

2004

Recommended practices for effective teaching in the International Baccalaureate Program: An examination of instructional skills, assessment practices, and teacher-efficacy beliefs of IB teachers

Linda Prince Hutchinson
College of William & Mary - School of Education

Follow this and additional works at: <https://scholarworks.wm.edu/etd>



Part of the [Agricultural Economics Commons](#), [Curriculum and Instruction Commons](#), and the [Educational Administration and Supervision Commons](#)

Recommended Citation

Hutchinson, Linda Prince, "Recommended practices for effective teaching in the International Baccalaureate Program: An examination of instructional skills, assessment practices, and teacher-efficacy beliefs of IB teachers" (2004). *Dissertations, Theses, and Masters Projects*. Paper 1539618682. <https://dx.doi.org/doi:10.25774/w4-9bk3-vg85>

This Dissertation is brought to you for free and open access by the Theses, Dissertations, & Master Projects at W&M ScholarWorks. It has been accepted for inclusion in Dissertations, Theses, and Masters Projects by an authorized administrator of W&M ScholarWorks. For more information, please contact scholarworks@wm.edu.

**Recommended Practices for Effective Teaching in the International
Baccalaureate Program: An Examination of Instructional Skills, Assessment
Practices, and Teacher-Efficacy Beliefs of IB Teachers**

A Dissertation

Presented to

The Faculty of the School of Education
The College of William and Mary in Virginia

In Partial Fulfillment of the
Requirements for the Degree of
Doctor of Education

by


Linda Prince Hutchinson


April, 2004

**Recommended Practices for Effective Teaching in the International
Baccalaureate Program: An Examination of Instructional Skills, Assessment
Practices, and Teacher-Efficacy Beliefs of IB Teachers**

by Linda P. Hutchinson

Approved April, 2004


James H. Stronge, Ph.D.
Chair of Dissertation Committee


Megan Tschannen-Moran, Ph.D.



David Leslie, Ed.D.

TABLE OF CONTENTS

Acknowledgements	vi
List of Tables	viii
List of Figures	x
Abstract	xii
Half-Title Page	xiv
Chapter 1: The Problem	1
Introduction	1
Theoretical Rationale	5
Statement of the Problem	10
Research Questions	11
Significance of the Study	11
Definition of Related Terms	13
Limitations of the Study	16
Major Assumptions	17
Chapter 2: Review of the Literature	18
What is the International Baccalaureate	18
Program Design	18
Internationalism	21
The Implementation of the IB for School-wide Reform	22
Effective Teaching in General Education	25
Stronge's Effectiveness Teaching Model	25
Effective Teaching in Gifted Education	37
Stronge's Effectiveness Teaching Model	37
Effective Teaching in the International Baccalaureate Program	56
Research on International Baccalaureate Programs	56
Recommended Practices in the International Baccalaureate Program	63
Anecdotal Evidence on International Baccalaureate Programs	68
Summary	70
Chapter 3: Methodology	73
Research Questions	73
The Qualitative Case Study Method	74
Variables of Interest	76
Effective Teaching	76
Teachers Sense of Efficacy	77
Sample and Generalizability	78
Sample	78

Generalizability	79
Instrumentation	80
Effective Teaching	80
Teachers' Sense of Efficacy	82
Data Collection Procedures	84
Effective Teaching	85
Teachers' Sense of Efficacy	85
Data Analysis	85
Effective Teaching	86
Teachers Sense of Efficacy	87
Ethical Safeguards	87
Chapter 4: Summary of Results	89
Introduction	89
The Research Questions	90
The Sample	90
Response Rate to the Study	91
Observation Sample Process	93
Research Question 1 Results	94
Data Source of Key References	96
Key References: IB Curricular and Program Goals	101
References: Recommended Gifted Practices	105
Comparison: IB Goals & Recommended Gifted Practices	109
Comparison: Program Requirements and Gifted Practices	114
Summary of Research Question 1	117
Research Question 2 Results	117
Procedure	118
Instructional Differentiation	120
Instructional Focus on Learning	145
Instructional Clarity	148
Instructional Complexity	151
Expectations for Student Learning	154
Summary of Research Question 2	157
Research Question 3 Results	159
Assessment for Understanding	159
Quality of Verbal Feedback	162
Summary of Research Question 3	164
Research Question 4 Results	165
24 Item TSES Findings	168
TSES: Subscale for Sense of Efficacy in Student Engagement	171
TSES: Subscale for Sense of Efficacy in Instructional Strategies	175
TSES: Subscale for Sense of Efficacy in Classroom Management	178
Summary of Question 4 Results	181
Chapter 5: Discussion, Conclusions, and Implications	185
Discussion	187

Conclusions	188
Emerging Themes	188
Unanticipated Findings	199
Consequent Theme	203
Recommendations for Further Research	204
Summary	208
Appendix	212
Protection of Human Subjects Committee at the College of William and Mary	
Approval Letter	213
Cover Letter to Teacher Participants	214
Cover Letter to School Principal	216
Follow-up Letter to Teacher Participants	217
Teacher Effectiveness Behavior Scale: Instructional Skills	218
Teacher Effectiveness Behavior Scale: Assessment Practices	220
Teachers' Sense of Efficacy Scale	221
References	222
Vita	240

ACKNOWLEDGEMENTS

I would like to extend my gratitude to friends, family, and colleagues whose support enabled me to press on to completion of this educational endeavor. Sometimes we inadvertently achieve the perfect balance. The selection of my dissertation committee was one of those inadvertent opportunities. Dr. James H. Stronge, my committee chair, inspired this paper in the first place with his exceptional work in the field of teacher effectiveness. His encouragement and belief in my capabilities enabled me to believe in myself. His insight and high standards gently steered me back when the paper began to veer off target and held me to a standard that allowed me to be satisfied with nothing less than those same high standards. I always knew that if he liked it, it must be good. Dr. Megan Tschannen-Moran's countenance was a motivation in itself; her body of work is exceptional; her willingness to share her expertise was consistent. Dr. Leslie was often a bright spot during a tedious undertaking. His subtle wisdom and humor tempered the usual serious tenor of this task.

I also owe gratitude to my professional colleagues in Hampton City Schools for their encouragement and belief in me - Dr. Patricia Johnson, who persistently checked on my progress; Dr. Linda Shifflette, whose belief in me was constant; and Dr. Becky Lett whom I have grown to love. A special person in my life is doctor-to-be David Gaston. We struggled through much of this educational endeavor together. When he was discouraged, I encouraged him; when I was discouraged, he was there with a shoulder to complain on and motivation to push me forward.

Primarily I am thankful to my family. My husband John Hutchinson, my daughter Hope Hutchinson, my son Christien Murawski, and his wonderful wife and my friend, Dr. Wendy Weichel Murawski believed I could and would do this and do this well when I was not

convinced myself. If not for my husband, the house would not have been cleaned and meals would have been sparse. Sharing responsibilities consisted of my working on this paper and his doing everything else. Their genuine pride in me is our purpose for living.

A good friend recently quoted this anonymous saying, "The task before us is no greater than the power behind us." I thank my God, my family my friends, my colleagues.

LIST OF TABLES

1. The IB's Perceived Affect on University Performance	58
2. Instructional Skills: Findings on Instructional Differentiation	144
3. Instructional Skills: Findings on Focus on Learning	147
4. Instructional Skills: Findings on Instructional Clarity	150
5. Instructional Skills: Findings on Instructional Complexity	153
6. Instructional Skills: Findings on Expectations for Student Learning	157
7. Comparison of Descriptive Statistical Analysis of Instructional Skills	158
8. Assessment Skills: Findings on Assessment for Understanding	161
9. Assessment Skills: Findings for Quality of Verbal Feedback	164
10. Descriptive Statistical Analysis of Assessment Skills	165
11. Teachers' Sense of Efficacy Scale (long form)	167
12. Categorical Analysis of 24 Item Teachers' Sense of Efficacy Scale	170
13. Descriptive Statistical Analysis of 24 Item Teachers' Sense of Efficacy Scale	170
14. Teachers' Sense of Efficacy Scale: Subscale for Sense of Efficacy in Student Engagement	172
15. Categorical Analysis of Sense of Efficacy in Student Engagement	173
16. Descriptive Statistical Analysis of Sense of Efficacy in Student Engagement	174
17. Teachers' Sense of Efficacy Scale: Subscale for Sense of Efficacy in Instructional Strategies	176
18. Categorical Analysis of Sense of Efficacy in Instructional Strategies	176
19. Descriptive Statistical Analysis of Sense of Efficacy in Instructional Strategies	177

20. Teachers' Sense of Efficacy Scale: Subscale for Sense of Efficacy in Classroom Management	179
21. Categorical Analysis of Sense of Efficacy in Classroom Management	179
22. Descriptive Statistical Analysis for Sense of Efficacy in Classroom Management	180
23. Comparison of TSES and Subscale Statistics	182
24. Comparison of Descriptive Statistics for Teachers' Sense of Efficacy Studies	183, 201

LIST OF FIGURES

1. The International Baccalaureate Hexagonal Curriculum Model	20
2. The Six Domains of Effective Teaching	26
3. Key References Domain 1: Prerequisites of Effective Teaching	28
4. Key References Domain 2: The Teacher As a Person	30
5. Key References Domain 3: Classroom Management and Organization	31
6. Key References Domain 4: Organizing for Instruction	32
7. Key References Domain 5: Implementing Instruction	34
8. Key References Domain 6: Monitoring Student Progress and Potential	35
9. Key References: Qualities of Effective Teaching	36
10. TSES Subscale Groupings	83
11. Research Procedures	87
12. Stronge's Teacher Effectiveness Model	95
13. Key References: General Education, Gifted Education, & International Baccalaureate	97
14. Key References: International Baccalaureate Curricular & Program Goals	102
15. Key References: Recommended Practices for Gifted Education	106
16. Comparison of IB Goals and Recommended Gifted Practices	110
17. A Comparative Analysis of IB Program Design & Recommended Educational Practices	116
18. Instructional Skills: Patterns of Instructional Differentiation	142
19. Study Comparisons	143
20. Teachers' Sense of Efficacy Scale Subscale Groupings	166
21. Study Comparisons	168

22. Highest Item Response Rates for Student Engagement	172
23. Comparison of Teacher Effectiveness Behavior Scale Skill Areas to Items on the Teachers' Sense of Efficacy Subscale for Student Engagement	194
24. Comparison of Teacher Effectiveness Behavior Scale Skill Areas to Items on the Teachers' Sense of Efficacy Subscale for Instructional Strategies	195

ABSTRACT

The purpose of this study was to analyze the design and implementation of the International Baccalaureate Program for its fit as an advanced academic option. The first step involved determining the alignment of program and curricular goals with recommended practices for general and gifted education and, consequently, to examine the instructional practices and self-efficacy beliefs of International Baccalaureate teachers.

A review of literature revealed limited research on IB Program implementation and its grounding in recommended instructional practice. Therefore, a comparative analysis was conducted of IB program and curricular goals to determine their alignment with 21 recommended practices for gifted and general education. The comparative analysis indicated the alignment of the 21 practices to IB goals indicating the IB Program was a viable advanced academic option. Once the consistency of the IB model with recommended instructional practices was determined, an examination of teacher practices was conducted.

The context for establishment of a profile of IB teachers was in two school districts in Virginia. Thirty-three IB teachers responded to the Teachers' Sense of Efficacy Scale (Tschannen-Moran & Hoy, 2001), ten of whom were observed for 60 – 90 minutes to assess their instructional practices within the framework of two research-based dimensions of the Teachers' Effectiveness Behavior Scale (Stronge & Tucker, 2001): six instructional skills and two assessment practices.

The study developed a profile of an IB teacher, who implemented a variety of instructional strategies with a consistent focus on instruction from bell to bell, high levels of instructional clarity and complexity, and high expectations for student learning in and out of class. Teacher-directed strategies, in particular direct instruction (DI), were characteristic of

instruction during class time. End-of-course assessments (external assessments) appeared to be the force behind the teacher-directed approach to in class instruction. However, evidence indicated that internal assessments (IB program required work conducted by students and facilitated by teachers often outside of the class period) were characteristically student-directed independent study (IS) activities. The assessment driven IB profile is expressed formulaically as $A \rightarrow DI+IS$.

Findings in regard to teachers' sense of efficacy indicated high levels of teacher efficacy beliefs on the total TSES scale and on the three subscales. Respondents were more likely to respond that they had "quite a bit" to "a great deal" of influence over student behavior and their ability to implement effective teaching strategies. The highest rated items on the scale corresponded to the instructional skills and assessment practices on which teachers exhibited high levels of performance.

LINDA P. HUTCHINSON

PROGRAM ON EDUCATIONAL POLICY, PLANNING, AND LEADERSHIP

THE COLLEGE OF WILLIAM AND MARY IN VIRGINIA

**Recommended Practices for Effective Teaching in the International
Baccalaureate Program: An Examination of Instructional Skills, Assessment
Practices, and Teacher-Efficacy Beliefs of IB Teachers**

Chapter 1

THE PROBLEM

Introduction

Mulhern and Ward (1985) asserted that, “No program for secondary schools offers greater hope for bringing back high quality academics than does the International Baccalaureate” (p. 227). Claims such as these extolling the International Baccalaureate Program have emanated from a wide spectrum of venues from articles in professional journals written by educators such as Mulhern and Ward to articles in popular media sources written by education journalists. Jay Matthews (2003a), *Washington Post* columnist, develops the annual list of “The 100 Best High Schools in America” by computing the total number of IB and AP examinations administered by individual high schools. The journalist has focused national attention on the IB through this favorable comparison with the well-respected and longer established AP Program. [The College Board was established in the United States in 1955, while the IB was established in Geneva Switzerland in 1968 (The College Board & The IBO, 2002c).] From Mathews’ perspective, no programs have equaled the popularity of and impact on school improvement of the IB and the AP Programs over the past ten years (Mathews, 2002a, 2002b). “College admissions officers at many schools say that AP and IB have acquired the status of backstage passes at a rock concert” (Mathews, 2003a, p.50). However, although professional journals and the popular media have made extravagant claims about the IB, the warrants for these claims are few. To what extent does careful research support assertions that IB is a viable advanced academic option?

International Baccalaureate Program as Educational Reform

The IB Program has experienced phenomenal growth since its inception in 1968. IB Diploma Programs are implemented in schools worldwide at a rate of 10% or approximately 50 schools yearly, at a rate of 26% for Middle Years Programs (MYP), and 50% for Primary Years Programs (PYP). Approximately 48,000 students globally sat for IB examinations in 1997 compared to 78,000 students from 113 countries taking examinations in 2003. Although the IB originated in Geneva, Switzerland, over 50% of students sitting for IB examinations worldwide are in the United States (IBO, 2002b). One Raleigh, North Carolina county alone is opening six new schools annually, all of which are IB Program schools (IBO, 2003a). The number of authorized IB schools in the United States has increased from 103 in 1990 to 387 as of February 28, 2003 (IBO, 2002b; IBO & The College Board, 2002; Walker & Bollington, 2003).

Although the popular media has been influential in directing national attention to the IB, it is not responsible for the growth of the program. Only since 1999 has the IB been included as criteria for high school success by journalist Mathews who began examining rigorous academic options in 1982. The added “power of its international focus in a time of increased globalization” has peaked interest in the program nationally (J. Mathews, personal communication, July 23, 2003); nevertheless, it has been an important program internationally since the mid 1960’s.

Reform Options and Research

A spotlight has focused on the quality of education since publication of the 1983 report *A Nation at Risk: The Imperative for Education Reform* sounded an alarm for national educational reform. Federal and state governments have pressured school districts to enact school-wide reform and to provide appropriate advanced educational opportunities. As a result, school districts nationwide are implementing International Baccalaureate Programs as one option for

total school reform and, more specifically, as an option for advanced educational programming. The *No Child Left Behind Act (2001)* recommends access to advanced programs for all students; however, the legislation also requires any educational reform option to be based on valid research. Additionally, the National Research Council (NRC) has challenged the IB Organization to verify that its programming and teaching strategies incorporate teaching and learning theory and current recommended instructional practice (Gollub, Bertenthal, Labov, & Curtis, 2002).

