Teachers who conscientiously compiled a portfolio risked revealing their weaknesses as well as their strengths. They expressed concern over the potential misuse of self-reflective, evaluative documents which might be used to penalize faculty who honestly reflected on their perceived weaknesses. The purpose of a portfolio should be established at the beginning of its development. This alleviated natural suspicions of the faculty and created a climate where teaching, innovation, and risk taking were valued and cultivated (Murray, 1995).

One of the most popular functions of portfolio development was its use as an evaluation tool. Many school districts have moved toward allowing portfolio evaluation of teachers in place of, or in addition to, the formal observations of the past (Golomb,

1996). Over time portfolios revealed what teachers achieved and in which areas they needed assistance (Guiliano, 1997). However, beginning teachers suffered when criteria for the evaluation of instruction were confusing and inadequate (Zubizarreta, 1994). For evaluation to be equitable, a community of well-trained interpreters was necessary to assure defensible judgments (Lyons, 1996). Morgan (1977) found that a weakness in portfolio development was the lack of objective assessment. When teachers were willing to engage in a thoughtful examination of teaching practice and to make adjustments to those methods, their efforts needed to be validated and extended through regular and varied feedback and assessment (Morgan, 1997). Because of the differences in portfolios, it was sometimes difficult to compare one teaching performance to another. However, Murray (1995) concluded that it was impossible to provide sustained evidence of good teaching unless good teaching existed. Because of the differences in portfolio evaluation, Murray suggested, "If the value of a portfolio is to improve the quality of teaching, administrators would be well advised to avoid using portfolios for summative evaluation. To do so risks the corruption of a promise" (p. 170).

Professional teaching portfolios held great promise for educators. Career teachers, continuing to maintain a professional portfolio, were encouraged to continue reflection and refinement of their teaching practice. Collaboration with peers was a must for successful portfolio development and provided a powerful avenue for the exchange of educational theories and methods among teachers.

As with any professional tool, the success of a portfolio experience depended on careful planning and organizing which invited teachers to become participants and included them in all phases of portfolio development, including the planning. Teachers

needed an atmosphere of trust so that they felt safe enough to risk revealing their less proficient areas as they worked to improve their skill as a teacher. Choosing the purpose of the portfolio—promotion, tenure, or professional growth—before beginning the portfolio process and remaining with that purpose established teacher trust. Teachers needed to be able to risk showing their weaknesses if they were to improve them.

The implications of this research for education and personnel administration were many. Because of the many strengths of teaching portfolios, they could be an excellent tool for selection, training, and evaluating personnel; however, like any other tool their effectiveness was determined by how wisely they were used.

As an assessment tool, the portfolio was useful if the teacher knew from the beginning that it was to be used for assessment, and he or she was given a specific format to use. The teacher also needed to know the criteria by which his or her portfolio would be judged. The assessment portfolio was limited in its effectiveness as an evaluation tool when it presented only positive aspects of a teacher's practice. Therefore, the assessment portfolio was best used with other methods of evaluation.

Teaching portfolios were powerful professional development tools since they encouraged professional collaboration, self-assessment, and reflection. The teaching portfolio put the teacher in charge of his or her professional development, and that was its greatest strength. When the teaching portfolio was a successful professional growth tool, the teacher had bought into the process and helped in the planning for it. He or she was trained in collaboration and portfolio development, had an organized, structured format to use, and had a safe environment where he or she could use reflection without fear of his or her honest efforts being used against him or her.

Because the United States is facing a national teacher shortage, the researcher saw a great need to encourage veteran educators to continue in the profession and to work with them to improve their practice. Recruitment and training of new teachers is expensive. The training of existing teachers was often not only more economical but also resulted in a stronger product. A teaching portfolio was often a valuable professional development tool; however, it was only a tool, and its effectiveness was determined by the planning that went into its use and the staff's degree of interest.

National Board for Professional Teaching Standards Certification

The National Board for Professional Teaching Standards was established in 1987. Its mission is as follows:

to establish high and rigorous standards for what accomplished teachers should know and be able to do, to develop and operate a national voluntary system to assess and certify teachers who meet these standards, and to advance related educational reforms for the purpose of improving student learning in American schools. (National Board for Professional Teaching Standards, 2000c, p. 1)

The impetus for the work of the National Board for Professional Teaching Standards came from the follow-up report to A Nation At Risk which was entitled A Nation Prepared: Teachers of the 21st Century. This report named effective teaching as the most important element in schools and recommended creating an advanced certification process for accomplished teachers.

One of the greatest challenges the new organization faced was getting organizations to work together whose members had traditionally opposed each other. The great strength of National Board has been that teachers are leaders in defining and

improving their certification (Kelley, 1999). "National Board Certification is not a pedestal to honor a few teachers, but a platform for America's many accomplished teachers," said NBPTS President James A. Kelly ("National Board Certified Teachers Celebrate Milestone," 1999, p. 1).

Jim Hunt (1999), governor of North Carolina and founding member of the National Board for Professional Teaching Standards stated that the National Board and National Board Standards is a way to define teaching and get everyone behind America's teachers. Hunt emphasized the need for the process to remain voluntary.

National Board Certification involved critical elements: standards setting, assessment, and professional development. The National Board Standards for each certification area were based on the following five core propositions:

1. Teachers are committed to students and their learning;
2. Teachers know the subjects they teach and how to teach those subjects to students;
3. Teachers are responsible for managing and monitoring student learning;
4. Teachers think systematically about their practice and learn from experience;
5. Teachers are members of learning communities. (National Board for Professional Teaching Standards, 2000c, p. 3)

The five core propositions resulted from research by the National Board for Professional Teaching Standards into what successful teaching looks like in as many facets as possible. These qualities were combined and published for teachers to use and to aspire toward (Benz, 1997).

National Board Certification differs from state licensing in several ways. National certification, unlike the required minimum state licensing, is a voluntary certification and represents highly accomplished teaching based on a specific set of professional criteria. National Board Certification Standards are uniform across the country; however, state licensing varies from state to state. Finally, National Board Certification is based on a set of standards developed by educators for educators and is awarded to those who have passed a series of performance-based assessments both at their school site and at an assessment center.

National Board Certification is based on the belief that a fair, teacher-driven system that has integrity, is trustworthy, encourages collaboration, and is governed by a rigorous process of peer review will ennoble the profession rather than fragment it. This certification judges candidates primarily on performance, but it carries two prerequisites: a bachelor's degree from an accredited institution and 3 years of elementary, middle, or high school teaching experience (Sharpiro, 1993).

National Board Certification parallels other professions that have skills and assessments to measure those skills. Certification is both subject and age specific. Requirements for each certification area are based on professional standards for that area that mirror the five core propositions. Subject area standards were developed by a committee of 15 professionals, judged to be outstanding in their field. These standards provided the criteria for measuring a teacher's ability. Teachers are required to prove that they meet these standards by developing a portfolio that showcases their teaching and by successfully completing a subject-matter knowledge assessment center exercise. The process encourages teachers to reflect upon what they do in the classroom, whether their

goals are met, what their students learn from them, and how to improve their teaching (Benz, 1997).

When completed, the National Board for Professional Teaching Standards will offer assessments in 30 teaching fields. The fields will recognize the age of students, subjects taught and context of teaching, and will cover all teachers (Baratz-Sowden, Shapiro, & Streeter, 1993). During 2000-2001, National Board offered assessments in 19 subject areas which covered 87% of the teaching population (National Board for Professional Teaching Standards, 2000c).

An important aspect of National Board Certification is that the portfolio entries do not focus the assessment on the quality of student work or favor enriched teaching situations; the focus is rather on the teachers' performance and how they use the existing resources to help students (Benz, 1997). The National Board for Professional Teaching Standards recognizes teaching as an art and the need for teachers to have time to grow as artists and reflect on their teaching. The National Board Certification process is simply the best professional development activity available for teachers (Benz, 1997). This process encourages recognition of excellent teachers as leaders and mentors and elevates the public's perception of the teaching profession.

The first two National Board assessments were offered during the school year of 1993-1994 in the areas of Early Adolescence English Language Arts and Early Adolescence Generalist (Baratz et al., 1993). During the first 5 years of the assessment, teachers achieved a 44% certification rate. In 1998-1999, 5,400 teachers completed the assessment and 49% received certification (Rotberg, 2000). In November 2000, 4,719 additional teachers achieved certification bringing the total to 9,523. Seven hundred fifty

five of these are in Mississippi, the fifth largest number of any state in the nation (Hayden, 2000; National Board for Professional Teaching Standards, 2000a; Wheeler & Minichello, 2000). One hundred thirty one of Mississippi's National Board Certified Teachers work in the six coast counties served by the Gulf Coast Master Teacher Mentoring Project. Since Mississippi has a small overall population, it ranks second in the number of per capita National Board Certified Teachers, thus making this sample highly representative of the total.

In 1991 the National Board for Professional Testing Standards established a Technical Analysis Group (TAG) which was responsible for conduction research on the measurement quality of the performance assessments developed by the National Board. This group was charged with four tasks: validating the Board's assessments, characterizing the reliability of the Board's assessments, establishing standards of performance for awarding candidates National Board Certification, and investigating the presence and degree of adverse impact and bias in the Board's assessments (Jaeger, 1998).

Table 1

Per Capita Rankings of NBCTs

State	Total Teachers	Total NBCTs	% of Total Teachers	Rank Per Capita
California	284,030	786	.0028	4
Florida	156,234	1,268	.001	3
Mississippi	29,939	755	.025	2
North Carolina	89,235	2,407	.027	1

The format for National Board Certification has a standardized structure. The assessment consisted of a site-based portfolio with six entries. Four of the entries were classroom based and were accompanied by extensive analytical and reflective summaries. Two of the entries required videotape and two required student work samples as evidence of practice. The other two portfolio entries asked candidates to document their work outside the classroom with parents and community and with professional colleagues and organizations. The site-based portfolio yielded six separate scores with the classroom-based entries most heavily weighted. The current format will be revised for the 2001-2002 assessments.

The assessment center yielded four separate scores based on four separate prompts. These performance-based prompts asked candidates to analyze the stimulus material and respond in light of particular goals and given assumptions. The focus of the assessment center entries was content knowledge.

Responses to each entry are scored on a four-point rubric and assessors receive intense training in the use of the rubric. From 1993-1998, each entry was scored by a minimum of two scorers or a total of 20 scorers (Jaeger, 1998). Beginning in the year 1999-2000, each candidate's entries were scored by a total of no less than 12 scorers (National Board for Professional Teaching Standards, 2000c). Detailed scoring rubrics were developed for each exercise in the National Board assessment, and beginning with the school year 1998-1999 candidates received a scoring guide with their assessment materials. In addition, the level four rubric was printed in the instructions for each entry.

Since the National Board assessments were performance based rather than multiple choice assessments, content validation faced three issues. First, the domain to be

assessed needed to be clearly defined and justified. Second, the assessment needed to provide evidence of its congruence with the domain. And finally, the assessment needed to provide evidence of the validity of the scoring process.

To address these issues, the National Board formed and supported a Content Standards Committee of seven to 10 outstanding professionals for each of the certificate areas. These committees were responsible for defining what teachers should know and be able to do to demonstrate accomplished practice in their field. All certificate areas also met the basic five core propositions set forth by the National Board (Jaeger, 1998).

To establish congruence between the National Board assessment and its content area, the Technical Analysis Group conducted a series of studies, which obtained judgments on this issue from a panel of approximately 20 highly qualified, experienced teachers who had no prior involvement with National Board. This panel evaluated the assessments based on a series of specific questions. The panelists' judgments in response to these questions were compiled and summarized. These panels judged that National Board for Professional Teaching Standards' exercises and scoring rubrics were relevant to and important for assessing the content standards. After studying the assessment procedures, the panel determined that the assessments were valid (Jaeger, 1998).

Because of the unique structure of the National Board assessments, innovative psychometric methods were used for analysis of validity and reliability and for the establishment of performance standards. The assessments developed by the National Board for Professional Teaching Standards have been subjected to extensive psychometric scrutiny to ensure that any psychometric deficiencies were detected and corrected before they affected candidates for National Board Certification. Estimates of

reliability of the 10-exercise assessments now used by the National Board range from the high .70s to the mid .80s (Jaeger, 1998).

Teachers who have participated in the National Board Certification process have reported that it was an excellent professional growth activity. Velvet McReynolds, NBCT, found her students to be a support source as she went through the certification process. National Board was an opportunity to tell her story. An African American teacher, Ms. McReynolds challenged the charge that the National Board Certification process does not support diversity. Ms. McReynolds stated that the process itself makes diversity unavoidable since it asks teachers to tell the story of their practice, their successes, and their failures in their own fashion (McReynolds, 1999).

A major concern of the National Board is the small number and percentage of minority teachers who have achieved certification. Studies which addressed this issue have not found any reason for minorities certifying at a lower rate; however, the Board is concerned with this issue and has continued to study it. Increasing the number of African American teachers who successfully complete the certification process has also been a concern in Mississippi (Hayden, 2000).

Lindy Swain, National Board Certified teacher and teacher-in-residence with the National Board, left her classroom for 2 years to work with teachers. Swain described the National Certification process as providing a magnifying glass, which helped her clearly focus on areas in her teaching needing more work. The standards provided her with language to adjust her teaching practice to ensure student learning. After completing the National Board Certification process, Swain said that she saw people and teaching differently (Swain, 1999).

Not all teachers who have completed the National Board Certification process achieved certification. Jon-Paul Roden, department chair of the Vernon Public Schools Computer Science Department, did not. However, Roden found the certification process to be the most enriching experience of his entire professional life. The two lessons that Roden carried from the National Board Certification process were making time to reflect on the work of teaching and collaborating with colleagues (Roden, 1999).