Although the college and university success of IB graduates suggests the quality of its education, research validating program and teacher effectiveness is limited. In response to the NRC criticism, the IB Research Unit (IBRU) and the IB Curriculum and Assessment Centre formed a partnership calling for studies to provide these data (IBRU & IBCA, 2001). The vast amount of research and literature on effectiveness in general education and in advanced academic programming can serve as a springboard for research on advanced programs as options for school-wide reform and on the teachers who are key factors in achieving program goals.

Reform and Effective Teaching

The nation, state and federal governments, and, to its great credit, the teaching profession itself, intensified their focus on education with legislation and research impacting student achievement and teacher quality. Examination of a substantial body of research provides dramatic data substantiating the link between teaching and learning, indicating teacher quality to be the single most important school-related factor on student achievement (Mendro, 1998; Sanders & Rivers, 1996; Wenglinsky, 2001, 2002).

Teacher effectiveness and student achievement. There is a growing body of evidence that teacher quality matters. An extensive survey of practices and policies in 50 states found a significant correlation between student achievement in mathematics and reading and teacher

preparation and certification (Darling-Hammond, 2000). Moreover, value-added research indicated that students with ineffective teachers experienced negative residual effects which were evidenced in lowered scores on achievement tests for up to three years (Sanders & Rivers, 1996).

Teachers who consistently enable their students to meet the high demands of rigorous academics and standards-based assessments have developed skills, wisdom, and expertise which are at the heart of education reform (Brown & Moffett, 1999). They are the experts from whom a database of professional knowledge can be constructed (Hiebert, Gallimore, & Stigler, 2002). Recognizing the expertise of expert teachers and the significant effect of teacher quality on student achievement (Mendro, 1998; Sanders & Rivers, 1996; Wenglinsky, 2001, 2002), IB Program administrators actively recruit the most effective teachers (Garton, 2000; Gollub, et.al, 2002).

The IB and effective teaching. The International Baccalaureate Program's appeal for teachers lies in the high achievement and motivation levels of students, in the respect afforded teachers for their expertise, and in the career advancement opportunities offered in the IB. If the IB successfully recruits the best teachers, these professionals can serve to create a professional knowledge base for the education community in its endeavors to improve educational approaches based on teaching and learning theory. If a teacher is capable of meeting the responsibilities of IB to teach to state and international standards and criterion-referenced tests, to infuse internationalism into instruction, and to meet the needs of high ability and gifted student, this teacher has expertise that will enhance the database of effectiveness research. Although research describes effective teaching for general, gifted, and high ability students, the literature on effective teaching for teachers of IB is extremely limited. Whether IB teachers fulfill the qualities of effective teachers has not been examined. Since IB is experiencing exceptional

growth and public attention, information on the practices of IB teachers would add valuable data to the base of effectiveness research.

The International Baccalaureate Program holds potential for educational reform; however, what is the evidence that recommended practices for teaching and learning are implemented by its teachers? Can high levels of student achievement be attributed in part to IB teachers characterized by high levels of teacher-efficacy beliefs? Do IB teachers employ instructional skills that challenge metacognitive development of students? Do they practice monitoring strategies that enable students to achieve to their potential? Moreover, as a highly recommended option for gifted and high ability students, are the practices of IB teacher consistent with those recommended for teaching in advanced academic programs?

Theoretical Rationale

The theoretical rationale for this study is predicated on the theory of teaching and learning. The education system is designed on the premise that the learning process is intertwined with the teaching process. Despite the findings in the Coleman Report (1966) that factors other than instruction more significantly impact student learning, decades of research have established a definitive connection between effective teaching and student achievement. In fact, specific qualities, strategies, and methodologies have been identified as having a significantly greater impact on student performance than others (Marzano, Pickering, & Pollard, 2000; Stronge, 2002; Wenglensky, 2002). Effective teaching is centered in the theory of learning, and effective programs provide the environment in which to practice the art. In meta-syntheses of research on learning, two National Research Council committees identified seven research-based principles of learning that serve as the foundation for quality instruction (Gollub,

et.al. 2002; Bransford, Brown, & Cocking, 2000). The major research, summarized by the meta-analyses, is identified for each principle:

1. Principled conceptual knowledge – learning structured around major concepts and principles of a discipline (Lampert, 1986).
2. Prior knowledge – building on what students already know or dispelling misconceptions about a subject (Vygotsky, 1978).
3. Metacognition –the practice of self-monitoring with the goal of becoming more aware of one’s thinking processes and more in control of one’s learning processes (Garner & Alexander, 1989).
4. Differences among learners – differentiating instruction based on students’ abilities and approaches to learning (Bell, O’Brien, & Shiu, 1980).
5. Motivation – a student’s determination to be a successful learner (White, 1959).
6. Situated learning – varied contexts conducive to conceptual learning and application of knowledge (Kobayashi, 1994).
7. Learning communities – situations that promote teamwork and collaborative learning (Lave, 1991).

The effective teacher develops an understanding of pedagogy that reflects an understanding of and expertise with these principles.

It is a common misconception of teaching that a set of general teaching methods is effective for all students in all disciplines; however, this misconception has been defused by these seven principles, research on the distinctive nature of disciplines, and effectiveness teaching research (Bransford, Brown, & Cocking, 2000). A cornerstone of teaching theory is the concept of differentiated instruction in which delivery of instruction is determined according to

the strengths of the learner (Kapusnick & Hauslein, 2001) and the epistemologies of subject-matter disciplines (Bransford, Brown, & Cocking, 2000). Teaching that does not consider individual differences may result in lost opportunities for optimal learning. Instruction, or lack of it, for gifted and high ability learners is often erroneously predicated on the assumption that high end students will learn regardless of teaching methodology. Instead, this approach teaches gifted learners to become mentally lazy and cynical underachievers (Agne, 2001). Appropriate advanced academic programs are designed according to Vygotsky's theory of the Zone of Proximal Development which stretches learners' cognitive abilities beyond their comfort zones (Vygotsky, 1978).

Teachers make a difference in the learning of students along all the points of the continuum. To effectively serve their particular populations, programs such as the IB, will incorporate teaching theory into program design and select teachers whose approaches to teaching and interactions with students are situated in these understandings (Bransford, Brown, & Cocking, 2000; Gollub, et.al., 2002).

With the premise that "the actions of students, teachers, and parents matter most to student learning" (Wang, Haertel, & Wahlberg, 1993, p. 279) the theoretical framework of this study will center on Stronge's *Qualities of Effective Teachers* (2002) and the model of Teacher Sense of Efficacy defined by Tschannen-Moran, Hoy and Hoy (1998).

Effective Teaching Theory

The frequently underestimated task of quality teaching is often exacerbated by reluctant learners who chose to drop out of school or to settle for inferior work rather than expending additional effort to produce work of excellence. With this understanding, Glasser stated, "An effective teacher is one who is able to convince not half or three quarters but essentially all of his

or her students to do quality work in school” (1990, p.14). Quality teaching is not a process of implementing isolated teaching skills; rather it is embodied within a person who assumes the role of the teacher, and who, in fact, becomes all that is defined as teacher. “They directly affect how students learn, what they learn, how much they learn, and the ways they interact with one another and the world around them” (Stronge, 2002, p.vii).

Several decades of significant effectiveness research were synthesized in a seminal book, *Qualities of Effective Teachers* (Stronge, 2002) that resulted in the development of a holistic picture of the effective teacher in a general education setting. The synthesis, which serves as the framework for this study, defines effectiveness according to the following domains:

1. Prerequisites of Effective Teaching
2. The Teacher as a Person
3. Classroom Management and Organization
4. Organizing and Orienting for Instruction
5. Implementing Instruction
6. Monitoring Student Progress and Potential

Teaching is both a process and the achievement of the intent of the process. Without learning, teaching has not occurred. Inadequate teaching results in inadequate learning; quality teaching results in quality learning (Glasser, 1990; Sanders & River, 1996; Stronge, Tucker, & Ward, 2003). “What teachers know and can do is the most important influence on what students learn” (National Commission on Teaching and America’s Future, 1996, p.vi). It is an art in which the artist is a flexible manipulator of pedagogy and content, determining the direction of the interaction according to the individual needs and strengths of the learner (Rubin, 1985).

Students of all ability levels hold equal importance with optimal achievement for all students as the goal of effective teaching (Kapusnick & Hauslein, 2001, VanTassel-Baska & Little, 2003).

Quality schools are not possible without quality teachers. If learning is to take place, instruction must be the centerpiece of any reform effort (Wang, Haertel, & Wahlberg, 1993). Unfortunately, “effective teaching may be the hardest job there is” (Glasser, p.14). The teacher undertakes the act of teaching to produce a product in an often resistant population. Yet, the effective teacher is aware of the challenge and believes in his or her ability to control the process and the outcome of teaching (Glasser, 1990; Tschannen-Moran, Hoy, & Hoy, 1998).

Teachers' Sense of Efficacy Theory

The concept of Teacher-Efficacy has at its foundation Bandura's theory of self-efficacy. Bandura defines self-efficacy as the individual's belief about the ability to control their own functioning and the events affecting them rather than the individual's actual level of competence. The human acts of behaving, thinking, feeling and experiencing motivation are influenced by one's self-efficacy beliefs (Bandura, 1993). Bandura (1997) proposed a link between self-efficacy and cognitive processing, asserting that those with low self-efficacy diminish their expectations, find difficulty in remaining task oriented, and reduce the quality of their performance. When faced with challenge perceived to be beyond their capabilities, they will either lower expectations to accept mediocre results or abandon the effort entirely. Individuals with strong beliefs in abilities to succeed in difficult situations will exhibit perseverance and exert additional effort to master the challenge. They are willing to experiment with new ideas and strategies in order to meet the needs of the situation.

The theory of teacher-efficacy is an integrated concept influenced by Bandura's self-efficacy theory. The teacher-efficacy model that serves as the theoretical framework for this

paper is the model developed by Tschannen-Moran, Hoy, and Hoy (1998). Teachers' self-efficacy judgments are based on two interrelated assessments:

1. *analysis of teaching task and context*
2. *self-perception of teaching competence*

In analyzing the *teaching task and context*, the teacher evaluates the relative importance of factors that constrain or inhibit teaching in relation to the teacher's assessment of the resources available that are conducive to learning. In assessing *self-perceptions of teaching competence* a teacher weighs personal capabilities against personal weaknesses in the teaching task at hand. Assessments about self-efficacy emanate from the interaction of the judgments formed in the analyses of these two dimensions.

The characteristics of a teacher with high teacher-efficacy are described in Domain 2 of Stronge's (2002) model of the effective teacher. By impacting a teacher's effort, goal-setting and risk-taking behaviors, aspiration, perseverance, and persistence (Tschannen-Moran & Hoy, 2001), the construct is related to levels of student achievement, motivation, and efficacy (Stronge). Therefore, an exploration of teacher-efficacy beliefs in International Baccalaureate instructors would enhance understanding of the IB teacher.

Statement of the Problem

The purpose of this study is to examine specific recommended practices for teachers in the International Baccalaureate Program within the framework of Stronge's Model of Effective Teaching and to compare those practices to recommended practices for instruction of gifted and high ability learners. The study will analyze data collected from reviews of literature, observations, and questionnaires from International Baccalaureate teachers based on the following questions:

Research Questions

1. How do recommended International Baccalaureate curricular and program goals compare to practices recommended for effective instruction in general education and for gifted/high ability learners?
2. As determined by observation to what degree do teachers of International Baccalaureate students exhibit effectiveness behaviors in their implementation of instructional skills?
3. As determined by observation, to what degree do teachers of International Baccalaureate students use a variety of assessment practices to monitor student progress?
4. At what levels do teachers of International Baccalaureate students self-report their Teacher-Efficacy beliefs in comparison with a sample of a cross-section of high school teachers?

Significance of the Study

The IB Program is experiencing a strong rate of growth in an educationally critical era when schools and teachers have experienced intense scrutiny and become high profile political issues. Perceptions of quality underlie the program's rapid growth and competition among students and parents for enrollment in its classes (Gehring, 2001; Lord, 2002). The *No Child Left Behind Act* (2001) lists the IB as an advanced academic option for educational reform and the Commonwealth of Virginia accepts the program as an option that meets the stipulations of The Virginia Plan for the Gifted (1996). Along with other advanced programs, the IB has become a recommended option for a rigorous college preparatory education for gifted and high-

end learners (Feldhusen, VanTassel-Baska, & Seeley 1989; Matthews, 2002a; Nugent & Karnes, 2002; Renzulli, 1997; Speed & Appleyard, 1985).

However, what research has been conducted on the teaching and learning practices of the program or on the teachers who are responsible for leading its students to high levels of achievement? During its two year study of nationally recognized academic programs for advanced study of mathematics and science in United States high schools, the National Research Council (NRC) found that critical data on teaching and learning for these programs, specifically IB and AP, was lacking (Gollub, J., Bertenthal, M., Labov, J., & Curtis, P., 2002). The literature on the IB is limited to anecdotal evidence, individual profiles, and research providing data on IB students - their satisfaction with the program, their high levels of performance on standardized examinations, and their success in college and university settings (Dueval, 1999; Kolb, 1999; Kolb, 2002; Scaturro & Campbell, 2003). Although IB data indicates that its graduates are successful and satisfied with the results of their IB education, research does not provide evidence indicating how the IB accomplishes high levels of success. It does not answer the questions posed by Gollub and others (2002) of the National Research Council on the instructional practices implemented by teachers in the IB or on the consistency of teacher practices with current research on teaching and learning. The NRC strongly recommended that the IB Organization:

- ...should take more responsibility for ensuring the use of appropriate instructional approaches. Specifying the knowledge and skills that are important for beginning teachers and providing models for teacher development are likely to advance teacher effectiveness.

- ...should develop programs of research on the implementation and effectiveness of their program. (p. 14-15)

Recognizing the validity of these two specific recommendations, the IB Research Unit recently partnered with the IB Curriculum and Assessment Centre (IBRU & IBCA, 2001, p.1-2).

Preparation for advanced academic programs begins as early as middle school. To be eligible for and to achieve success in these programs, students are expected to attain a sound conceptual knowledge of core skills, such as algebra, foreign language, and writing from early middle school years. Consequently, school districts often restructure their secondary school offerings to be consistent with advanced program expectations; thus, these programs have “a profound influence on the course structure and course taking patterns of all students throughout the high school years” (Gollub et.al., 2002, p.23). Moreover, as a result of their two year study of the program, the NRC claims that teachers of advanced programs, “who are often among the best in their schools – are a critical resource for the entire school system” (p.23-24). Considering the value-added impact of advanced academic programs on school districts, and the imperative to provide evidence of their viability as options for general and advanced education, a body of careful research should be completed on the consistency of the teaching practices of teacher in these programs with those recommended for teaching in general education and advanced academic settings.

Definition of Related Terms

Effective teaching. The concept refers to a research-based comprehensive profile developed by Stronge (2002) of teacher behaviors and other effectiveness factors. Stronge’s Model of Effective Teaching includes only those factors of preparation, personality, and practice within the control and influence of the teacher. Although all six domains (Prerequisites of

Effective Teaching, The Teacher as a Person, Classroom Management and Organization, Organizing and Orienting for Instruction, Implementing Instruction, and Monitoring Student Progress and Potential) will be examined, specific characteristics of the domains will be studied for their relevance as effectiveness factors for teachers of students in advanced educational settings.

Gifted learners. The term gifted learners refers to the designation for highly creative and productive students characterized by interlocking clusters of outstanding ability, task commitment, and creativity. Identification is determined by either intelligence, achievement, or aptitude standardized tests. Students may be high in verbal or non-verbal ability or both and may excel in one or more aptitudes (e.g., spatial, mechanical). They require differentiated and specialized programs and services in order to achieve to their highest levels of performance (Marland, 1972; Renzulli, 1986, 1999). They comprise the upper 12% of the population in any given school district (VanTassel-Baska & Little, 2003).