Regardless of the positive reports from teachers who have gone through the certification process, the National Board Certification Process is not for every teacher. Christopher Stevenson, a math teacher at Miami Beach Senior High School, said, "Not every teacher is going to have the stick-to-it-iveness and savvy to go through the process. But it's a noteworthy accomplishment; and, as a resource teacher, I can see that it's a great fit for the profession" (Rose, 1999, p. 25). Leah Nachman, a Florida kindergarten teacher, identified the common thread for teachers as "you want to work with kids and do the best job possible" (Rose, 1999, p. 25). One of the greatest benefits of the certification process was that it encouraged teachers to talk to other teachers about teaching. This collaboration benefited teachers whether they achieved certification or not. Finally, an especially attractive facet of the certification process was that it raised the bar of achievement for all teachers since it represented teachers taking control of their profession and defining and evaluating teaching excellence (Rose, 1999).

Bob Chase, president of the National Education Association, saw National Board Certification as providing a definitive set of teaching standards to teachers and a way to measure their ability to live up to them. According to Chase, there was no better professional development activity than National Board Certification and it improved the

education of children. Chase identified the following reasons that NEA supports National Board Certification: (a) Certification is a national validation and recognition of excellent teaching ability; (b) For the first time teachers have a concrete set of national standards that make clear what teachers should be teaching and are a way to measure the effectiveness of teachers; (c) The majority of "experts" on the National Board are teachers. National Board Certification is a professional development tool created by teachers for teachers; (d) Everything takes place in your classroom. Your teaching becomes enriched regardless of the certification decision; (e) Many states and districts are offering financial and professional rewards for National Board Certification, and some states allow for license portability; (f) Nationally certified teachers report they enjoy increased clout and credibility; (g) National certification is a way for teachers to reinvigorate professionally; (h) National certification highlights your ability to teach by example and it uplifts the profession overall. Since teachers are in charge of standards of excellence, it raises teachers' professional stature in the public arena; (i) For the first time in history, teachers are able to rally around a model that reflects what they think teaching should look like; and (j) It makes you a better teacher and it makes things better for kids (Chase, 1999).

The National Board Certification process has gained the support of school administrators. Principal Nancy Shakowski (1999) identified the quality of teachers as the factor that determines the quality of a school. National Board Certification, according to Shakowski, keeps the focus on students and connects professional development to the classroom.

Education has historically impacted the economy of this country. Business has an important stake in the improving of teacher performance. In January 1998, the National Alliance of Business voiced its support of National Board Certification because it directly focused on teacher quality which resulted in education quality (Wehling, 1999).

Many schools of education have designed their preservice and graduate programs around the standards and process of National Board Certification. These provided benchmarks to use in the redesign of advanced master's degree programs which encourage reflection on practice, systematic inquiry into practice, and collaboration with others in meeting learners' needs (Diez & Blackwell, 1999).

President Clinton, a supporter of National Board Certification, emphasized the impact of teaching on the educational system and the importance of high standards for teachers.

We have to face the fact that if we want to have these standards for children we have to have a system that rewards and inspires and demands higher standards of teachers. They, after all, do this work; the rest of us talk about it and they do it. (Kelly, 1996, p. 2)

In an effort to attract a diverse group of teachers from a wide range of school districts to the National Board process, Secretary Riley recommended salary incentives for teachers who obtain advanced certification through the National Board for Professional Teaching Standards (Rotberg, 2000). National Board Certification has brought recognition and responsibility to those who achieved it. National Board Certified Teachers have identified three responsibilities: They have a responsibility to improve themselves and their teaching practice. Second, they have a responsibility to improve the

teaching professions by continuing to make positive contributions to the profession. Finally, National Board Certified Teachers have a responsibility to work to develop a measure of overall student achievement and to help their individual students develop into curious, capable learners (Gunter & Christensen, 1999).

Like every other educational innovation, National Board Certification has faced criticism. Rotberg (2000) conducted telephone interviews with 22 of 26 teachers who attempted National Board Certification and took part in support activities sponsored by their school districts and George Washington University. Most of the teachers in this study identified the National Board process as an extremely valuable professional development experience. However, Rotberg's study identified differences in the amount and quality of information available to potential National Board Certification Candidates. These differences in support, according to Rotberg, should be addressed in view of the significant contribution the National Board Certification process provided for teachers.

Rotberg (2000) suggested that the National Board for Professional Teaching Standards develop study guides to be made available to candidates in all areas. The study also suggested guidance, directly related to their subject-matter area, for teachers. Teachers reported the need for more and clearer information about the assessment itself which included information on the general framework of the assessment, the directions for taking the assessment, the assessment's separate components, the terminology used by the National Board, and the scoring criteria used for different types of questions. To address these discrepancies, the author suggested increasing state and local incentives and working to align the requirements of National Board Certification with the training offered in college schools of education. Rotberg also suggested that research was needed

to assess the impact of the certification process on the quality of teaching (Rotberg, 2000).

Students have been the ultimate benefactors of National Board Certification. The National Alliance of Black School Educators (NABSE), an organization of African American educators, recognized the need of students who live in low-income communities to receive the benefits from this certification. Therefore, they formed a coalition working with National Board to encourage more teachers of minority, low-income, and low-achieving students to pursue certification (Terrell, 1999).

The Accomplished Teaching Validation Study, conducted by researchers at the University of North Carolina in Greensboro, compared teachers who achieved National Board Certification with teachers who did not achieve certification on 13 dimensions of teaching expertise. The National Board Certified Teachers scored higher on all 13 dimensions and significantly higher in 11 of the 13 dimensions. In addition, the researchers examined samples of student work in classes taught by NBCTs and non-NBCTs. Almost three in four (74%) of the work samples produced by students taught by NBCTs in the study reflected a high level of comprehension of the concepts being taught compared to three in 10 (29%) of the work samples of students taught by NBCTs (National Board for Teaching Standards, 2000b; Research Links NBCTS, Student Learning, 2001).

Cattell's 16 PF and Teacher Personality

Webster's Seventh New Collegiate Dictionary (1967) defined personality as "the complex characteristics that distinguish an individual or a nation or a group; the totality of a person's behavioral and emotional tendencies, and the organization of an individual's

distinguishing character traits, attitudes, or habits" (p. 630). This section of the review of related literature deals with personality factors as measured by Cattell's 16 PF Questionnaire. The researcher found a limited amount of literature on teacher personality as measured by Cattell's 16 PF. This lack of literature indicated a need for research in this area.

Items for the 16 PF Fifth Edition were selected from a pool containing the best test items from all five existing forms of the 16 PF. A review of 34 separate factor analysis studies involving approximately 25,000 subjects sampled across different age, education, and socioeconomic levels supported the validity of both the number of factors and the nature of the simple structure solution of the 16 PF (Cattell & Cattell, 1995; Rivera, 1996).

The five global factors of the fifth edition of Cattell's 16 PF Questionnaire were obtained by factor analyzing the 16 primary factors. The five global factors included Extraversion, Anxiety, Tough-Mindedness, Independence, and Self-Control. The Extraversion scale measured how socially inhibited or socially participating an individual may be generally. The Anxiety scale measured the person's tendency to be tense and perturbable. The Tough-Mindedness scale measured the individual's open-mindedness and receptiveness. The Independence scale measured the person's agreeableness and independent nature. The Self-Control scale measured self-constraint versus the tendency to follow one's urges. Vansickle and Conn (1996) tested a sample of 17,770 students with different college majors and found the fifth edition of the 16 PF to be a useful tool for career guidance professionals (Vansickle & Conn, 1996). Appendix A depicts the personality factors in the fifth edition of Cattell's 16 PF.

Using the 16 PF Questionnaire, Phillips (1985) found that students of teachers who scored high in Independence, Assertiveness, Questioning, and Imaginativeness learned more than students of teachers who scored low on these traits (Phillips, Carlisle, Hautala, & Larson, 1985).

Ferris, Bergin, and Wayne (1988) conducted a study that compared job performance and absenteeism of public school teachers. The researchers used two scales of the 16 PF Questionnaire to study the relationship between a teacher's ability to control anxiety and independence. The study showed a significant inverse relationship between low ability to control anxiety and absenteeism, but only for females. The independence-absenteeism relationship was significant for females, but in the positive direction, which suggested that females high on independence tended to be absent more (Ferris et al., 1988).

Henderson (1990) used Cattell's 16 PF Questionnaire to examine the relationship between teachers' personality factors and their willingness to comply with administrative directives. This study found that trust, tender-mindedness, and shrewdness characterized teachers most likely to comply with administrator-determined policy directives. Teachers who were sober, conscientious, trusting, and tender-minded were more likely to comply with both teacher- and administrator-determined policy (Henderson, 1990).

Galbraith (1992) used an earlier edition of the 16 PF Questionnaire to compare men in elementary education to those in other professions. This study showed that men in elementary education scored higher on the Tough-Minded personality scale than did their female counterparts. Men in elementary education scored higher on scales dealing with human relationships than men in engineering fields (Galbraith, 1992). Teachers who

scored high on Cattell's personality factor Openness to Change were more likely to initiate change in their classroom management styles (Martin et al., 1995).

A 3-year study of 2,225 teacher education students used the 16 PF Questionnaire to study differences in personality of preservice teachers across time and gender. The results of this study indicated that men and women applying to teacher education programs share similar personality structures and that these remain stable from year to year. These findings supported the use of a single personality factor structure for both genders (Marth & Newman, 1993). In a study which used the fifth edition of the 16 PF, Martin and Baldwin (1996) found no significant difference between elementary and secondary teachers regarding locus of control or the Impression Management subscale of the fifth edition of the 16 PF (Martin & Baldwin, 1996).

Martin and Yin (1997) used the fifth edition of Cattell's 16 PF Questionnaire to compare classroom management styles between male and female teachers. Martin and Yin's study focused on the following six personality factors: Dominance (E), Rule Consciousness (G), Abstractedness (M), Openness to Change (Q1), Perfectionism (Q3), and Impression Management (IM). When comparing males to females, males scored significantly higher than females on only one subscale, Dominance (E). Martin and Yen (1997) found positive correlations between Instructional Management and Personality traits G (Rule Consciousness), Q3 (Perfectionism) and E (Dominance). Significant negative correlations were found between Instructional Management and subscales M (Abstractiveness) and Q1 (Openness to Change). People Management revealed significant positive correlations with G (Rule Consciousness); however, People Management showed a negative correlation with subscales M (Abstractedness), Q1

(Openness to Change) and IM (Impression Management). Behavior Management correlated positively with Q3 (Perfectionism) and negatively with M (Abstractedness) and Q1 (Openness to Change) (Martin & Yin, 1997).

This review of literature on the 16 PF Questionnaire Fifth Edition did not reveal information that supports a relationship between effective teaching and certain personality traits. Most of the studies did not focus on teacher effectiveness. Phillips (1985) found a relationship between student achievement and the personality traits of Independence, Assertiveness, Questioning, and Imagination. However, Phillips' study used an earlier version of Cattell's 16 PF Questionnaire, and only the factor of Independence was included in the fifth edition. Martin (1995) used the 16 PF Questionnaire Fifth Edition to find a relationship between Openness to Change and teachers' willingness to change classroom management. Since research has shown that students of NBCTs outperformed those of non-NBCTs, this research could be valuable in working with practicing and preservice teachers.

METHODOLOGY

Participants

The participants in this study consisted of 201 south Mississippi teachers. The researcher examined the relationship between personality factors among three groups of teachers—National Board Certified Teachers, teachers currently seeking National Board Certification, and teachers who have not yet chosen to pursue National Board Certification. Permission was granted by the Gulf Coast Education Initiative Consortium (GCEIC) for this study to be conducted.

The Gulf Coast Education Initiative Consortium is an organization of 16 Mississippi school districts that works for educational improvement for students in the south Mississippi area. The Gulf Coast Master Teacher Mentoring Project works under the direction of GCEIC and The University of Southern Mississippi. All participants in this study were 21 years of age or older and were teaching in the Mississippi counties of George, Jackson, Harrison, Hancock, Stone, or Pearl River. National Board Certified Teachers were those teachers who participated in the Gulf Coast Master Teacher Mentoring Project while they worked on the certification requirements of National Board. Those teachers pursuing National Board Certification were teachers currently enrolled in the Gulf Coast Master Teacher Mentoring Project. The teachers who had not yet chosen to pursue National Board Certification were teachers who teach in one of the six Mississippi counties served by the Gulf Coast Master Teacher Mentoring Project and who signed up for computer training conducted by the Gulf Coast Education Initiative Consortium. There were no exceptions on the basis of ethnicity, gender, religion, or creed. The participants were mainly female since the teaching population in south Mississippi is predominantly female.

This study was conducted under the guidance and following the guidelines of the Human Subjects Protection Review Committee of The University of Southern Mississippi. Participation was completely anonymous and voluntary, and information from the questionnaires was used only to compare data from one group to another and from one teaching area to the other. Participants were asked to give their consent to the questionnaire. If consent was not given, the respondent was instructed not to complete the questionnaire. A cover letter, explaining the purpose of the study, was attached to each

questionnaire as well as the required paragraph from the Human Subjects Protection Review Committee.

Instrumentation

Prior to the beginning of this study, the members of group 1 completed certification requirements and were certified by the National Board for Professional Teaching Standards as accomplished teaching practitioners. Members of group 2 had begun working on the requirements for achieving National Board Certification. Members of group 3 were randomly selected teachers who had not chosen to attempt National Board Certification. The author chose Cattell's 16 PF Questionnaire because of its established ability to assess specific factors of adult personality. Cattell originally developed his personality factors by factor analyzing a broad range of personality descriptors. As a result, the measure is not based on a particular personality theory and is not designed to distinguish one group from another (Rotto, 1995).

Participants choosing to participate in this study answered the 185 items on the fifth edition of Cattell's 16 PF Questionnaire that asked the participants to choose between choice a, b, or c. This questionnaire measured the following 16 primary personality factors: Warmth, Reasoning, Emotional Stability, Dominance, Liveliness, Rule-consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privatness, Apprehension, Openness to Change, Self-reliance, Perfectionism, and Tension. It took approximately 35-50 minutes to complete the questionnaire.

The questionnaire also measured the following five global factors: Extraversion, Anxiety, Tough-Mindedness, Independence, and Self-Control. The global factors

combined related primary scales into five global factors of personality (Rivera, 1996; Russell & Karol, 1994).