High-ability learners. This term refers to and includes individuals similarly described above as gifted (Renzulli, 1986, 1999), but who comprise the upper 20% academically of students in any given school district (VanTassel-Baska, & Little, 2003). This study uses the terms high ability and high level interchangeably.

Instructional skills. Instructional skills will be defined as instructional differentiation, focus on learning, clarity, complexity, and expectations for student learning.

International Baccalaureate. Although the IB has a K-12 educational program, the term will be used to refer to the International Baccalaureate Diploma Program, a demanding pre-university program designed for highly motivated students aged 16 to 19. It is a criterion-based standards and assessment system in which students take 6 advanced academic subjects in the

humanities and sciences (IBO, 2002a; IBO, 2002c). It is highly recommended for and generally enrolls gifted and high ability learners. Most schools in the United States include a Pre-International Baccalaureate (Pre-IB) Program for grades 9 and 10 to prepare students for the requirements of the IB Program in grades 11 and 12.

Internationalism. The term refers to the study of nations, cultures, languages, and histories in order to foster intercultural understanding and respect (IBO, 2003a; IBO, 2002a; Paige, 2002). In the International Baccalaureate context it also refers to the approach to programming – design of subject matter, standards, and assessments. Five different aspects of internationalism, determined through McKenzie's (1998) research of international programs, including the IB, are intrinsic to the IB approach to education.

non-national (not subject to the requirements or standards of any particular national system), pan-national (seeking to build bridges between countries), multi-national (as in the context of the curriculum, which draws from a number of national education systems) and trans-national (in the sense that it leads to a certificate which allows students to 'cross educational borders with the same ease that a valid passport permits movement from one country to another') (in Hayden, Rancic, & Thompson, 2000, p.108).

Questioning. Questioning refers to the pattern of inquiry employed by teachers to create an interactive process in order to clarify student knowledge and understanding and build higher-level thinking (Feldhusen, VanTassel-Baska, & Seeley, 1989).

Learning theory. Learning theory will be defined as specific research-based principles (principled conceptual knowledge, prior knowledge, metacognition, differences among learners, motivation, learning communities, situated learning) that underlie effective educational programming. The principles can serve as a framework for design of effective academic

programs, professional development, teaching, curriculum, and assessment (Gollub, Bertenthal, Labov, & Curtis, 2002).

Metacognition. The term refers to the process of becoming aware of one's own cognitive system. It involves thinking about what we know and don't know and controlling how we learn with the goal of thinking more effectively (Feldhusen, VanTassel-Baska, & Seeley, 1989).

Monitoring Student Progress. Monitoring student progress will be defined as assessment for understanding and quality of verbal feedback to students.

Recommended practices. The term recommended practices refers to teaching strategies, teaching methodologies, and programming design recommended in research to optimize student performance.

Teacher sense of efficacy. The term refers to the teacher's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning" (Tschannen-Moran & Hoy, 2001, p.783) among all levels of learners. The model developed by Tschannen-Moran, Hoy and Hoy (1998) is defined by the two interrelated dimensions of *analysis of teaching task and context* and *self-perception of teaching competence*. The terms teacher self-efficacy and efficacy beliefs are used interchangeably.

Limitations of the Study

The following limitations are applicable to this study.

1. The generalizability of this study may be limited to International Baccalaureate Diploma Programs that require students to complete the entire program rather than IB Certificate Programs that award certificates to students for completing individual IB courses.
2. The structure of International Baccalaureate Programs differs by nation, school district, and community needs, thus, limiting the generalizability of this study to programs similar in structure to those studied in the Commonwealth of Virginia.

3. The assessment of teachers' sense of efficacy is based on self report by IB teachers and may not reflect actual levels of teacher-efficacy beliefs.
4. The norming sample for teachers' sense of efficacy may include gifted/talented or IB teachers.
5. The researcher is involved in the IB Program. While the role of participant-observer expands the knowledge base of the researcher, it may also interject bias.
6. Although characteristics of International Baccalaureate Program teachers vary, e.g. in years of teaching experience in general education as well as in the IB Program, the data will not be aggregated by demographic characteristics.

Major Assumptions

The major assumptions underlying this study are listed below.

1. Teachers are integral to student learning.
2. Teacher-efficacy is vital to effective instruction.
3. International Baccalaureate teachers have sufficient familiarity with the IB Program design and requirements.
4. International Baccalaureate teachers involved in this study have experienced the training required and sanctioned by the IB Organization.
5. International Baccalaureate teachers involved in this study were specifically selected for their teaching assignments by their individual school administrators.
6. The instruments used in this study are valid measures of the intended variables.
7. Effective teachers are characterized by the Six Domain model used in this study.
8. The teachers' sense of efficacy model employed in this study is a valid model for defining the concept.

Chapter 2

REVIEW OF THE LITERATURE

Quality education and effective teaching continue to be political issues in the national and state arenas as well as in the education forum. Decades of research have been conducted and vast bodies of literature written to identify the elusive, and often subjective, effectiveness factors. Programs, teachers, students, and classrooms have been examined to determine the most productive settings and instructional behaviors. In this chapter, literature and research on teacher and program effectiveness in general education, in gifted/high ability education, and in the International Baccalaureate Program are reviewed to build a profile of the qualities necessary for effective teaching in the IB Diploma Program.

What is The International Baccalaureate?

Program Design

The IB is a comparatively recent program in the United States, having been implemented in Geneva, Switzerland in 1968 (IBO, 2003b), The *IBO Guide to the Diploma Program* (2002b) describes the International Baccalaureate Diploma Program as a grade 11-12 advanced integrated academic program that offers the prestigious IB diploma to students who complete specific program requirements.

Subject Groups

Students must pass examinations in rigorous academic subjects, one from each of six liberal arts subject groups. The subject groups that comprise the curriculum are:

1. Language A – native language of the nation
2. Language B – a second language

3. Individuals and Societies –includes history, geography, economics, and psychology
4. Experimental Sciences – includes biology, chemistry, and physics
5. Mathematics – includes mathematical studies, mathematical methods, and higher level mathematics
6. Arts and Electives – includes visual, theater, and music arts

Course Components

“The programme has the strengths of a traditional liberal arts curriculum, but with three important additional features, at the centre of the hexagonal curriculum model” (p.4). Students are required to complete three additional components.

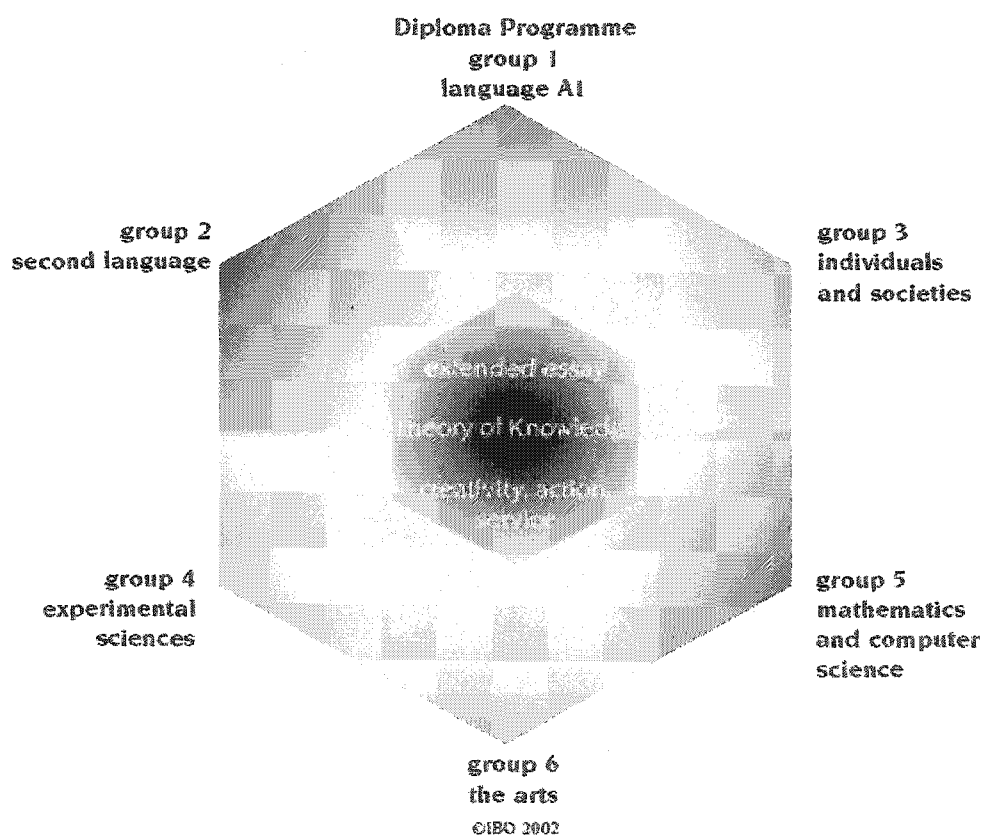
- Theory of Knowledge (TOK) – an interdisciplinary, integrative course “intended to stimulate critical reflection on the knowledge and experience gained inside and outside the classroom. The course challenges students to explore different ways of knowing, to be aware of subjective and ideological biases and to develop the ability to analyze evidence that is expressed in rational argument. (p.5)
- Creativity, action, service (CAS) – the community service component requiring 150 project hours and intended to “foster responsible, compassionate citizens. The CAS programme encourages students to share their energy and special talents with others. Students may, for example, participate in theatre or musical productions, sports and community service activities. Students should, through these activities, develop greater awareness of themselves, concern for others, and the ability to work cooperatively with other people. (p.7)

- Extended Essay of 4,000 words - Each student has the opportunity to investigate a topic of special interest from the pedagogical perspective of a field practitioner. The 4000 word essay requirement acquaints diploma candidates with the kind of independent research and writing skills expected by universities. (p.5)

Figure 1 depicts the IB subject and component design in the Hexagonal Curriculum Model.

Figure 2.1

The International Baccalaureate Hexagonal Curriculum Model



Schools have the option of offering certificates for successful completion of individual IB courses. IB teachers design curriculum defined by international standards with flexibility to comply with national and state standards, many of which are waived by states such as Virginia (Virginia Department of Education, 2003), that recognize the quality of IB courses.

Internationalism

As a result of the catastrophic events of September 11, 2001, the US Department of Education is experiencing a shift towards a more international perspective. Federal efforts to reform education include the incorporation of an international component already basic to the character of the International Baccalaureate. Secretary of Education Rod Paige's words (2002) present an avenue of opportunity on a national scope for the international program.

No longer can we afford to focus only on the domestic. Our view must turn more outward toward the world, nurturing our relationships with other countries and improving international studies in our schools... [W]e are ever mindful of the lessons of September 11th that taught us that all future measures of a rigorous K-12 education must include a solid grounding in other cultures, other languages, and other histories. (para. 9 & 18)

The international approach in course content and structure, in standards, and in assessments is a major factor that distinguishes the IB from other advanced academic programs.

The program structure infuses internationalism into the study of literature, integrates the study of international cultures across all disciplines, and establishes the international assumption that all students will be bilingual. End-of-course examinations are designed and assessed internationally using the same standards for students in 113 countries. In addition, internal assessments are administered and evaluated by teachers within each school (The College Board & The IBO, 2002).

Although the IBO stresses that International Baccalaureate is appropriate for highly motivated students of average ability and above, its international approach to education is especially attractive to high ability and gifted students (Walker, 2002). The international perspective results in a program structure that correlates to recommended practices for advanced

educational opportunities for gifted and high ability learners. Van Tassel Baska (1993, 2003) and other gifted educators make this recommendation due to the IB Program's course design structure that allows for differentiated curriculum, assessments, and other aspects that meet the needs of gifted students for rigor and challenge (Feldhusen, VanTassel-Baska, & Seeley 1989; Matthews, 2002a; Nugent & Karnes, 2002; Renzulli, 1997; Speed & Appleyard, 1985).

The multiple and varied assessments and the international standards are viewed as hallmarks of the program insuring against dilution of program rigor and quality. These program components are appropriate for all students who are increasingly expected to compete beyond a national level and for the nation as it focuses on internationalism and school-wide reform (Phillips, 2002).

The Implementation of the IB for School-wide reform

Overview of School-wide Reform

State and federal governments have responded to the need for school-wide reform by legislating reform based on standards-based assessments. The Commonwealth of Virginia implemented the Standards of Learning (SOL) standards-based assessment program in 1995, issuing a School Report Card rating public schools on student achievement and other criterion (Virginia Board of Education, 2003). The federal government's *No Child Left Behind Act of 2001* requires standards-based assessments and a quality teacher in every classroom. As a means of improving academic quality and rigor, the NCLB includes strong recommendations for school districts to increase the numbers of and enrollment in advanced placement programs.

Opponents of the standards-based assessment reform movement take the position that education should focus on teacher-centered reform rather than on student performance on standardized assessments (Cohen, 2002; McGhan, 2002). Amrein and Berliner (2002) reinforced

this perspective with research indicating that high-stakes tests did not increase student achievement and that the Advanced Placement Program with end-of-course examinations did not increase the numbers of students attending college in the time period from 1995-2000.

Additional research indicated to the contrary, reinforcing the reliability of using scores on end-of-course examinations in rigorous high school coursework as predictors of college success, influencing college acceptance and award of college credit (The College Board, 1997). Student achievement increased significantly in nations, states, and Canadian provinces with curriculum-based external exit exams (Bishop, 1998). In fact, the best indicator of success in college was found to be a student's participation in rigorous high school coursework with end-of-course exams. Students with advanced high school coursework had higher Grade Point Averages (GPA) in college and were more likely to earn their postsecondary degrees (Adelman, 1999; Wharburton, Bugarin, & Nunez, 2001).

School-wide Reform and the International Baccalaureate

College admissions data. Although empirical research on IB Program effectiveness is limited, college and university admissions data from 1987 through 2002 provide evidence of the success of the International Baccalaureate Program's standards-based assessment design. Consistently higher GPA's, higher grades in advanced university coursework, and increased graduation rates are found among IB students than for students who took regular high school college preparation or AP coursework. Admissions data of IB students performing at this level of achievement have been reported by The College of William and Mary, The University of Florida, Virginia Polytechnic Institute and State University, and the University of Tulsa. Not only did IB students enter college with higher levels of performance than other students but their performance continued to surpass that of other students throughout their four years in college

(Scaturro & Campbell, 2003). In addition to admissions data on exceptional achievement in college coursework, IB students had high university graduation rates and significant correlation between their college major and their choice of career (Duevel, 1999). The IB data replicate the national research findings of Adelman (1999) indicating high levels of university achievement by students who took advanced high school coursework.

Virginia School Reform. A 2002 Virginia study on the effectiveness of school reform stated that increased student achievement on Virginia Standards of Learning (SOL) exams coincided with several factors, including increased enrollment in IB Programs. During the timeframe from 1995 to the SOL test administration in 2002, student achievement steadily increased as did the numbers of students enrolled in IB since the beginning of the state program. The study on the effectiveness of SOL reform revealed that IB course enrollment increased from 369 in the 1997-1998 school year to 1008 in 2002-2003 and award of IB Diplomas increased from 132 to 567 during the same time frame (Standards Work, Inc. 2003).

National Research Council Recommendations. A third study by the National Research Council (Gollub, Bertenthal, Labov, & Curtis, 2002) of IB and AP programs gave the programs mixed reviews, praising the academic challenge of the IB and recommending that more students take advantage of their rigorous courses. However, the report questioned several aspects of the program, including whether it incorporated teaching and learning theory into its program design and its staff development, criticism that the IB Organization (IBO) has since addressed through redesign of teacher development practices.

National Attention. Criticism has been minimal, however, with the preponderance of opinion recognizing the IB Program as a vehicle for education reform. Jay Matthews, *Newsweek* and *Washington Post* columnist (2002a, 2003a) heralded the increase in the numbers of IB

programs and examinations, recommending increased access for other than gifted and high ability students. Mandates of the No Child Left Behind Act (NCLB) (2001) also advocate promoting access to advanced programs and examinations for students other than high ability and gifted learners in Section G – Advanced Placement Programs, titled “Access to High Standards Act.” Sharon Stevens of the NCLB Resource Center, stated the term “advanced placement programs” is generic and supports International Baccalaureate programs and examinations (personal communication, January 21, 2003). Criteria for quality in the NCLB also specify a requirement for a qualified teacher in every classroom.