Participants also answered a demographic section which asked personal data questions of age, sex, race, years of teaching experience, grade currently teaching, subject currently teaching, area of National Board Certification, area in which currently seeking National Board Certification, or have not yet pursued National Board Certification.

Cattell and his colleagues revised the fifth edition of the 16 PF Questionnaire to reflect modern language and to remove the ambiguity for which the original instrument was criticized. They updated normative data to reflect the 1990 census and to meet federal civil rights legislation; it also made combined-gender norms available. Criterion scores have been added for the new factors of Empathy and Self-esteem, and criterion scores for factors from the earlier edition such as Adjustment and Creativity have been updated (Russell & Karol, 1994).

If 13 or more items were not completed the protocol was unscorable. There are three sets of scores found in the fifth edition of Cattell's 16 PF Questionnaire. The profile interpretation involved three steps. First, the researcher examined the response style indices to determine the validity of the participants' responses. Next, the researcher examined the global factors scores, which are more reliable and valid than the primary factor scores. The final step was to examine the scores from the primary factors (McLellan, 1995).

The fifth edition of Cattell's 16 PF Questionnaire was normed using a norm sample of 2,500 people whose demographic characteristics matched the 1990 census sample. There are several differences between the norm sample and the 1990 census. The

norm sample had 13.2% of the group in the 15- to 17-year-old range and the census sample had 4.6%. The sample has an over representation of people ages 65 and over. There was also a discrepancy in that the norm sample had an over representation of college graduates and an under representation of high school graduates (McLellan, 1995).

The test-retest reliability coefficients of the 16 PF for a 2-week period were very good for the global factors, ranging from .84 to .91. The reliability coefficients for the primary factors ranged from .69 to .84. The 2-month interval for the global factors dropped to a mean of .74, and the primary factors dropped to a mean of .7. The Cronbach's coefficient alpha rated internal consistency with values that range from .64 to .85 with a mean of .74 (McLellan, 1995; Russell & Karol, 1995).

Procedures

The data collection phase of this research project took place during the spring semester of 2001. Questionnaires were distributed in three ways. Teachers who were currently pursuing National Board Certification were asked to complete the survey during one of their small group mentoring sessions. The researcher obtained a random sample of teachers who were not currently pursuing National Board Certification by asking teachers who participated in computer training sessions that were conducted by the consortium to complete a computer version of the questionnaire during their computer training. Since teachers from rural and urban school districts, large and small school districts, county and separate municipal systems were taking part in computer training, the random sample was representative of the general population served by the Gulf Coast Master Teacher Mentoring Project. National Board Certified Teachers were mailed a letter explaining the study and asked to return a postcard indicating their agreement to participate in the study.

Those teachers who returned the postcard were mailed a questionnaire along with a stamped, self-addressed envelope for the return. The researcher included a self-addressed postcard for the National Board Teachers to mail when they mailed their questionnaire. Three weeks after the initial distribution date, the researcher mailed a follow-up letter that encouraged completion of the questionnaire to those National Board Certified Teachers who had not returned a postcard.

Participation was completely anonymous and voluntary, and information from the questionnaires was used only to compare data from one group to another and from the different teaching areas. Participants were asked to give their consent to completing the questionnaire. If consent was not given, the respondent was instructed not to complete the questionnaire. A cover letter explaining the purpose of the study was attached to each questionnaire as well as the required paragraph from the Human Subjects Committee.

If the participant chose to continue, he or she answered the 185-item 16 PF Questionnaire that asked the participants to choose between choices a, b, or c. This questionnaire measured the following 16 primary personality factors: Warmth, Reasoning, Emotional Stability, Dominance, Liveliness, Rule-consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privatness, Apprehension, Openness to Change, Self-reliance, Perfectionism, and Tension. The questionnaire also measured the following five global factors: Extraversion, Anxiety, Tough-Mindedness, Independence, and Self-Control.

The participants answered a demographic section that asked personal data questions of age, sex, race, years of teaching experience, grade currently teaching, subject

currently teaching, area of National Board Certification, area in which currently seeking National Board Certification, or have not yet pursued National Board Certification.

Data Analysis

This study considered three hypotheses:

H₁: There is not a significant difference between the personality factors of south Mississippi National Board Certified Teachers and teachers seeking National Board Certification.

H₂: There is not a significant difference between the personality factors of south Mississippi National Board Certified Teachers and south Mississippi teachers who have chosen not to pursue National Board Certification.

H₃: There is not a significant difference between personality factors of south Mississippi teachers seeking National Board Certification and south Mississippi teachers who have not yet chosen to pursue National Board Certification.

Hypotheses 1-3 were tested in two ways. First, the researcher tested these hypotheses by conducting a multiple analysis of variables test, a protected F test, and a Tukey post hoc test. The researcher used the three groups of teachers as the independent variables and used the raw scores computed by Cattell's 16 PF Questionnaire, fifth edition, on the five global personality descriptors of Extraversion, Anxiety, Tough-Mindedness, Independent, and Self-Control to measure the dependent variables. Using these variables, the researcher conducted a multiple analysis of variance test, a protected F test, and a Tukey post hoc test. The three groups of National Board Certified Teachers, teachers seeking National Board Certification, and teachers who had not yet chosen to pursue National Board Certification were the independent variables. The dependent

variables were measured by the raw scores for each participant computed on the 16 personality factors measured by Cattell's 16 PF Questionnaire, fifth edition. These 16 personality factors are Warmth, Reasoning, Emotional Stability, Dominance, Liveliness, Rule-Consciousness, Social Boldness, Sensitivity, Vigilance, Abstractedness, Privatness, Apprehension, Openness to Change, Self-Reliance, Perfectionism, and Tension.

The researcher investigated the relationship between the different teaching areas and demographic data such as age, number of years teaching experience, and subject and grade taught. The researcher grouped scores based on these variables and analyzed them to see if there was a relationship between these variables and personality factors, but she was unable to conduct these comparisons because of differences in the three groups. The alpha level used in testing all hypotheses was set at .05.

ANALYSIS OF DATA

Demographic Data

The researcher conducted chi-square tests to compare demographic data. Data from gender and education level comparisons are found in Table 2. These demographic comparisons showed several factors that might affect the findings. The group not seeking National Board Certification (NSNBC) contained more males than did the group seeking National Board Certification (SNBC) and the group that is National Board Certified (NBC), $X^2(2, N = 302) = 14.7, p = .001$. The National Board Certified Teachers were also better educated, $X^2(6, N = 201) = 34.8, p = .001$. The group of teachers not seeking certification had fewer teachers with master's degrees than did those seeking certification,

and the National Board Certified Teacher group had a greater percentage of teachers with master's than those seeking certification.

Table 2

Gender and Education Level of Participants

	NSNBC		SNBC		NBC		TOTAL	
GENDER	<u>N</u>	%	<u>N</u>	%	<u>N</u>	%	<u>N</u>	%
Male	5	14.3%	1	1.3%	1	1.1%	7	3.5%
Female	30	87.7%	74	98.7%	90	98.9%	194	96.5%
Total	35	100%	75	100%	91	100%	201	100%
EDUCATION LEVEL	<u>N</u>	%	<u>N</u>	%	<u>N</u>	%	<u>N</u>	%
Bachelor's	19	54.3%	22	29.3%	9	9.9%	50	24.9%
Master's	15	42.9%	51	68.0%	81	89.0%	147	73.1%
Specialist	1	2.9%	0	0%	0	0%	1	.5%
Doctorate	0	0%	2	2.7%	1	1.1%	3	1.5%
Total	35	100%	74	100%	91	100%	201	100%

NSNBC = Not Seeking National Board Certification

SNBC = Seeking National Board Certification

NBC = National Board Certified

The researcher compared the subject area taught by teachers by using a chi square test, $X^2 (34, N = 201) = 51.8, p = .026$. Teachers of English, math, science, gifted, and the other two groups. However, teachers of exceptional needs had a larger percentage of representation in the NSNBC and the SNBC groups than in the NBC group. Media was not represented in either the SNBC group or the NBC group but made up 8.6% of the NSNBC group. The lack of participation in the National Board process by media

specialists resulted from the unavailability of a National Board assessment for media before December 2001, the year after the study was conducted.

Table 3

Subject Area Taught by Participants

Area Taught	NSNBC		SNBC		NBC		TOTAL	
	N	%	N	%	N	%	N	%
Not Teaching	0	0%	0	0%	1	1.1%	1	.5%
All Subjects	12	34.3%	26	34.7%	33	36.3%	71	35.3%
English	1	2.9%	4	5.3%	9	9.9%	14	7.0%
Math	2	5.7%	4	5.3%	9	9.9%	15	7.5%
Science	0	0%	3	4.0%	5	5.5%	8	4.0%
Social Studies	3	8.6%	5	6.7%	7	7.7%	15	7.4%
Ex. Needs	6	17.1%	25	20.0%	7	7.7%	28	13.9%
Career/Tech	0	0%	8	10.7%	3	3.3%	11	5.5%
Reading	1	2.9%	2	1.3%	1	1.1%	3	1.5%
Dept. Elem.	3	8.6%	4	5.3%	5	5.5%	12	6.0%
Curriculum	1	2.9%	0	0%	0	0%	1	.5%
Gifted	0	0%	3	4.0%	7	7.7%	10	5.0%
Education	0	0%	0	0%	1	1.1%	1	.5%
Art	2	5.7%	0	0%	2	2.2%	4	2.0%
Music	1	2.9%	0	0%	1	1.1%	2	1.0%
Media	3	8.6%	0	0%	0	0%	3	1.5%
Speech	0	0%	1	1.3%	0	0%	1	.5%
P.E.	0	0%	1	1.3%	0	0%	1	.5%
Total	35	100%	75	100%	91	100%	201	100%

NSNBC = Not Seeking National Board Certification

SNBC = Seeking National Board Certification

NBC = National Board Certified

Next, the researcher compared the grade level taught by the respondents with a chi-square test. The group differences, based on grade level, was not significant, X^2 (16,

$N = 201$) = 22.7, $p = .117$). This analysis revealed that the K-3 group had a smaller percentage in the NSNBC group (14.3%) than the SNBC group (33.3%) or the NBC group (30.8%). The 9-12 group also had a smaller percentage in the NSNBC group (14.3%) than the SNBC group (28.0%), which had a smaller percentage than the NBC group (30.8%). The 4-6 grade group represented a larger percentage of the NSNBC (37.1%) than the SNBC (20%) and the NBC (19.85), and the 7-8 grade group represented a larger percentage of the NSNBC (28.5%) than the SNBC (17.3%), which was larger than the NBC group (15.4%).

Table 4

Grade Level Taught by Respondents

Grade Level	NSNBC		SNBC		NBC		TOTAL	
	N	%	N	%	N	%	N	%
Not Teaching	0	0.0%	0	0.0%	1	1.1%	1	.5%
All Grades	1	2.9%	0	0.0%	0	0.0%	1	.5%
Pre-K	0	0.0%	1	1.3%	0	0.0%	1	.5%
K-3	5	14.3%	25	33.3%	28	30.8%	58	28.9%
4-6	13	37.1%	15	20.0%	18	19.85%	46	22.9%
7-8	10	28.6%	13	17.3%	14	15.4%	37	18.4%
9-12	5	14.3%	21	28.05%	28	30.8%	54	26.9%
College	0	0.0%	0	0.0%	1	1.1%	1	.5%
Curriculum	1	2.9%	0	0.0%	1	1.1%	2	2.0%
Total	35	100.0%	75	100.0%	91	100.0%	201	100.0%

Finally, the researcher compared the SNBC group with the NBC group as to the area of National Board Certification they were seeking or had achieved (see Table 5).

Fifteen of the 19 National Board Certification areas currently available for teachers were represented in the two groups. Adolescence Young Adult P.E. became available in December 2000, so there were no NBCTs in that group. The SNBC groups in Early Adolescence Generalists and Adolescence Young Adult Art had no members, but the NBC group had representatives in both of these groups. The SNBC group of Adolescence Young Adult Mathematics and Adolescence Young Adult Science had a larger percentage than the NBC group. This could have impacted the primary factor of reasoning since these disciplines are noted for teaching analytical thinking. The SNBC groups of Adolescence Young Adult Career Technology Teachers and Exceptional Needs Teachers were represented by larger percentages than the NBC groups. This could be because both of these certificate areas were new in December 1999 and a small group of teachers attempted them last year.

Table 5

National Board Certification Area

NBC Area	SNBC		NBC		Total	
	n = 75		n = 91		n = 166	
	<u>N</u>	%	<u>N</u>	%	<u>N</u>	%
Early Childhood Generalist	18	24.0%	25	27.5%	43	21.1%
Middle Childhood Generalist	14	18.7%	18	19.8%	32	15.0%
Early Adol. Generalist	6	0.0%	1	1.1%	1	.5%
Exceptional Needs	18	24.0%	7	7.7%	25	12.2%
Early Adol. Language Arts	4	5.3%	11	12.1%	15	7.5%
Early Adolescence Mathematics	1	1.3%	0	0.0%	1	0.5%
Early Adolescence Social Studies	1	1.3%	3	3.3%	1	.5%
Early Adol. Science	2	2.7%	0	0.0%	2	1.0%
Adol. Young/Adult English	2	2.7%	4	4.4%	6	3.0%
Adol. Young/Adult Mathematics	3	4.0%	9	9.9%	12	6.0%
Adol. Young/Adult Science	1	1.3%	6	6.6%	7	3.5%
Adol. Young/Adult Social Studies	4	5.3%	3	3.3%	7	3.5%
Adol. Young/Adult Career Tech.	6	8.0%	2	2.2%	8	4.0%
Adol. Young/Adult Art	0	0.0%	2	2.2%	2	1.0%
Adol. Young/Adult P.E.	1	1.3%	0	0.0%	1	.5%

NSNBC = Not Seeking National Board Certification

SNBC = Seeking National Board Certification

NBC = National Board Certified

These comparisons indicated that the researcher could make comparisons among the three groups of National Board Certified Teachers, teachers currently pursuing National Board Certification, and teachers who have not chosen to pursue National Board Certification. However, the variance in demographics of the subcategories of the three groups indicated that demographic subcategory comparisons based on age and subject taught were impractical.