Effective Teaching in General Education

Teaching may be compared to selling commodities. No one can sell unless someone buys. We should ridicule a merchant who said that he had sold a great many goods although no one had bought any. But perhaps there are teachers who think they have done a good day's teaching irrespective of what pupils have learned. John Dewey

Stronge's Effectiveness Teaching Model

Several decades of significant effectiveness research were synthesized in a seminal book, *Qualities of Effective Teachers* (Stronge, 2002), to develop a comprehensive profile of teacher behaviors and other effectiveness factors in a general education setting. Only proximal variables within the control and influence of the teacher were considered – those of “preparation, personality, and practice” (p.4). Although variables, such as student demographics and administrative policies, affect student achievement, they are outside of the teacher’s locus of control and were not considered. Stronge’s consequent Model of Effective Teaching captures the concept of effective teaching and, therefore, serves as the framework for this study. This paper will seek to align the Model of Effective Teaching in the general education setting with research

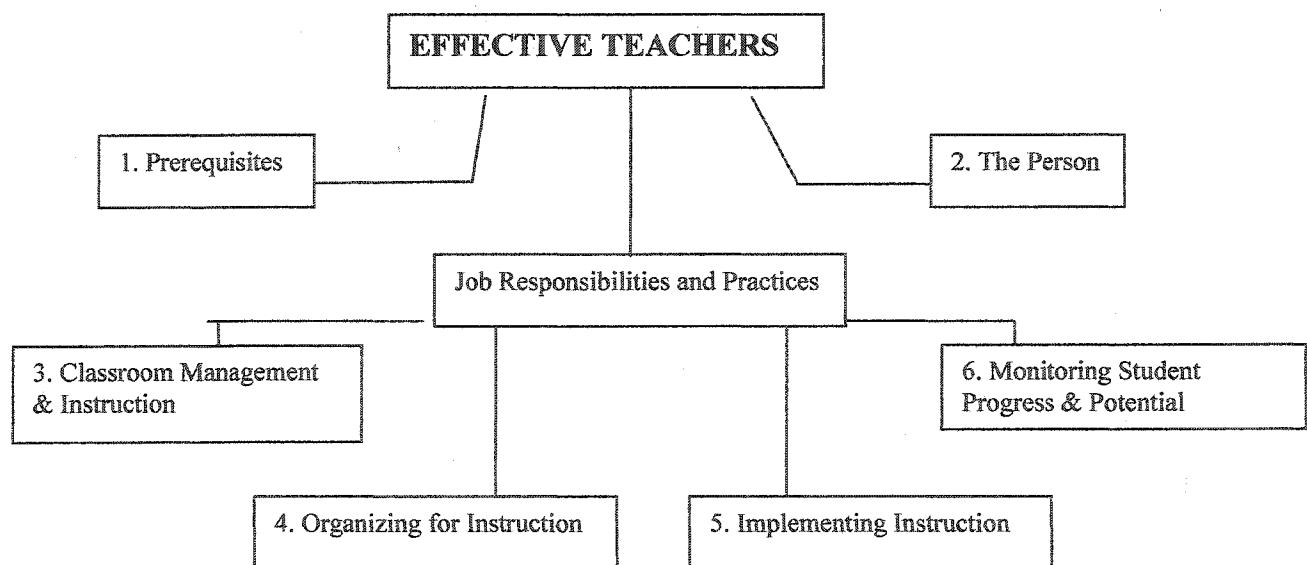
on teaching of gifted/high ability students and in the International Baccalaureate program.

Although all six domains of the model will be examined as a framework for effective teaching in advanced education, specific characteristics of the domains will be emphasized. In particular, the construct of teacher-efficacy from Domain 2, as defined by Tschannen-Moran, Hoy, and Hoy (1998), questioning from Domain 5, and particular instructional skill behaviors from the model will be studied in general education, gifted, and IB settings for their implementation as teacher effectiveness factors. Stronge synthesized the effectiveness data into the following domains:

- Prerequisites of Effective Teaching
- The Teacher as a Person
- Classroom Management and Organization
- Organizing and Orienting for Instruction
- Implementing Instruction
- Monitoring Student Progress and Potential

Figure 2.2

The Six Domains of Effective Teaching



A summary of Stronge's research in each of the domains initiates the examination of effective teaching in the gifted and International Baccalaureate settings. The existing research for each domain is organized by Dr. Stronge into characteristics of categories. The research presented in this paper is presented in a figure, titled Domain Categories, below the summary of each domain to be referenced in the proceeding literature reviews for the other two settings.

Domain 1: Prerequisites of Teaching

Teacher preparation is an ongoing process that begins before the teacher enters the classroom and continues throughout the educator's career. Although the first hurdle required for the qualified teacher by the *No Child Left Behind Act* (2001) is obtaining certification and licensure, research is contradictory in its treatment of the efficacy of licensure and certification as it relates to student achievement. Goldhaber and Brewer (2000) found no evidence to support the belief that standard certified teachers outperformed those teachers with emergency certifications. Alternative approaches to certification were proposed as well as recommendations to eliminate teacher certification requirements altogether. However, additional research indicated a correlation between higher student achievement on math and reading assessments and teacher certification and degree in the teaching field. Knowledge of content and pedagogy, along with years of teaching experience, were additional major prerequisites positively affecting student performance (Darling-Hammond, 2000; Darling-Hammond, Berry & Thoreson, 2001; Ferguson & Womack, 1993; Fetler, 1999). Teachers with knowledge of and preparation in content fields were more effective, particularly if those fields were mathematics and science (Blair, 2000; Ferguson & Womack, 1993). Although general intelligence was not shown to have a significant effect on student achievement, a teacher's verbal ability did positively impact student performance (Darling-Hammond, 2000; Rowan, Chiang, & Miller, 1997; Wenglensky, 2000).

Figure 2.3

Key References Domain 1: Prerequisites of Effective Teaching

Key References	Ability	Knowledge of Teaching & Learning	Certification Status	Content Knowledge	Teaching Experience
Blair, 2000		•		•	
Darling-Hammond, 2000	•	•	•	•	•
Darling-Hammond, Berry & Thoreson, 2001			•	•	
Ferguson & Womack, 1993		•		•	
Fetler, 1999		•	•	•	•
Goldhaber & Brewer, 2000			•	•	
Rowan, Chiang, & Miller, 1997	•				
Wenglensky, 2000	•	•			•

Adapted from Stronge (2002)

Domain 2: The Teacher as a Person

"We remember the human beings and their passion or energy. The texts and techniques are secondary" (Cohen, 2002, p.534)

The person of the teacher is as important to learning as is the teacher's content and pedagogical expertise. When surveyed to determine perceptions of the characteristics of good teachers, students invariably emphasized affective rather than professional qualities. A sense of humor and taking time to help students were qualities discussed in a survey of approximately 1000 high school students (NASSP, 1997). When adults reflected on their best teachers, they also indicated the importance of personal characteristics. Responses from teachers and other adults noted important factors to be exhibiting an authentic attitude of love and caring for children, being trustworthy and showing persistence, acting with fairness and compassion, and having a sense of humor (Bain & Jacobs, 1990; Peart & Campbell, 1999). The teacher who created a warm and supportive classroom environment while maintaining the proper teacher-student relationship was seen to enable every student to achieve (Brookhart & Loadman, 1992;

Cotton, 2000; Johnson, 1997). In addition, enthusiasm and motivation for learning were vital factors for teachers as well as for students; in fact, a teacher's motivation and enthusiasm for learning engendered similar responses from students (Bain & Jacobs, 1990; Marzano, Pickering, & McTighe, 1993; Rowan, Chiang, & Miller, 1997). While creating a positive person-centered atmosphere, the effective teacher emphasized personal responsibility for student outcomes. The teacher accepted responsibility for student learning without attributing blame elsewhere, and held the student to the same standard of accepting responsibility for personal learning (Bain & Jacobs, 1990; Thomas & Montgomery, 1998).

An often neglected factor is continuous reflective practice. Teachers, absorbed in the demands of the profession, seldom engage in or are taught to engage in self or collective reflection on their own and other teachers' instructional behaviors (Good & Brophy, 1997). Self-reflection and collective peer reflection enable professionals to identify unproductive personal assumptions and, thereby, monitor and modify their teaching behaviors (National Board Professional Teaching Standards, nd; Reagan, Case, & Brubacher, 2000). Confidence to engage in critical introspection translates into confidence in one's ability to facilitate student learning and is concomitant with enhanced teacher efficacy (Good & Brophy, 1997; Thomas & Montgomery, 1998). As a major focus of this paper, teacher-efficacy will be further discussed in Domain 2 in the section on Effective Teaching in Gifted Education.

Teacher perceptions of teaching ability and support are as significant to teaching effectiveness as are the teacher's specific abilities. Tschannen-Moran, Hoy and Hoy (1998) state that "teacher efficacy will be determined, in part, by the individual's comparative judgment of whether his or her current abilities and strategies are adequate for the teaching task in question" (p.233). The teacher's judgment of his or her strengths and weaknesses is more powerful than the

actual strengths and weaknesses possessed by the teacher (Bandura, 1997). Teacher's sense of efficacy, an important construct affecting student achievement, will be discussed in greater depth later in this chapter.

Figure 2.4
Key References Domain 2: The Teacher As a Person

Key References	Caring	Fairness & Respect	Interactions with Students	Enthusiasm & Motivation	Dedication to Teaching	Reflective Practice
Bain & Jacobs, 1990	•		•	•	•	
Brookhart & Loadman, 1992			•		•	
Cotton, 2000	•	•	•			
Good & Brophy, 1997	•	•	•			•
Johnson, 1997	•		•	•		
Marzano, Pickering, & McTighe, 1993				•		
NASSP, 1997	•	•	•			
NBPTS, no date					•	
Peart & Campbell, 1999	•	•	•	•		
Reagan, Case, & Brubacher, 2000						•
Rowan, Chiang, & Miller 1997						
Thomas & Montgomery, 1998	•	•	•		•	
Tschannen-Moran, Hoy & Hoy 1998						•

Adapted from Stronge (2002)

Domain 3: Classroom Management and Organization

The classroom environment either is conducive to or inhibits learning. The effective teacher realizes the importance of creating a positive learning environment that is also flexible enough to accommodate the needs of diverse students (Johnson, 1997; Peart & Campbell, 1999). The establishment of rules and procedures to conduct routine classroom responsibilities, preparation of materials, and flexible organization of space require a teacher to be adept at multi-tasking (Bain & Jacobs, 1990; Covino & Iwanicki, 1996; Emmer, Evertson, & Anderson, 1980). Effective teachers are proactive in handling minor disruptions before they become major ones. They know the importance of maximizing contact time with students to monitor student behavior

(Emmer, Evertson, & Anderson, 1980); yet, they also are able to maximize instructional time and student engagement in activities that provide both challenge and variety (Cotton, K. 2000; Good & Brophy, 1997; Wang, Haertel, & Walberg, 1993a, 1993b).

Figure 2.5
Key References Domain 3: Classroom Management and Organization

Key References	Classroom Management	Organization	Behavioral Expectations & Responses
Bain & Jacobs, 1990	•	•	•
Cotton, 2000	•	•	•
Covino & Iwanicki, 1996	•	•	•
Emmer, Evertson, & Anderson, 1980	•	•	•
Good & Brophy, 1997	•		•
Johnson, 1997	•		
Peart & Campbell, 1999	•		
Wang, Haertel, & Walberg, 1993a, 1993b	•	•	

Adapted from Stronge (2002)

Domain 4: Organizing for Instruction

The care and consideration a teacher exerts in planning for instruction are as valuable to learning as is the act of teaching. It entails a conscious and consistent focus on teaching and learning in the priorities they set for the allocation of time and expectations for students (Bain & Jacobs, 1990; Berliner & Rosenshine, 1977; Borich, 2000). Efficient use of time is enhanced by having materials prepared and ready to use, transitioning smoothly from one activity to the next, and maintaining a steady pace within lessons (Borich, 2000; Covino & Iwanicki, 1996; Wang, Haertel, & Walberg, 1993a, 1993b). The pace and momentum convey a clear message that the focus is on instruction and that students are expected to be actively engaged and learning.

Effective teachers clearly express high expectations for student achievement and emphasize that students are responsible and accountable for their learning (Cawelti, 1999a,

1999b, Tschannen-Moran, Hoy & Hoy, 1998). Students are more likely to be successful with this responsibility when learning objectives, questions, instructional strategies and activities are clearly and systematically defined and aligned. Connecting information to prior knowledge and linking it to real world experiences enables students to identify misconceptions and find relevance in learning (Bain & Jacobs, 1990; Cotton, 1999, 2000; Johnson, 1997; Marzano, Pickering, & McTighe, 1993).

Figure 2.6
Key References Domain 4: Organizing for Instruction

Key References:	Importance of Instruction	Time Allocation	Teacher Expectations	Planning for Instruction
Bain & Jacobs, 1990	•	•		•
Berliner & Rosenshine, 1999	•	•		
Borich, 2000		•		
Cawelti, 1999a	•	•	•	
Cawelti, 1999b	•	•	•	
Cotton, 1999	•	•	•	
Cotton, 2000	•	•	•	
Covino & Iwanicki, 1996	•	•	•	
Johnson, 1997			•	•
Marzano, Pickering, & McTighe, 1993				•
Tschannen-Moran, Hoy & Hoy, 1998			•	
Wang, Haertel, & Walberg, 1993a	•	•	•	
Wang, Haertel, & Walberg, 1993b	•	•	•	

Adapted from Stronge (2002)

Domain 5: Implementing Instruction

Delineating a single list of instructional strategies that applies to all populations in all settings is futile at best and damaging to students at worst. To be effective teachers need a repertoire of instructional skills that meet the contextual diversity of the profession and are designed to complexity level and content (Johnson, 1997; Peart & Campbell, 1999; Wang,

Haertel, & Walberg, 1993a, 1993b). The repertoire of instructional skills as described by Stronge involve instructional differentiation, instructional focus on learning, instructional clarity, instructional complexity, expectations for student learning, and use of technology.

Teachers often resort to the traditional information delivery model of lecture; however, research indicates the significantly greater effect of hands on activities, other action activities, and differentiated activities that promote higher level thinking and individual and group learning. Lecture can be effective when it is incorporated as one element in the strategy of direct instruction that also includes guided and independent practice (Bain & Jacobs, 1990; Blair, 2000; Wang, Haertel, & Walberg, 1993a, 1993 b; Wenglensky, 2000).

Effective instruction necessitates clear communication of content and expectations of student achievement at high levels well beyond rote learning. Students who engage in metacognitive behaviors monitor and modify their own learning practices (Rosenshine & Stevens, 1986; Wang, Haertel, & Walberg, 1993a, 1993b) and, as a result, learn to learn at higher cognitive levels. Effective teachers stretch students beyond their comfort levels by insisting on demonstration of understanding and by focusing instruction on meaningful conceptualization (Borich, 2000; Good & Brophy, 1997; Marzano, Pickering, & McTighe, 1993). Although questioning is a major strategy of effective teachers, research is inconclusive about the efficacy of higher-level versus lower-level questioning. Questioning is a key to learning in many settings because it serves to check for student understanding, increase student engagement, and probe student thought processes. Effective questioning requires effective preparation, sequencing, and coordination of the complexity level to the content (Berliner & Rosenshine, 1977; Cawelti, 1999a; Wang, Haertel, & Walberg, 1993a, 1993b).