To compare the age and teaching experience of the three groups, the researcher used a one-way ANOVA. The ANOVA revealed no significant difference in the age of the teachers in the three groups. However, the mean of the SNBC group's teaching experience was slightly lower than the mean of the NSNBC group, whose mean was lower than the NBC group. Thus, the NBC group had slightly more teaching experience than the other groups.

Table 6

Means and Standard Deviations: Respondents' Age and Teaching Experience

	NSNBC n = 34		SNBC n = 75		NBC n = 91		Total n = 200	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	43.82	10.71	42.78	8.30	42.66	7.71	42.90	8.46
Teaching Experience	14.15	8.99	13.85	7.99	15.55	7.38	14.68	7.90

NSNBC = Not Seeking National Board Certification
 SNBC = Seeking National Board Certification
 NBC = National Board Certified

Tests of Hypotheses

This study considered the following null hypotheses:

H₁: There is not a significant difference between the personality factors of south Mississippi National Board Certified Teachers and teachers seeking National Board Certification.

H₂: There is not a significant difference between the personality factors of south Mississippi National Board Certified Teachers and south Mississippi teachers who have chosen not to pursue National Board Certification.

H₃: There is not a significant difference between the personality factors of south Mississippi teachers seeking National Board Certification and south Mississippi teachers who have chosen not to pursue National Board Certification.

The researcher tested the hypotheses in two ways. First, the researcher examined the global personality factors. Then the researcher examined the primary personality factors. The global personality factors of the three groups were identified by the fifth edition of Cattell's 16 PF Questionnaire. These global factors are Extraversion, Anxiety, Tough-Mindedness, Independent, and Self-Control.

To begin this analysis, a MANOVA to test the difference in the means of the global factors of each of the three groups was conducted. The researcher tested the three hypotheses by using a series of multivariate tests. The hypotheses were not rejected, $F(10/390) = .667$, $p = .756$. There was no statistically significant difference among the three groups on any of the five global scores.

Table 7

Means and Standard Deviations of Global Factors

Global Personality Factors	NSNBC $n = 35$		SNBC $n = 75$		NBC $n = 91$		Total $n = 201$	
	Mean	<u>SD</u>	Mean	<u>SD</u>	Mean	<u>SD</u>	Mean	<u>SD</u>
Extraversion	5.70	1.73	5.40	1.83	5.41	2.04	5.45	1.91
Anxiety	5.11	2.26	5.43	1.75	5.28	1.96	5.31	1.93
Tough Mindedness	5.44	1.39	5.12	1.67	4.99	1.71	5.12	1.64
Independence	4.79	1.92	5.21	1.97	5.22	1.89	5.14	1.92
Self Control	5.88	1.76	5.71	1.72	5.91	1.71	5.93	1.72

NSNBC = Not Seeking National Board Certification

SNBC = Seeking National Board Certification

NBC = National Board Certified

The 16 primary personality factors were examined. The researcher used a MANOVA to conduct a series of multivariate tests. The hypotheses were rejected, $F(32/368) = 1.48, p = .047$. To determine which primary factors differed among the three groups, the 16 primary factors were examined using a series of protected F tests. The protected F tests revealed that there was a significant difference among the three groups on Strand B, Reasoning, $F(2/198) = 15.36, p = < .001$. The results of the protected F are given in Table 9. The researcher conducted a Tukey post hoc. The result of the Tukey post hoc was that $NBC > SNBC > NSNB$.

Table 8

Means and Standard Deviations: Primary Personality Factors

Primary Personality Factors	NSNBC n = 35		SNBC n = 75		NBC n = 91		Total n = 201	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Warmth	5.26	1.74	5.41	1.77	5.40	1.97	5.38	1.85
Reasoning	4.94	1.66	6.23	2.04	7.01	1.85	6.36	2.03
Emotional Stability	6.26	1.90	5.96	1.87	6.34	1.82	6.18	1.85
Dominance	4.66	2.00	5.15	2.10	4.92	2.12	4.96	2.09
Liveliness	5.69	1.62	5.39	1.99	5.29	1.90	5.39	1.89
Rule Consciousness	6.63	1.68	6.48	1.62	6.85	1.62	6.67	1.63
Social Boldness	5.37	2.06	5.47	2.06	5.82	2.16	5.61	2.11
Sensitivity	6.57	1.70	6.52	1.75	6.76	1.52	6.64	1.63
Vigilance	5.60	2.17	5.61	1.58	5.48	1.59	5.55	1.69
Abstractedness	5.40	1.99	5.75	1.93	5.56	2.01	5.60	1.97
Privateness	5.09	2.05	5.57	1.73	5.55	1.82	5.48	1.83
Apprehension	5.89	2.10	6.21	1.85	6.13	1.86	6.12	1.89
Openness to Change	4.80	1.83	5.23	2.10	5.38	1.98	5.22	2.00
Self Reliance	5.11	1.81	5.57	1.91	5.66	1.79	5.53	1.84
Perfectionism	5.46	2.29	5.29	1.96	5.23	1.97	5.29	2.02
Tension	4.94	1.88	5.11	1.41	5.31	1.68	5.17	1.62

NSNBC = Not Seeking National Board Certification

SNBC = Seeking National Board Certification

NBC = National Board Certified

Table 9

Sixteen Primary Personality Factors

Primary Personality Trait	F	df	p
Warmth	.092	2/198	.913
Reasoning	15.364	2/198	<.001
Emotional Stability	.900	2/198	.408
Dominance	.680	2/198	.508
Liveliness	.566	2/198	.669
Rule Consciousness	1.051	2/198	.352
Social Boldness	.867	2/198	.422
Sensitivity	.468	2/198	.627
Vigilance	.136	2/198	.873
Abstractedness	.404	2/198	.668
Privateness	.977	2/198	.378
Apprehension	.358	2/198	.699
Openness to Change	1.082	2/198	.341
Self Reliance	1.139	2/198	.322
Perfectionism	.157	2/198	.854
Tension	.726	2/198	.485

H₁: There is not a statistically significant difference between the personality factors of south Mississippi National Board Certified Teachers and teachers seeking National Board Certification. The scores of south Mississippi National Board Certified Teachers on the personality factor of Reasoning, which compared abstract and conceptual reasoning versus concrete reasoning, were statistically significantly different at the .022

reasoning versus concrete reasoning, were statistically significantly different at the .022 level from scores of teachers seeking National Board Certification. Hypothesis 1 was rejected.

H₂: There is not a significant difference between the personality factors of south Mississippi National Board Certified Teachers and south Mississippi teachers who have chosen not to pursue National Board Certification. The scores of south Mississippi teachers seeking National Board Certification on the personality factor of Reasoning, which compared abstract and conceptual reasoning versus concrete reasoning, was significantly different from scores of teachers seeking National Board Certification at the <.001 significance level. Hypothesis 2 was rejected.

H₃: There is not a significant difference between the personality factors of south Mississippi teachers seeking National Board Certification and south Mississippi teachers who have chosen not to pursue National Board Certification. The scores of south Mississippi teachers seeking National Board Certification on the personality factor of Reasoning, which compared abstract and conceptual reasoning versus concrete reasoning was significantly different from the scores of teachers who have not yet chosen to seek National Board Certification at the .003 significance level. Hypothesis 3 was rejected.