Figure 2.7
Key References Domain 5: Implementing Instruction

Key References	Instructional Strategies	Content & Expectations	Complexity	Questioning	Student Engagement
Bain & Jacobs, 1990	•	•			
Berliner & Rosenshine, 1977		•	•	•	
Blair, 2000	•	•	•		
Borich, 2000					•
Good & Brophy, 1997			•		•
Marzano, Pickering, & McTighe, 1993	•		•		
Peart & Campbell, 1999	•	•			
Rosenshine & Stevens, 1986	•	•		•	
Wang, Haertel, & Walberg, 1993a, 1993b		•		•	•
Wenglensky, 2000	•		•		

Adapted from Stronge (2002)

Domain 6: Monitoring Student Progress and Potential

A further area of focus, the assessment practices used to monitor student progress, will be discussed in this section and in the section on Effective Teaching in Gifted Education. The standards based assessment movement has colored the practice of testing and teaching by focusing instruction on summative examinations rather than on process and formative assessments. Both are vital monitoring components of instructional and assessment practices.

Assessment skills. Effective monitoring of student learning occurs during the entire teaching and learning process when teachers employ a variety of assessment skills that include targeting questioning to lesson objectives, providing clear and timely verbal and written feedback, and identifying misconceptions to determine the areas in need of re-teaching (Berliner & Rosenshine, 1977; Peart & Campbell, 1999; Wang, Haertel, & Walberg, 1993a, 1993b).

Homework is a major means of monitoring student progress and affecting student achievement if its intent is to prepare for the next lesson, provide practice in, or provide

opportunity for elaboration of content. Conveying a clear purpose for homework, defining the amount to be assigned, conveying clear expectations for conducting and completing homework and consequences for failure to complete it make the exercise a productive rather than a meaningless, busywork activity (Cawelti, 1999a; Marzano, Pickering, & Pollock, 2001; Wenglensky, 2000). An important factor in appropriate assessment is differentiation. Designing assessments and instruction, setting expectations for and monitoring students according to their differences enables all students to be successful learners (Bain & Jacobs, 1990; Covino & Iwanicki, 1996; Kulik & Kulik, 1992).

Figure 2.8

Key References Domain 6: Monitoring Student Progress and Potential

Key References	Homework	Monitoring Student Progress	Responding to Student Needs & Abilities
Bain & Jacobs, 1990			•
Berliner & Rosenshine, 1977		•	
Cawelti, 1999a	•	•	•
Covino & Iwanicki, 1996	•	•	•
Kulik & Kulik, 1992			•
Marzano, Pickering, & Pollock, 2001	•	•	
Peart & Campbell, 1999		•	
Wang, Haertel, & Walberg, 1993a, 1993b		•	•
Wenglensky, 2000	•	•	•

Adapted from Stronge (2002)

The key references discussed in this section of the paper are organized into the Six Domains of the Effectiveness Teaching Model, according to the information and findings indicated by the research. The Key References for The Qualities of Effective Teachers are presented in Figure 2.9.

Figure 2.9
Key References: Qualities of Effective Teaching

Key References	Prerequisites of Teaching	Teacher as a Person	Classroom Management & Organization	Organizing for Instruction	Implementing Instruction	Monitoring Student Progress & Potential
Bain & Jacobs, 1990		•	•	•	•	•
Berliner & Rosenshine, 1977				•	•	•
Berliner, 1986	•		•			
Blair, 2000	•				•	
Borich, 2000				•	•	•
Brookhart & Loadman, 1992	•	•		•	•	•
Cawelti, 1999a				•	•	•
Cawelti, 1999b		•		•	•	•
Cotton, 1999		•	•	•	•	•
Cotton, 2000		•	•	•	•	•
Covino & Iwanicki, 1996		•	•	•	•	•
Darling-Hammond, 2000	•	•		•	•	•
Darling-Hammond, Berry & Thoreson, 2001	•					
Emmer, Evertson, & Anderson, 1980		•	•	•	•	
Ferguson & Womack, 1993	•					
Fetler, 1999	•					
Goldhaber & Brewer, 2000	•	•				
Good & Brophy, 1997		•	•	•	•	
Johnson, 1997	•	•	•	•	•	•
Kulik & Kulik, 1992						•
Marzano, Pickering, & McTighe, 1993		•		•	•	
Marzano, Pickering, & Pollock, 2001						•
NASSP, 1997	•	•			•	
NBPTS, no date	•	•				
Peart & Campbell, 1999	•	•	•	•	•	•
Reagan, Case, & Brubacher, 2000		•				
Rosenshine & Stevens, 1986					•	•
Rowan, Chiang, & Miller, 1997	•	•				
Thomas & Montgomery, 1998		•				
Tschannen-Moran, Hoy & Hoy, 1998				•		
Wang, Haertel, & Walberg, 1993a		•	•	•	•	•
Wang, Haertel, & Walberg, 1993b		•	•	•	•	•
Wenglensky, 2000	•				•	•

Adapted from Stronge (2002)

Effective Teaching in Gifted Education

A great deal has been written about appropriate instruction for gifted and high ability learners. Unfortunately, programs for this population are often considered elitist rather than being appreciated for providing a valuable educational service for a specific population of learners. The misconception extends to the individual student as well. With the pressure to have high achievement on high stakes testing for all students, teachers often neglect gifted and high ability learners, using the rationale that these students will learn regardless of instruction. A large body of literature and research on best practices for gifted education debunks both myths by providing data on recommended practices and behaviors that work for enabling these students to achieve to maximum potential. These recommended instructional practices and teacher behaviors will be examined within the context of Stronge's 6 Domains of Effective Teachers.

Stronge's Effectiveness Teaching Model

Domain 1: Prerequisites of Effective Teaching

Referring to research conducted on an education model designed specifically for gifted and high ability learners, VanTassel-Baska, Zuo, Avery, and Little (2002) noted, "The assumption that gifted learners develop to higher levels on their own without purposeful stimuli is clearly challenged by these results" (p. 41). One of the effectiveness factors stressed in gifted research is the need for pre-service and in-service opportunities to train teachers in the implementation of programs for gifted, in the characteristics of gifted children, and in gifted pedagogy that produces high achievement among this population.

However, not only is tracking of gifted students uncommon practice, but implementation of strategies for gifted students and an understanding of the changing roles of teachers are seldom understood or practiced (Gentry, Rizza, & Owen, 2002; Dubner, 1979). A study of 46

third and fourth grade mixed ability classrooms found that 84% of the time teachers did not differentiate their instructional activities and curricular materials for gifted. Teachers placed gifted students in heterogeneous groups 79% of the time, thereby, arranging for homogenous gifted groupings only 21% of the time (Westberg, Archambeault, Dobyms, and Salvin, 1993). When pre-service and ongoing teacher training in the different needs of and instructional strategies for gifted and high ability is provided, student learning gains are realized. Teachers who experienced two years of ongoing professional development successfully integrated differentiation strategies for gifted students in the general education classroom (Johnsen, Haensley, Ryser, & Ford, 2002).

Faced with the reality that focused professional development in gifted instruction is not the norm, curriculum models have been specifically designed to insure learning in a context particularly appropriate for gifted and high ability learners, such as Renzulli and Reiss' Schoolwide Enrichment Model (SEM) and The College of William and Mary's Integrated Curriculum Model (ICM). Both programs provide extensive information and training on program design, appropriate instructional strategies, and on the characteristics of the gifted mind to schools at implementation (Renzulli & Reiss, 1985; VanTassel-Baska, Zuo, Avery, & Little, 2002). Research on implementation of the language arts component of the ICM indicated significant learning gains for gifted students, but the study underscores the necessity of training to achieve these results (VanTassel-Baska, Zuo, Avery, & Little, 2002).

Not only do gifted children often experience inadequate teaching but the types and expressions of their intelligence often remain unidentified. Case studies of 35 fifth and sixth grade high ability children, attributed underachievement and failure to several academic and non-academic factors. The instructional factors highlighted inadequate in-service and pre-service

training in the characteristics of, special needs of, and various methodologies appropriate for these children. (Lee-Corbin & Denicolo, 1998; Sternberg & Grigorenko, 2002). Appropriate educational practice mandates the debunking of the gifted stereotype that “Gifted students will learn anyway” (Callahan, 2001).

The traditional academic pace of the classroom and instructional practices that award A’s for very little effort teach mental laziness and negative attitudes towards learning (Agne, 2001). Vygotsky’s Theory of Proximal Development proposes that human beings learn best when they are stretched beyond their comfort zones (Vygotsky, 1978). In order to avoid teaching lack of motivation, academic complacency, and cynicism, attending to theories of teaching and learning will alert teachers to the importance of active engagement and challenge for gifted learners (Kapusnick & Hauslein, 2001).

Research on the benefits of teaching experience and college courses on gifted found that both qualifications translated into more accurate perceptions of gifted learning behaviors. Teachers were more likely to interpret unusual behaviors correctly and were, therefore, less likely to feel threatened by excessive enthusiasm, aggressive learning behaviors, and the deep knowledge base of gifted learners (Heath, 1997; Agne, 2001; Rash & Miller, 2000). Five or more years of teaching experience also correlated to familiarity with and implementation of an increased variety of teaching models (Rash & Miller).

A case study of 10 elementary schools noted for their success with gifted found that the majority of teachers of gifted had earned graduate degrees. The majority of the graduate degrees were in the fields of special education and reading, fields that encourage differentiation and attention to the individual (Westberg & Archambeault, 1997). However, few states or school divisions require degrees, certification, or endorsement in gifted education, prompting gifted

educators to decry the lack of certification standards and to urge state and federal governments to legislate more stringent certification and endorsement requirements (Karnes, Stephens, & Whorten, 2000).

Numerous researchers noted the importance of the teacher's intellectual ability level (Silverman, 1995; Agne, 2001; Dubner, 1979; & VanTassel-Baska, 1993), metacognitive processes (Henderson, 1996 & VanTassel-Baska, 1993), and psychological and intellectual readiness (Westberg & Archambeault, 1997) as factors related to the tendency to make the changes learned through professional development and education. Similar to findings in general education research on verbal skills, successful teachers of gifted were found to earn high scores on verbal ability skills tests. Although general education research does not indicate a correlation, gifted experts emphasize the importance of above average intelligence in teachers of gifted for teaching students of above average intelligence (Silverman, 1995). In surveys of gifted experts and gifted students the characteristics stressed were high achievement motivation, strong communication skills, intellectually curiosity, and high intelligence (Heath, 1997; Nikakis, 2002).

Domain 2: The Teacher as a Person

The quality of the teacher/student relationship is a multi-faceted factor affecting student learning. As a major focus of this paper, teacher-efficacy, a characteristic of Domain 2, will be examined carefully in this section on gifted education.

Gifted students view the effective teacher as one who exhibits an accepting attitude of warmth and respect and who relates to them personally (Carper, 2002; Heath, 1997; Nikakis, 2002). The effective teacher risks self-revelation by revealing personal information to individual

students in informal classroom discussion. This self-revelatory relationship between student and teacher is described as one of equality (Silverman, 1995) or mutuality (Heath, 1997).

Of vital concern to the field of gifted education is the gifted student characterized by underachieving and failing conditions. The teacher's reflection on student behavior, classroom responses, and interactions with the student would alert the teacher to reorient approaches to problematic gifted students (Carper, 2002).

A comparison of teacher and student perceptions of teacher behaviors revealed that teacher perceptions often did not reflect student perceptions of teacher behaviors regarding challenge and choice. Students in middle school and elementary school classrooms reported fewer opportunities for challenge and choice than did their teachers. However, significantly greater opportunities for choice were reported by gifted magnet school students (Gentry, Rizza, & Owen, 2002). These findings underscore the importance for effective teachers to have accurate self perception and personal awareness of their teaching behaviors. Training and support enable the teacher to develop a clear vision for change and reinforce teacher confidence to make change (Johnsen & Haensley, Ryser, & Ford, 2002).

The teacher who enjoys teaching gifted is flexible enough to meet the needs of gifted (Heath, 1997). The behavior exhibited by the teacher of a positive attitude towards learning and emotional sensitivity towards students serves as a role model for students in gifted programs that intend to develop students' intellectual curiosity and love for learning (Hansford, 1985). Additionally, the teacher's metacognitive processes about the immutability of intelligence (Ross, 1998), the teacher's attitude toward learning and the value of gifted methodologies determine the teacher's approach to and success with the teaching task (VanTassel-Baska, 1993; VanTassel-Baska & Little, 2003). The person with a secure sense of self accepts the aggressive behavior of

gifted students who often possess and express higher specialized knowledge bases than do their teachers (Haensley, 2001; Kapusnick & Hauslein, 2001; VanTassel-Baska & Little, 2003). Intuitive and receptive, these educators exhibit a high level of comfort with student's aggressive and energetic learning behaviors, often responding with a sense of humor rather than defensiveness (Silverman, 1995). A student's desire to add his or her knowledge to the teacher's knowledge is not perceived by the effective teacher as a threat (Agne, 2001; VanTassel-Baska & Little, 2003). This personal sense of security, often characterized by self-reflective practice (Heath, 1997; Thomas & Montgomery, 1998; Westberg & Archambeault, 1997), translates into high teacher efficacy.

Teacher-efficacy. The teacher-efficacy (T-E) theory used as a model for this investigation is the model designed by Tschannen-Moran, Hoy, and Hoy (1998). As a characteristic of Domain 2: The Teacher as a Person, the construct fits within the Stronge Effectiveness Teaching Model (2002). Although the construct of teacher-efficacy has different and broader dimensions, it is concomitant from Bandura's theory of self-efficacy (Ross, 1994b). Tschannen-Moran, Hoy, and Hoy refer to four major sources of self-efficacy from Bandura's theory that pertain to the teacher-efficacy construct:

1. *Mastery experiences.* The most powerful of the four sources, mastery experiences have the weight to countermand ability. The perception of success in past performance delineates the expectation of future success. Perception of past failure produces lower efficacy for future endeavors.
2. *Physiological or emotional cues.* The level of arousal either heightens attention to task or inhibits the ability to function and make use of skills and abilities.

3. *Vicarious experiences.* Observation of others increases or erodes efficacy beliefs. Observation of competent teachers who adeptly handle tasks builds efficacy and enhances belief that the challenge is manageable.
4. *Verbal Persuasion.* Information on the nature of teaching, information on new teaching strategies, and encouragement to attempt them builds confidence to try new ideas and approaches. However, unless the teacher experiences success in strategy implementation, personal teaching competence is not enhanced. Performance feedback has the potential to either enhance or decrease perceptions of teaching competence.

Information from the four sources is sifted through cognitive processes. This sifting process determines how the teacher interprets information and how the teacher attributes value or credibility to the information. The sifting ultimately allows the information to influence the two interrelated dimensions of the Teacher-Efficacy Model developed by Tschannen-Moran, Hoy, and Hoy – the teaching task and context and self-perception of teaching competence.

Personal strengths and weaknesses in both dimensions are analyzed by the teacher who balances the resultant judgments against one another. In an analysis of the *teaching task and context*, the teacher evaluates the relative importance of factors that constrain or inhibit teaching in relation to the teacher's assessment of the available resources conducive to learning. In the dimension of *self-perceptions of teaching competence* a teacher weighs personal capabilities against personal weaknesses in the teaching task at hand. Assessments about self-efficacy emanate from the interaction of the judgments formed in the analyses of the two dimensions.

Specific factors are associated with individuals with high levels of teacher-efficacy (Ross, 1994a). Those that are particularly relevant for teachers of high ability learners reveal the teacher who:

- believes that success or failure of his or her students is within the control of the teacher
- is willing to experiment with challenging teaching techniques
- is willing to implement innovative programs
- enhances mastery of cognitive goals

Teacher-efficacy beliefs have a significant effect on student success and failure.

Teachers with high levels of the construct attribute student success to the teacher and to the academic program. They accept responsibility for the student conditions of failure and success and tend to view unsuccessful students as challenges rather than as threats (Hall, et.al.1992; Ross, 1994a). Studies of the conditions of failure and low achievement in gifted and high ability students (Carper, 2002; Lee-Corbin & Denicolo, 1998) suggest the relevance of challenge versus threat perceptions to gifted education and programs.

Teacher efficacy is operationalized as teacher's perceptions of ability to perform tasks integral to student learning. The construct is a significant variable predictive of teaching effectiveness and student performance. Although a teacher may have sufficient knowledge of content and training in pedagogy, the teacher's judgment of his or her ability to perform the task at hand may be a more powerful determiner than the actual strengths and weaknesses possessed by the teacher (Hall, et.al., 1992; Ross, 1994a, 1994b, 1998; Tschannen-Moran, Hoy & Hoy, 1998). With this understanding of the power of teacher-efficacy to affect performance, it becomes clear why the construct is an important factor for consideration for advanced

educational opportunities. In fact, the relevance of teacher-efficacy is evidenced in the description of the gifted teacher as one who is secure enough personally to respond to the requirements of the gifted classroom (VanTassel-Baska, J. & Little, C.A., 2003).

Specific efficacy research is especially pertinent to advanced educational opportunities such as the IB. Higher levels of the teacher-efficacy construct are associated with well-behaved, high ability students, achievement of goals for higher student cognitive processing, and teacher motivation to implement challenging teaching strategies and innovative programs (Ross, 1994a). In a 1992 study of secondary education teachers by Raudenbush, Rowan, and Cheong (in Ross, Cousins, & Gadalla, 1996) teachers reported higher teacher-efficacy under these conditions:

- if teachers were well-prepared
- if classrooms had highly engaged students
- if students were of a higher ability and grade level.

The meta-analysis by Ross, Cousins, & Gadalla (1996) characterized higher T-E teachers as risk-takers, a term the researchers operationalized by several factors. Teacher risk-takers were more likely to experiment with teaching strategies that stretch student and teacher comfort levels and less likely to rely on traditional lecture and other teacher-centered approaches. They preferred performance based formative assessment to traditional pen and pencil tests and provoked higher levels of student engagement.

Research makes it clear that teacher-efficacy is vital to effective teaching of motivated students in innovative programs. The construct of high efficacy reflects the characterization of the effective teacher of gifted and high ability as one who is effective with content, pedagogy, and self (Maker & Nielsen, 1996). Its influence on a teachers' levels of effort and persistence

(Tschannen-Moran, Hoy, & Hoy, 1998), make teacher-efficacy a vital construct to examine in International Baccalaureate teachers.

Domain 3: Classroom Management and Organization

A review of gifted literature reveals that discussion in this domain focuses on the teacher's ability to manage discussions, multi-task, and organize the environment for differentiated learning. Responses to a student survey resulted in 13 categories characteristic of gifted teachers, one of which described the teacher as a supervisor/administrator who is able to "keep the class and course organized" (Dubner, 1979, p.145). Clearly defined behavioral expectations contribute to maintaining the organized environment (Nikakis, 2002). Additionally, it is vital to involve gifted students in the process of creating ground rules for class discussions and other procedures (Smutney, 2000).

The organization of the classroom is a vital component of effective high ability instruction. The gifted teacher's management style is characterized by the ability to multi-task and coordinate classroom procedures by creating an exciting, constant flow of stimulating opportunities and activities (Carnine, 1993; Carper, 2002; Maker & Neilsen, 1996; Johnson & Ryser, 1996; Stepanick, 1999). Giftedness and self-directed learning can be developed by designing an engaging, stimulating classroom environment, curriculum, activities, and assessments (Callahan, 2001; Lee-Corbin & Denicolo, 1998). The physical setting provides a variety of resources and learning areas to allow for formal and informal group interaction and activities relevant to student interests and experiences (Grant, 2002; Johnsen and Ryser, 1996; Johnson, Haensley, Ryser, & Ford, 2002; VanTassel-Baska & Little, 2003). The classroom should contain a variety of sensory stimuli – textures, materials, complex bulletin boards. However, classrooms are more often characterized by orderly rows and relatively bare walls

rather than the stimulating environment needed by these students (Maker & Nielson, 1996). It is noteworthy that teachers of gifted encounter fewer discipline problems, managing the classroom with less overt techniques such as humor (Silverman, 1995).

Domain 4: Organizing for Instruction

Literature discussing key factors for effective teaching of gifted and high ability notes the importance of pacing, maintaining high expectations, planning a variety of instructional approaches designed to fit student learning abilities and interests, and linking instruction to real life. In order to implement appropriate instruction, effective teaching of gifted requires thorough planning and organization. Students reported a preference for teachers who organized instruction and used time constructively from bell to bell (Heath, 1997; Silverman, 1995).

The imperative to multi-task requires careful organization, skill, and innovation to provide a constant flow of stimulating, differentiated activities in a classroom environment characterized by flexibility. The flexibility may take the form of pacing through acceleration, content modification, or curriculum compacting (Callahan, 2001; Silverman, 1990; Maker & Nielson, 1996; VanTassel-Baska & Little, 2003). Time essentially is fluid, determined by the type and flow of the task, the learning, and the end product (Renzulli, 1999).

Stepanick (1999) recommends planning interdisciplinary units with flexible pacing through curriculum compacting that allows students to work to their ability level. Curriculum and learning activities are designed to teach students at higher levels of abstraction and complexity (Carnine, 1993; Johnson & Ryser, 1996). Therefore, in the planning process the teacher analyzes concepts and skills to be learned and designs instruction accordingly. Content and process are organized to challenge high cognitive functioning and enable student discovery and experimentation, self-initiated learning (Speed & Appleyard, 1985; Torrance & Goff, 1990),

to emphasize problem-solving, interrelationships, independent and group investigations (Maker & Nielson), and concept development linking learning to real world situations (Carnine, 1993; Johnsen & Ryser, 1996, Renzulli, 1999). Effective teachers of gifted give meaningful assignments, activities, and instruction rather than busy work so resented by gifted students (Johnson, 2000; Maker & Nielson). Expectations of student and teacher responsibility for learning are basic motivators of gifted teachers as they organize opportunities for discovery learning and challenge (Agne, 2001; Lee-Corbin & Denicolo, 1998).

Domain V: Implementing Instruction

Instructional skills characteristic of Domain 5 will be examined with a particular emphasis on questioning. Effectiveness in Domain 5 requires instructional skills characterized by differentiated instructional strategies, instructional clarity, and increasing levels of complexity in a classroom that emphasizes the importance of learning by focusing on instruction. This approach to instruction fosters student engagement and effectively challenges gifted and high ability students to attain optimal achievement.

Although the common belief is that gifted children will learn without special instruction, differentiated instructional skills that include a range of targeted instructional strategies are vital to optimal achievement for the population (Callahan, 2001). Instruction that is student-centered and student-directed and that links instruction to real world experience is more likely to achieve the goal of developing independent thinkers and learners. The teacher is not the authority dispensing information, but prefers to employ a variety of stimulating, meaningful activities that involve students as active participants in the instructional process (Carnine, 1993; Renzulli, 1999). Direct teaching, however, a strategy which includes lecture in combination with guided and independent practice, is beneficial for gifted students within a particular context. Direct

teaching is most appropriate in promoting initial understanding of complex material and for teaching metacognitive and other thinking skills, but it is recommended that the approach be balanced with student-directed activities (VanTassel-Baska & Little, 2003).

Appropriate differentiated gifted instruction includes constructivist and discovery learning opportunities for students to construct their own learning through individual investigation and other inquiry activities (Carper, 2002; VanTassel-Baska & Little, 2003; Westberg & Archambeault, 1997). Theme and problem-focused content that includes a global perspective incorporates significant problem-based projects selected by students and facilitated by the teacher (Feldhusen, VanTassel-Baska & Seeley, 1989; VanTassel-Baska, 1993). Independent investigations can be successful and creative if the teacher explains the process and expectations with instructional clarity. Students enjoy and pursue learning that is relevant and relates to the real world; they do not prosper in a teacher-centered classroom characterized by lecture. Metacognitive processes are developed when activities include opportunities for student reflection on and evaluation of their thinking (Maker & Nielson, 1996; Stronge, 2002; VanTassel-Baska & Little, 2003). As a result, coverage of content may be sacrificed to allow time for such reflective and self-examining activities (Grant, 2002; Torrance & Goff, 1990).

Student engagement is linked to the effective teacher's facility in managing a range of strategies and levels of questioning so that student interest is peaked and student involvement is fostered. Gifted and high ability students function more optimally when they are actively engaged in their learning through a variety of instructional strategies (Renzulli, 1997). Effective teachers emphasize the importance of learning by maximizing learning time through monitoring the momentum and flow of instruction (Heath, 1997; Renzulli, 1999; Silverman, 1995). Silverman's study (1995) of questioning practices of teachers of advanced and gifted students

found that teacher practice of reflection of student responses increased student engagement with one another and in the discovery process. In a study of Advanced Placement (AP) teachers, Henderson (1996) found that effective teachers of advanced students implemented questioning practices that resulted in higher levels of student engagement and participation. Both studies are discussed more thoroughly below.

Teacher questioning skills. Questioning is a critical strategy characteristic of Domain 5: Implementing Instruction from Stronge's Effectiveness Teaching Model. Although research findings are contradictory, the act of questioning is often emphasized as a key to effective instruction and learning by general educators and gifted educators for general education classrooms and for advanced educational opportunities. For optimal outcomes from implementation of the strategy, the levels of complexity of questioning should reflect the levels of complexity of the content and the level of understanding of the student. Effective questioning is integral to effective instruction and learning and an essential quality of advanced education (Renzulli, 1999; Maker & Nielson, 1996; VanTassel-Baska & Little, 2003).

The data indicating that questioning takes 35-50% of classroom instructional time clarify the importance of appropriate use of the strategy (Cotton, 2000). Recommendations for appropriate questioning for general education include:

- a combination of lower-cognitive level and higher-cognitive level questions to monitor student understanding of content
- a combination of convergent and divergent questions
- fit of question level to objectives, grade level, and content
- more frequent higher-cognitive level questions in the upper grades
- increased wait time for student responses

- probing questions to stimulate thinking and metacognition (Cotton, 2000; Cruickshank, Bainer, & Metcalf, 1999; VanTassel-Baska & Little, 2003)

The discussion of levels of questioning refers to the levels of Bloom's Taxonomy of the Cognitive Domain. The levels in order of complexity from least to most complex are: knowledge or recall, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956; VanTassel-Baska, & Little, 2003).

Questioning at all levels of complexity is a component vital to achieving the goals of advanced education (Gubbins, 2003; Hansford, 1985). Lower-cognitive level questions begin the process by focusing students on content and assessing their learning at lower conceptual levels. Increasingly higher-cognitive level questions follow to probe student thought processes and to incite higher level thought processing. The effective teacher provokes students to go beyond their comfort zones by forcing them through questioning at higher levels of Bloom's Taxonomy to extend their ideas and justify their conclusions (Maker & Nielson, 1996; Renzulli, 1997; Silverman, 1996; VanTassel-Baska, 1993). The Socratic approach, a recommended vehicle for effective questioning, serves the multiple purpose of stimulating analysis of values and ideas, reflection, and creativity in thought (VanTassel-Baska & Little, 2003).

A case study by Westberg, Archambeault, et. al. (1993) of instructional practices for gifted students in 46 elementary school classrooms found that questioning practices for gifted and regular students in general education settings did not differ. Instead of higher level questioning and extended wait time for gifted and high ability students, teachers allowed less wait time after questions for targeted gifted students than for non gifted students. Questions were primarily recall and comprehension inquiries which are at lower cognitive levels of Blooms Taxonomy. The simple act of increasing normal wait time for students after questioning from 2

to 5 seconds allows for reflection at significantly higher cognitive levels (Maker & Nielson, 1996; Silverman, 1995).

However, different results were found in other research studies. Three studies will be examined, one examining questioning patterns for effective and non-effective teachers in general education classrooms and two studies examining practices of teachers in advanced and gifted classrooms.

Research on the total number of questions asked at the various levels of Bloom's Taxonomy was conducted on teachers classified as effective or ineffective based upon student performance. Although the number of lower-level questions asked was comparable for both groups, the major distinction was in the number of higher level questions asked. Notably more questions at the comprehension level of Bloom's Taxonomy were asked by ineffective teachers. Effective teachers asked questions at upper cognitive levels seven times more than did teachers categorized as ineffective (Stronge & Tucker, 2003).

Studies by Silverman (1995) and Henderson (1996) indicated positive patterns of questioning practiced by teachers of advanced and gifted students. Gifted teachers in Silverman's study were less likely to provide answers and immediate feedback to questions, more likely than non-gifted teachers to ask divergent rather than convergent questions, and were more likely to reflect student questions and exhibit non-judgmental responses to student answers and opinions in order to promote thought. This behavior resulted in increased student to student interaction and engagement in the discovery process.

In one of the few research studies on teachers of advanced programs the questioning practices of effective teachers of Advanced Placement (AP) students were compared with those of effective teachers of students in general education classrooms. The case study of AP

American History classrooms found effective teachers had higher expectations for students and were more likely to use feedback from assessments to structure lessons (Henderson, 1996).

Henderson's study (1996) found significant differences in four areas, indicating that effective teachers of advanced students:

1. asked more questions,
2. had higher levels of student engagement during questioning,
3. had greater participation rates during questioning,

Both groups, AP and general education teachers, made maximum use of instructional time, but questioning by AP teachers was more frequent, produced greater distribution of responses and higher rates of successful answers. Although these findings compare to findings for effective teachers of general education students, comparable studies do not exist for the IB Program; however, the AP Program's many similarities with the IB make this a relevant study for consideration for the purposes of the paper. Likewise it brings to the fore the need for study in the questioning practices of IB teachers.

Questioning is integral to the manner in which people learn; however, it is clear that correct questioning techniques require teacher expertise. Knowledge of content and of teaching and learning are backdrops for designing questioning (National Research Council, 2000). This body of knowledge enables teachers to serve gifted students more effectively by promulgating student investigation, developing higher level student thinking and behavior, and enabling teachers to generate and order questions that guide lessons.

Domain VI: Monitoring Student Progress and Potential

In addition to the three instructional skills from Domain 5, this paper will examine the assessment practices implemented by effective teachers to monitor student progress and

potential. To be able to maintain student enthusiasm for learning and to be aware of student learning, the effective teacher understands the value and practice of assessment as an ongoing process rather than as a discreet event.

Assessment skills. Assessment manifests itself daily in the form of feedback to reinforce and monitor learning. The frequent and varied forms of feedback and assessments (i.e. verbal questioning, essays, quizzes, creative products) make it a targeted and constructive process (Carnine, 1993; Maker & Neilson, 1996; VanTassel-Baska & Little, 2003). Rather than limiting assessment to summative practice, assessment is authentic and formative. The products of authentic assessment either reveal original thought or creative manipulation of existing knowledge (Johnsen & Ryser, 1996).

Products take various forms determined by the talents and interests of students (VanTassel-Baska & Little, 2003). The teacher involves students in the process from beginning to end by allowing them to select the form and presentation of their products (Maker & Neilson, 1996, Stepanick, 1999). Clearly stated criteria for evaluation measure the quality of the product but also assess the depth and complexity of the process. Effective teachers rely on multiple assessments designed according to how students learn and how they best express their learning.

Homework is an important component of gifted instruction. Due to the fluidity of the gifted approach to teaching and learning, it is often difficult to quantify what is homework and what is student-generated investigation. Appropriate assignments extend learning and are characterized by depth and complexity rather than by quantity (Feldhusen, VanTassel-Baska, & Seeley, 1989). Recommended practice for Advanced Placement students suggests that homework and testing be frequent to insure the rigor and challenge required of high level learners. (Henderson, 1996). Optimal benefits accrue to the student when teachers provide timely

feedback on homework through grading or other response mechanisms (Marzano, Pickering, & Pollard, 2000). Feedback also insures that the student does not consider it to be busy work (Maker & Neilson, 1996).

Providing appropriate feedback takes a skillful teacher who is able to differentiate between the appropriate timing for prompt responses to students and appropriate timing for postponement of responses to avoid risking the stifling of original thought. On the one hand, Silverman (1995) recommends that the effective teacher often takes a counselor's approach to feedback – a nonjudgmental reflection to delay feedback and, therefore, provoke discovery and student to student interaction. Carnine (1993), on the other hand, encourages frequent, constructive, targeted feedback to assessments that take many forms such as verbal questioning, essays, and artwork. The two approaches are not contradictory but characteristic of the effective teacher who intuits the appropriate time to implement each.