Conclusions

The findings of this study indicated that teachers who were National Board Certified or who chose to seek National Board Certification were stronger in the area of abstract and analytical conceptual reasoning than teachers who had not taken part in National Board Certification training. Teachers in the National Board Certified group and the group of teachers seeking National Board Certification had participated in training

offered by the Gulf Coast Master Teacher Mentoring Project. One major focus of this project was training in analytical and reflective thinking and writing. Additional training was offered in analyzing student work samples to help in planning future instruction for students.

In a survey administered to the teachers currently pursuing certification, 93.5% reported that they had participated in instruction in descriptive, analytical, and reflective writing, and 96.8% indicated that they had participated in instruction that helped them learn to analyze student work to determine future instruction. On this survey, 90.3% indicated that their analysis of their teaching had improved as a result of completing the National Board Certification process (Richie & Price, 2001). Teachers in the group not seeking National Board Certification did not participate in this training.

Teachers have many reasons for pursuing National Board Certification, and these may affect their efforts to acquire the skills necessary to be successful in the certification process. On a survey administered to the 1999-2000 mentoring group, 98.4% listed salary increase as their reason for attempting the certification (Richie & Earnest, 2000), and 90.4% of the 2000-2001 group listed salary for their motivation. However, more than 70% of both groups indicated professional achievement and professional growth as reasons for completing the National Board Certification process.

Although the promise of a \$6,000 yearly pay increase encouraged many of the teachers to begin the certification process, most of the teachers indicated that it proved to be a professional growth experience for them. When a survey asked, "How have you grown professionally?" south Mississippi teachers pursuing National Board Certification gave the following answers:

- I stop to reflect now. Nothing is done automatically "just because." Reflection provides tremendous opportunity for growth.
- In examining my practice.
- In my reflections as a teacher.
- Recognizing why I teach the way I do; improving the way I teach. . . . I now recognize the importance of reflection.
- Self-analysis has helped me improve instruction, individualization of student instruction, and overall big picture of the teaching profession. I have a better idea of how to integrate instruction.
- I have grown in my awareness and need to reflect on the teaching process.
- Analyzing student progress and planning for instruction.
- I am more reflective regarding my practices and student needs/progress.
- I have become more aware of "impact on student learning." I have learned to evaluate everything I do with respect to "impact on student learning."
- I plan better for my teaching and think more about addressing the needs of specific students.
- Learning to analyze student work more carefully.
- Analysis of student work.
- I have become more conscious of what I am doing as I teach and why I am doing it.

The National Board Certification process is a portfolio process that requires the teacher to create a portfolio showcasing his or her professional practice. The portfolio includes several commentaries requiring the teacher to analyze his or her teaching

behavior, reflect on his or her practice, and revise the practice based on what he or she learned. One could argue that the National Board Certification process strengthens analysis and reflection by giving the teacher practice in these skills. Therefore, it is logical that teachers who have achieved certification or who are participating in this certification should be stronger in reasoning ability than teachers who have not taken part in this experience. It is also logical that teachers who have achieved National Board Certification are stronger in conceptual and abstract reasoning than a group of teachers who are seeking National Board Certification since some of these teachers will not demonstrate the skills necessary for achieving certification.

It would seem based on analysis of data that the National Board Certification process affects the development of higher order reasoning skills. The group seeking National Board Certification was near the end of the portfolio process; therefore, group members had the opportunity to develop higher conceptual and abstract reasoning skill through practice in analysis and reflection on their teaching during the portfolio process. The following statements from NBCTs and candidates further support this conclusion.

Martha Hart, NBCT, in early adolescence language arts said, "Being National Board Certified does not make me a better teacher. But the process I went through to become certified has made me a better teacher. I am more analytical in my evaluation of my teaching practice, and I reflect on my teaching" (M. Hart, personal communication, October 18, 1999).

Other teachers have commented on the lasting effect the certification process had on their teaching. Dorothy Stewart, NBCT, reported that the year after the certification process she found that she was applying what she had learned through the process in her

classroom. She said, "I think that it was the second year I really saw the benefits to my students because I was using what I learned" (D. Stewart, personal communication, October 18, 1999).

Candidate Toni Payne had taken student work to the central office to display and her daughter-in-law was helping her put up the work. Toni said, "I didn't know how much I had learned until I heard myself explaining to my daughter-in-law what the pictures showed about student understanding. I could look at the pictures and tell what the students did or did not understand" (T. Payne, personal communication, December 2, 2000).

Debbie Melaney, NBCT, reported that the change in her teaching was one of quality over quantity; she now does fewer things but does them more thoroughly and works on making connections in what she teaches. During the process, Debbie worried that she was doing less for her students because she was spending so much time working on her portfolio. A year after finishing the process Debbie said, "The reality was that working on my portfolio was working for my kids. I just wasn't spending my time making plaster of Paris fossils to bring them; I was bringing them a better teacher" (D. Melaney, personal communication, June 29, 1999).

The reasoning skills the process builds are best expressed by National Board Certified Teacher Cindy Davis: "I don't just do it just because it's fun anymore. Every activity has to have a reason that makes it right for helping my children learn" (C. Davis, personal communication, August 5, 1998).

The results of this study do not show if the teachers in the National Board Certified group or the group seeking National Board Certification came to the process

with superior analytical and abstract reasoning ability or if they strengthened or learned those abilities as a result of the National Board Certification process and the training offered by the Gulf Coast Master Teacher Mentoring Project. The study was also focused on a small geographic area, and its results may not be the same in other locations. To answer these questions, more research will need to be conducted.

The 1980s reform movement recognized that school improvement requires knowledgeable teachers with greater responsibility and authority for decision making (Darling-Hammond, 1988). This movement led to the formation of the National Board for Professional Teaching Standards, which affirmed the importance of a knowledgeable and concerned teacher and established teaching as a profession.

The National Board for Professional Teaching Standards recognized teaching as a demanding process that required the teacher to constantly assess the teaching-learning situations and make hundreds of decisions in a single day. National Board Certification required that the teacher explains his or her rationale for his or her practice and that he or she seeks to learn from experience. It is a process of analysis, reflection, and revision that becomes a rich field for improving professional practice. Strong analytical reasoning ability is necessary for a teacher to achieve this certification. In the end, it is the teacher's ability to demonstrate accomplished teaching practice and explain the rationale for his or her professional decision making that identifies the National Board Certified Teacher.

The goal of the Gulf Coast Master Teacher Mentoring Project is to provide support for teachers as they pursue National Board Certification and to provide opportunities for professional growth to National Board Candidates. The project believes that the reasoning skills of analysis and reflection, like any other skill, can be learned.

Because Mississippi has rewarded National Board Certification with financial incentives, teachers are motivated to acquire the skills it demands. The teacher is the single most important component in classroom instruction and is responsible for the learning environment in the classroom. By helping teachers improve their instruction, student learning will improve and schools can better meet the needs of the students they serve. These students will become the well-educated workforce needed to strengthen the economy and the well-informed citizens required for democracy to survive.

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