A case study of effective teachers in highly selective Advanced Placement (AP) classrooms compared their teaching practices with those of effective teachers in general education classrooms. Henderson (1996) found that effective teachers of AP American History had higher expectations for students and were more likely to use feedback from assessments to structure lessons than effective non-AP teachers. Although enrollment in many AP courses does not discriminate by ability level, the AP, like the IB, is considered to be an advanced educational opportunity. Since the cases were selected for study based on student success on AP exams, the study is relevant to this section of the study.

Unless gifted instruction and instructional programming are conducted according to recommended practice, gifted education will be ineffective. It is evident from the review of literature on effective teaching in the venues of general education and gifted education that the

practices align. Due to the differing characteristics of the population groups areas of emphasis differ in each of the six domains; however, appropriate and effective instruction for all students requires designing instruction to the particular needs of specific student populations.

Due to the integral roles of questioning and teacher-efficacy in both the general education setting and in the gifted education setting, questioning and teacher-efficacy will be discussed at length in separate contexts in subsequent sections of this paper.

Effective Teaching in the International Baccalaureate Program

“Students in the IB Program have taken on an academic challenge that is above and beyond the norm, and that is always interesting to us” (Freeman, 1987, p.5). These words by a Harvard Dean of Admissions commending the graduates of the International Baccalaureate Program are echoed by university officials across the nation. Increasing numbers of prestigious colleges and universities recognize the high skill level of IB graduates. However, the limited amount of research undergirding the efficacy of the program does not allow treatment of the data within the Stronge model. Therefore the literature will be presented in the formats of research data, recommended practices, and anecdotal evidence to assess the fit of program design, nature of teaching and learning, and desired program/student outcomes to the effectiveness research.

Research on International Baccalaureate Programs

Student Outcomes

The comparatively recent implementation of the International Baccalaureate Program in a significant number of high schools in the United States (IBO, 2003) has resulted in limited empirical data and no longitudinal data on program and teacher effectiveness. [The IB administered 172,000 examinations to 52,000 students in 2002 compared to 1,585,000 Advanced Placement examinations administered to 900,000 students (IBO & The College Board, 2002).]

However, college and university admissions data have been collected from 1987 through 2002. The data from several institutions reflected the findings of national research on the success of students in the IB Program, indicating exceptional college and university performance by students who took high school coursework in the Program. Consistently higher GPA's, higher grades in advanced university coursework, and increased graduation rates were found among IB students than for students who took other high school college preparation or AP coursework. Admissions data of IB students performing at this level of achievement has been reported by The College of William and Mary, The University of Florida, Virginia Polytechnic Institute and State University, and the University of Tulsa (Scaturro & Campbell, 2003).

Carson (1990) examined achievement data among students in attendance at Virginia Polytechnic Institute and State University in 1987. After four semesters 33% of non-IB students without AP credits, 41% of students who earned AP credits, and 88% of students from IB schools earned GPA's of 3.0 or higher (Carson, 1990). The study considered all graduates from IB schools and deliberately did not limit consideration to IB students only. The school held the belief that schools offering the IB program "were clearly committed to quality education" (p.1) that would positively affect all students.

University of Florida data from 1996-2002 indicated consistently higher academic performance from IB high school graduates than from graduates of all other high school programs. Higher percentages of IB students earned a grade of "B" or higher in upper level university coursework. In upper level introductory chemistry, 91.7% of IB students earned a B or higher while 58.3% of all students earned a B or higher (Kolb, 2002; Kolb & Eckhardt, 1999; Scaturro & Campbell, 2003). Similar performance was found at numerous institutions, including the College of William and Mary in Virginia (Jesse, 1999; Scaturro & Campbell, 2003) and the

University of Tulsa (Rick Arrington, personal communication, March 14, 2003) where IB students were the highest achievers in higher education as well as in high school.

Admissions data from The University of Tulsa prompted the school to actively recruit and to establish generous acceptance and credit policies for IB high school graduates. A study examined the achievement of 25 IB Diploma graduates who entered the university in 2002. After two semesters 5 of 23 freshmen had a GPA of 4.0; 11 had a GPA of 3.5 or higher; and only 2 had a GPA below 3.0. The average GPA of all first year students at the completion of their freshman year was 2.8; for IB students during the same time frame, it was 3.6. (Rick Arrington, personal communication, March 14, 2003). The gap in GPA's at all reporting universities was found to increase over four years of coursework (Jesse, 1999; Kolb, 2002; Scarturro & Campbell, 2002). In addition to admissions data, three studies, relevant to this paper, examined IB students and the IB Program. Research conducted worldwide by Duevel (1999) on IB graduates' satisfaction with the program indicated high university graduation rates for the population studied and a match between their chosen career and university major. Among IB survey respondents, 92% earned bachelor's degrees, 87% of them in five years or less; 54% attended graduate school; and 82% were employed in professions associated with their undergraduate majors. A majority of the respondents reported that their involvement in the IB favorably impacted their university performance. Figure 10 depicts the percentage of IB Diploma holders indicating favorable responses for each university level task.

Figure 2.10	
The IB's Perceived Affect on University Performance	
University Tasks	Percentage of Favorable Responses
Working independently	88%
Working cooperatively	65%
Organizing time	91%
Understanding complex assignments	91%

A recent study by Munro (2002) addressed the need to provide information on the quality of learning attained by IB students. In addition to successfully completing six IB subjects, IB Diploma students are required to write an Extended Essay in their senior year, a 4000 word paper on original research. The researcher proposed that success on the essay was influenced by the integration of three approaches to learning, two types of motivation, and two types of learning strategies. The three approaches to learning are the deep approach (in depth analysis), the achieving approach (align learning with evaluation criteria), and the surface approach (short term retention). Students are motivated extrinsically and intrinsically and select from global (synthesis of ideas) and analytic (analysis and logical sequencing) learning strategies. Results of the study indicated the following characteristics were exhibited by students who completed the essay:

1. Students earning the highest scores integrated deep and achieving approaches.
2. All completers were more likely than non completers to be motivated intrinsically extrinsically.
3. Higher scoring students were more likely to use analytic strategies.
4. All completers used global strategies.
5. Lowest scoring students were more likely to memorize data than to analyze it.
6. Lower scoring students were less likely to value and consider extrinsic criteria and were more likely to value personal interests.
7. Higher scoring students were more likely to balance global and analytic strategies.

In summary, students who were successful on the 4000 word essay were characterized by:

1. innovative thinking
2. integration with prior knowledge
3. manipulation of information in increasingly higher cognitive levels

4. use of feedback to self-evaluate product and thought process
5. self-regulated learning

Recommended Teacher Behaviors

The Extended Essay is viewed as the culmination of the IB course of study and the authentication of the IB approach to learning. With that understanding, Munro (2002) extrapolated teacher behaviors that would be necessary to produce high level student metacognitive behaviors and motivation characterized in the research. Although the research did not extend to teacher behaviors, Munro concluded that for students to be successful, IB teachers needed to teach:

1. approaches to learning characterized by motivation to increase scope, complexity, and retention of knowledge; probe for underlying meanings and question ideas
2. motivation to learn by teaching how to manipulate knowledge and cognitively investigate a priori knowledge
3. motivation to learn by developing self-confident, self-regulated learners

In fact, the IBO (2002a) has not conducted or based its program design on research on teaching effectiveness in the international venue. International literature recommends teacher training in reflective practice (Powell, 2000) and suggests that the qualities of collegiality and flexibility in dealing with intercultural challenges are advisable for international teachers (Garton, 2000). Otherwise, referring to research, the IBO (2002a) comments, "...in the context of international education, not a great deal is known about the effectiveness of different teaching styles and methods..." (p.14). As an international organization the IB has designed its program to meet educational needs globally; and, therefore, considers teacher effectiveness qualities within the global context (IBO, 2002a).

National Research Council Report

NRC report findings. A study by the National Research Council (Gollub, et.al., 2002) of advanced academic programs, the IB and the AP, commended both programs for providing challenge for motivated students. However, the NRC criticized the programs for their lack of research to validate program practices and found several areas to be lacking. While recommending that more children have access to the both programs and commending the strides in American education made by them, the report made several recommendations for improvements. (Only those recommendations specific to IB are presented here).

1. The...IBO should evaluate their assessments to ensure that they measure the conceptual understanding and complex reasoning that should be the primary goal of advanced study.
2. ...the IBO should take more responsibility for ensuring the use of appropriate instructional approaches. Specifying the knowledge and skills that are important for beginning teachers and providing models for teacher development are likely to advance teacher effectiveness.
3. The...IBO should provide assistance to schools in their efforts to offer high-quality advanced courses.
4. The...IBO should develop programs of research on the implementation and effectiveness of their program (p. 14-15)

Additionally, the Research Council criticized both programs for favoring coverage of material over depth in the areas of math and science. Although the report commends the IB and the AP for elevating the study of math and science in the country, it criticizes the practice of

offering an excessive number of topics at the expense of emphasis on key concepts (Gollub, Bertenthal, Labov, & Curtis, 2002).

The International Baccalaureate Organization response. In its response to the NRC, the IB Organization expressed disagreement with the criticism that science and math courses lack depth of instruction. The IBO reminded the NRC that, unlike other advanced academic programs, IB courses are integrated over a two year period thus allowing for depth and complexity as well as breadth of coverage (Wallace, 2002). In spite of the Council's criticisms of the national emphasis on assessments, it recognized the validity of the assessment system. The multiple assessments and the varied forms of assessment of the IB Program were commended as good instructional practice (Gollub et.al., 2002).

However, the Organization acknowledged its agreement with two recommendations. The IBO recognizes the need to expand and improve teacher training, while asserting that it has long recognized the value of effective professional development (Wallace, 2002). As a result the organization has redesigned its professional development to focus on training that advances both content and pedagogical knowledge (Bechtel & Waterson, 2003; R. Cline, personal communication, July 17, 2003). "Areas of particular interest include teachers as learners, teachers as managers of learning, teachers as innovators, the teacher-student relationship in learning, and the training and recruitment of teachers for international education" (Thompson, 1999). Training - introductory, advanced, and specialized - is vital to accomplishment of the teacher's responsibility for student achievement on end-of-course exams (Bechtel, T. & Waterson, M. 2003; IBO & The College Board, 2002; Rothman, 2002).

The IBO also acknowledged the lack of and need for research providing data on the quality of the program. Consequently, the recently established IB Research Unit (IBRU) in the

United Kingdom and the IB Curriculum and Assessment Centre (IBCA) in Cardiff, Wales have formed a partnership to actively encourage research to provide this data (IBRU & IBCA, 2001, p.1-2).

Recommended Practices in the International Baccalaureate Program

The practices presented in this section of the review are recommended for advanced educational programming as a result of research or their fit with teaching and learning theory. Although educators attribute the incorporation of these practices within the IB program design, research does not validate that attribution. Consequently, although many are research-based practices, they will be referred to as recommended practices within the IB context.

Experts in the field of gifted education recommend IB Programs as options for gifted students because of the link between IB and gifted program design and the similarity of program goals as evidenced in the IBO's philosophy on teaching and learning. Increasingly gifted educators recommend the integration of experiential learning within appropriate gifted programming (VanTassel-Baska & Little, 2003), a practice similar to the IB's requirement for community service in the Program's Creativity, Action, and Service component.

The IB ensures rigor and challenge and allows adaptation to varied advanced educational learning approaches. In addition, the International Baccalaureate framework, from the primary years through the secondary school programs, replicates best practices for gifted education. For these reasons gifted educators recommend IB as an advanced educational option for gifted and high ability learners (Feldhusen, VanTassel-Baska, & Seeley, 1989; Maker & Nielson, 1996; Nugent & Karnes, 2002; Renzulli & Reiss, 1985; Speed & Appleyard, 1985; VanTassel-Baska & Little, 2003; VanTassel-Baska & Olszewski-Kubilius, 1989).

Program Design

Program design of IB assessments. The process of multiple and varied forms of assessment and the differentiated evaluation criteria make the IB a model for assessment. In addition to end-of-course (external assessments), the program also requires teacher evaluated internal assessments. The varied products of internal assessments include laboratory experiments, oral presentations, math portfolios, and analytical essays. In addition, the evaluation criteria allow for differentiation in assessment by the teacher. The multiple and varied forms of assessment and the differentiated evaluation criteria fit the model for advanced educational programs based on the following precepts:

- assessment of key principles, concepts, and content
- multiple questioning formats
- moderation (review) by multiple experts
- deliberate scoring procedures
- equal value on process and product (IBO, 2002a; VanTassel-Baska & Little, 2003, p.315)

Program design in the format of external assessments and the culminating Extended Essay has been praised for the approach to instruction they encourage. Rothman (2002) asserts that the format of assessments encourages both choice of course content and in-depth instruction rather than rote memorization. In a comparison of AP examinations, Matthews, the designer of the list of 100 Best High Schools in America. for *Newsweek* magazine (personal communication, July 23, 2003) stated that IB exams “are clearly better” because:

- All students are required to take the exams.
- The final examinations are longer and tougher.
- The Extended Essay is required.

Program design in the nature of teaching and learning. Although research does not validate the implementation of their practice by IB educators, the design of the International Baccalaureate Program allows for incorporation of practices consistent with teaching and learning theory. The integrative nature of the IB design is a model of interdisciplinarity, differentiation, and flexibility (IBO, 2002a; Nugent & Karnes, 2002; VanTassel-Baska & Little, 2003).

The six subject groups and the three components are integrated across and within courses. The two-year time frame for teaching many subjects allows for integration of information over that time span. In addition, the three components are capstones of interdisciplinarity in their integration of knowledge across all disciplines. This integrative nature of learning in the IB promotes critical thinking and diversity of thought and opinion (Duevel, 1999; IBO, 2002a; VanTassel-Baska & Little, 2003).

The flexibility of the program's course and assessment structure allows for differentiated student interests and abilities. It provides for students to monitor their own pacing for completion of course requirements and embarkation on new content (VanTassel-Baska & Olszewski-Kubilius, 1989). Program design aspects that compared favorably to best practices for gifted education incorporated the following characteristics:

- interdisciplinary and integrated curriculum
- individualized and accelerated pacing
- self-regulated learning
- globalism
- problem-finding and problem-solving approaches to learning (IBO, 2002a; Munro, 2002; Silverman, 1990; VanTassel-Baska & Little, 2003)

Many of the characteristics described by VanTassel-Baska and Little and by Silverman lend themselves to extrapolation as best practices for teachers in the IB classroom. The program design incorporates these strategies; therefore, in order to achieve program goals and fulfill program requirements, teachers will need to implement complimentary practices.

The National Research Center on the Gifted and Talented (NRC/GT) (Gubbins, 2002; Renzulli & Reiss, 1985) describes the characteristics of an effective programming for gifted and high ability students and includes the IB as an option. Although the NRC/GT does not discuss the implementation of recommended practices by IB teachers, the Center describes the criteria for programs that meet the needs of the gifted. Since the IB is recommended as part of a continuum of services for gifted students, these practices can be extrapolated to be recommended practices for IB teachers. They include the following criteria:

- differentiated curriculum characterized by high cognitive concepts and processes
- gifted instructional strategies
- flexibility and differentiation in assessments, grouping arrangements, and other program aspects
- professional development to train teachers in gifted centered methodologies

These criteria for best practices in gifted programming compare favorably to characteristics of IB programming for assessments and curriculum design.

The International Baccalaureate is one of two programs used to qualify schools for inclusion on the list of Top American High School. Although Matthews, the designer of the rankings, did not consider IB until 1999, he states definitively that IB is “clearly better” than other advanced public school academic programs for its assessment structure, as already discussed, and because:

- it allows more in-depth instruction
- it has the community service component
- it trains all teachers in the integral nature of the IB program
- of the power of its international focus (personal communication, July 23, 2003)

Internationalism. As is characteristic of advanced educational programming and international education, IB is child-centered, an approach that is evident in IB curriculum, assessments, and teaching and learning characteristics (Phillips, 2002) This philosophy exemplifies the appeal of the program as an advanced educational opportunity for gifted/high ability and general education educators who call for globalism in educational programming (VanTassel-Baska, 1993; VanTassel-Baska & Little, 2003; Walker, 2002). The component of internationalism places the IB as a leader in the current forum of politics as well as in education. The program itself is reflected in the words of Secretary of Education Paige (2002) who enunciated the need for schools to improve international study of languages, cultures, and histories.

In summary, although research has not been conducted to verify the implementation of recommended practices within the classroom, the IB Program incorporates the principles of teaching and learning in its design and philosophy. The principles reflected in the design are consistent with recommended practices and research on teacher effectiveness for general education and advanced educational programming.

The IB mission statement. The revised Mission Statement for 2003 and the original Mission Statement state the philosophy of the organization. (Note: Components that reflect best practices for gifted education are bolded.)

The International Baccalaureate Organization aims to develop **inquiring, knowledgeable** and caring young people who help to create a better and more peaceful world through **intercultural understanding and respect**. To this end the IBO works with schools, governments and international organizations to develop **challenging programmes** of international education and **rigorous assessment**. These programmes encourage students across the world to become **active, compassionate and lifelong learners** who understand that other people, with their differences, can also be right. (IBO, 2003a, p. 2)

Components in original Mission Statement also indicate best practices for gifted education.

Education For Life

Through **comprehensive and balanced curricula** coupled with **challenging assessments**, the International Baccalaureate Organization aims to assist schools in their endeavours to **develop the individual talents** of young people and teach them to **relate the experience of the classroom to the realities of the world outside**.

Beyond **intellectual rigour and high academic standards**, strong emphasis is placed on the ideals of **international understanding** and responsible citizen ship, to the end that IB students may become **critical and compassionate thinkers, lifelong learners and informed participants** in local and world affairs, conscious of the shared humanity that binds all people together while respecting the variety of cultures and attitudes that makes for the richness of life (IBO, n.d. p.1).

Anecdotal Evidence on International Baccalaureate Practices

Other than the research data and recommended practices presented above, the preponderance of literature on the International Baccalaureate Program is anecdotal, based on

experiential evidence of individuals involved in the program. The following review is exemplary of the available anecdotal literature.

Teacher Practices

A student article (Choudhury, 1994) written in a high school newspaper provided anecdotal evidence corroborating the success of the IB teacher in the inculcation of advanced academic skills.

“Our English teacher forced us to read and reread and discuss at length, so that we could look at any literary work from many angles in search of deeper meaning. I was amazed by how much our teachers knew and understood, by how committed they were to helping us grow intellectually” (p.6).

Choudhury and other students engaged in problem-solving activities, thoroughly exploring and examining teacher designed questions until they, the students, resolved the problems. In a comparison of IB with her college experience, she said favorably of IB, “...I have not found as much questioning and in depth analysis” (p.6). The description of the IB teacher and teacher designed activities present a favorable comparison with research findings on best practices for teaching in advanced educational programs.

A similar student written article, this one published in *IB World*, the journal distributed to IB authorized schools, illustrated the advantages of the accelerated pace of the coursework and the ability of the program and teachers to meet the needs of a diverse student body. The teachers were praised for their abilities to develop an attitude of scholarship and to teach support of individual beliefs (Lewis, 2003).

Although experiential knowledge is not empirical research, it provides insight into the mind of an effective IB teacher. Rothman (2002), an IB teacher in Washington DC, described the

effective IB teacher in terms that compared to the best teachers of gifted students. IB teachers face the pressures of teaching to criterion-referenced tests; nevertheless, Rothman concluded that many of his colleagues viewed examinations, not as limiting, but as avenues by which they taught students to be efficient and insightful problem-solvers and masters of content. In addition to differentiating their marking of assessments, teachers provided samples of student work as models of the high level work expected of students. Rothman praised the freedom of IB teachers to design their instruction to convey depth and breadth, fact and concept, and content and process. Although specific content coverage was necessitated by the assessment procedure, teachers had the opportunity to engage students in provocative activities and meaningful assignments rather than the busy work gifted students find so distasteful (Maker & Nielson, 1996; Rothman, 2002).

The research is severely limited to undergird the quality of the International Baccalaureate Program and the practices of International Baccalaureate teachers. However, the high regard held by educators for the structure of the program and the success of its students allows extrapolation about the consistency of program design and teacher practices with those recommended for effectiveness in advanced educational opportunities.

Summary

The research indicates that Stronge's Model of Effective Teaching is a suitable framework for effective teaching for advanced educational opportunities. Application of the framework was not possible for the International Baccalaureate teacher because of the lack effectiveness research on the program. Literature in the fields of general and gifted education is replete with extensive research findings and recommendations for best practices while literature on the IB Program consists mainly of limited data on student achievement, comparisons to best

practices for general education and advanced educational opportunities, and anecdotal evidence. The literature on teacher practices was confined to anecdotal evidence (Lewis, 2003; Rothman, 2002) and to recommendations for best practices (Munro, 2002).

The findings of research used to develop Stronge's Model of Effective Teaching are similar to research findings on and recommended practices for teachers of gifted and high ability students. While Stronge's research did not find a correlation between teacher ability and student achievement, recommended practices for gifted education do emphasize its relevance. In addition, higher levels of cognitive questioning seem to be especially pertinent to teaching of gifted students as does discovery and investigative learning. These effectiveness practices and behaviors are vital for teachers of gifted/high ability students to avert the crisis many of these students face from inadequate instruction and programming.

The review of literature in all three settings indicates the relevance of two specific characteristics of the Model of Effective Teaching. The levels of teacher-efficacy beliefs and cognitive levels of questioning influence cognitive processing and enhanced student achievement. The teachers' beliefs of personal power to influence student performance determine the teacher's approach to the teaching task. A teacher who is willing to take risks and who persists in the face of challenge will critically impact a setting in which high student cognitive processing and achievement are required. The highly structured nature of the course and assessment design of the International Baccalaureate Program seems to necessitate a teacher who is willing to take on the challenge of that structure. The research suggests that the teacher characterized by high teacher-efficacy in other settings will be characteristic of the effective teacher in the IB setting. Finally, research indicates that the achievement of the goal of high cognitive processing is linked to levels of questioning pursued by the teacher. The teacher who

exhibits a willingness to persist with probing questions rather than to lower expectations appears to be more likely to achieve the results of student performance required for success by the International Baccalaureate student.

Chapter 3

METHODOLOGY

The major purpose of this study was to compare the practices recommended for effective teaching of teachers of International Baccalaureate students with recommended practices for teachers of regular education and gifted/high ability students. A mixed case study design was examined qualitatively and quantitatively specific recommended practices of International Baccalaureate teachers using the framework of Stronge's Model of Effective Teaching. The recommended practices extracted from the model were (a) instructional skills, (b) assessment practices, and (c) the construct of teachers' sense of efficacy.

The research methodology addressed in this chapter was divided into the following sections that presented a discussion of (a) the research questions, (b) the multi-case study method, (c) the variables of interest, (d) the sample and generalizability of the study, (e) the instrumentation, (f) data collection procedures, (g) data analysis procedures, (h) ethical safeguards, and (i) resources.

Research Questions

The research questions are as follows:

1. How do recommended International Baccalaureate curricular and program goals compare to practices recommended for effective instruction in general education and for gifted/high ability learners?
2. As determined by observation to what degree do teachers of International Baccalaureate students exhibit effectiveness behaviors in their implementation of instructional skills?

3. As determined by observation to what degree do teachers of International Baccalaureate students use a variety of assessment practices to monitor student progress?
4. At what levels do teachers of International Baccalaureate students self-report their Teacher-Efficacy beliefs in comparison with a sample of a cross-section of high school teachers?

The Case Study Method

The case study method of research as defined by Stake (1995) is “the study of the particularity and complexity of a single case, coming to understand its activity within important circumstances” (p. vi). Yin (1995) offered another view of the method. “A case study is an empirical query that: investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p.13). Cases are structured by presenting the problem, context, issues and lessons learned and are characterized by systems bounded by space and time, multiple sources of data collection, and thick description of context (Creswell, 1998). The approach is particularly advantageous when the phenomenon subject to study is a contemporary issue (Yin).

Case studies lend themselves to a design that allows for the treatment of data both qualitatively and quantitatively (Yin, 1995). To increase the validity and generalizability of the findings multiple sources are used to collect data. Qualitative data is organized into a database and documented at the date and time of collection. It is analyzed, coded, and categorized to determine recurring themes and characteristics. Multiple sites or single sites may be studied; however, the multi-site approach affords an advantage in the generalizability of the findings. If

steps are taken to avoid overgeneralization of the results, the multi-case study method allows for a larger generalization than a single case study (Yin).

This study used a multi-case study qualitative/quantitative design. A qualitative approach was appropriate to examine Research Question 1. The data was obtained through the Review of Literature within the framework of the Stronge Model of Effective Teaching (2002). The data on recommended practices for general and gifted education were examined within the context of the Six Domains of the Stronge Model. The results were compared to recommended curricular and program goals in the International Baccalaureate setting to determine if IB goals were consistent with effective instructional practices as defined by the Stronge model. These data were treated to a comparative analysis to determine the dissonance in practices and goals for the varied settings.

A qualitative and quantitative approach was appropriate for questions 2, 3, and 4. Data was collected through observation for Research Questions 2 and 3 and rated using the Teacher Effectiveness Behavior Scale. The findings were analyzed qualitatively and quantitatively through descriptive statistical procedures that report means and standard deviations. The results were compared to data from a comparative case analysis by Stronge, Tucker, and Ward (2003). Data to answer question 4 were collected through self-report using the Teachers' Sense of Efficacy Scale (TSES) and analyzed quantitatively through descriptive statistics reporting means and standard deviations for the three subscales. It was compared to teachers' sense of efficacy data on a sample of high school teachers obtained by Tschannen-Moran in a prior study of high school teachers.

The two sites that were investigated in this study had differing characteristics, but they were ultimately bound together by the particular phenomenon of the International Baccalaureate Program.

Variables of Interest

The variables of interest for all Research Questions were based on the Stronge Model of Effective Teaching. Although teachers' sense of efficacy is a major variable it is related to Domain 2 (The Person) of the Stronge Model.

Effective Teaching

Research Question 1 examined all Six Domains of the Model while Questions 2 through 4 examined characteristics or sub-domains of specific domains.

Research Question 1: Recommended Goals and Practices

The variables for Research Question 1 were the recommended practices for teacher effectiveness as defined by the Six Domains of the Stronge Model of Effective Teaching. The domains that described effective teaching were developed through a meta-synthesis of valid effectiveness research. All Six Domains of Effective Teaching examined as variables of interest for this question were:

- Prerequisites of Effective Teaching
- The Teacher as a Person
- Classroom Management and Organization
- Organizing and Orienting for Instruction
- Implementing Instruction
- Monitoring Student Progress and Potential

The variables were applied to recommended practices for teachers of general education and gifted students and to curricular and program goals in the IB Program. In designing the model, Stronge considered only proximal variables within the control and influence of the teacher.

Variables such as student demographics and administrative policies, although they affect student

achievement, are outside of the teacher's locus of control and were not considered as teacher effectiveness factors. Stronge's consequent Model of Effective Teaching captures the concept of effective teaching and, therefore, served as the framework for this study.

Research Question 2: Implementing Instruction

The variables of interest for Research Question 2 were sub-domains and characteristics of Domain 5: Implementing Instruction from the Stronge Model of Effective Teaching. The variables describe effective teacher behaviors by instructional skills practiced in the classroom.

Instructional skills. The areas of instructional skills examined were:

- Instructional differentiation
- Instructional focus on learning
- Instructional clarity
- Instructional complexity
- Expectations for student learning

Research Question 3: Monitoring Student Progress and Potential

The variables of interest for research question 3 were the assessment practices implemented by IB teachers to monitor student learning.

Teachers' Sense of Efficacy

Research Question 4: Teachers' Sense of Efficacy

The variables of interest for Research Question 4 were the three Teachers Sense of Efficacy subscales of (1) sense of efficacy in student engagement, (2) sense of efficacy in instructional strategies, and (3) sense of efficacy in classroom management and the total of the three subscales in the construct of teachers' sense of efficacy as defined by Tschannen-Moran, Hoy, & Hoy, (1998).

The model is defined by the two interrelated dimensions of *analysis of teaching task and context* and *self-perception of teaching competence*. Teachers' sense of efficacy is characteristic of the teacher who, through reflective practice analyzes and adjusts teaching practices to enhance effectiveness of instruction. Reflective practice is a sub-domain of Domain 2: The Teacher as a Person from the Stronge Model of Effective Teaching.

Sample and Generalizability

Sample

This study examined two cases, one in a moderately sized Virginia county, and the second in a moderately sized Virginia urban area. A purposeful sample of teachers in the International Baccalaureate Program was selected from two separate but similar contexts. The IB Program is housed in one high school in each district, both of which act as magnet centers to serve the entire district. All IB teachers in both districts attended introductory training and advanced teacher training in IB sanctioned workshops. Both IB Programs are small Diploma Programs of similar size in which all students take courses in each of the six subject groups and complete the three components of Theory of Knowledge, CAS (Community, Action, and Service), and the Extended Essay. Both programs require an application process to determine eligibility of prospective candidates that included specific criteria for selection: standardized test scores in the 9th decile, GPA's of 3.0 or higher, grades of B or higher, completion of algebra I with a B or better, a student essay, and teacher recommendations.

Entry to the county school district was obtained through a cover letter to the assistant superintendent for instruction requesting permission to conduct the study in the high school which housed the county's International Baccalaureate Program. It was followed by an introductory message to the principal of the high school to arrange the observations. The high

school, located in a suburban community, had approximately 900 students. The IB program has a total of 13 IB and Pre-IB teachers and 90 students enrolled in IB/Pre-IB in grades 9-12.

Entry to the urban school district was obtained by the city's research approval process which was designed as an ethical safeguard. The Request for Approval: Research Projects form was completed by the researcher and submitted for approval by the Research Approval Committee in October, 2003. Approval was granted verbally and, subsequently, formalized in a letter in January, 2004. A follow up discussion was conducted with the high school principal and the researcher who is the program coordinator. The high school that houses the IB Magnet Center has approximately 1500 students. The IB Magnet Center has a total of 21 teachers and approximately 105 students in the IB/Pre-IB Program in grades 9-12.

A total of 34 teachers from the two schools were asked to complete the Teachers' Sense of Efficacy Scale (TSES). Five IB teachers from each of the two schools, for a total of 10 IB teachers, were observed to provide data for Questions 2 and 3. A letter of transmittal was included in the mailing to explain and request completion of the TSES and to request permission of 10 teachers in the sample to conduct the observations. The letter insured confidentiality and anonymity of participants. It is included in the Appendix. Letters of approval from the two school districts are not included in the Appendix due to the guarantee of confidentiality.

Generalizability

The generalizability of this study is limited by the characteristics of the sample population. Since the study did not examine the data based on comparisons of teachers' educational and personal characteristics, it was possible that the teachers differed greatly from their peers in other IB Programs.

In addition, the samples used in the two comparative case analyses varied greatly from the sample used in this study. Stronge, Tucker, and Ward (2003) observed 85 third grade classrooms one week prior to administration of Virginia Standards of Learning tests while the observations of IB teachers were conducted in 10 classrooms four months prior to external (end-of-course) assessments. The population surveyed by Tschannen-Moran & Hoy (2002) consisted of 255 kindergarten through 12th grade educators in urban, suburban, and rural settings, some of whom may have included IB and gifted teachers.

Generalizability may also be affected by the researcher who is the Coordinator of the International Baccalaureate Magnet Center at the urban high school. To reduce the threat of bias and to increase generalizability the researcher was involved as a participant/observer. The advantage of the participant/observer role was the elimination of the time and effort spent on gaining entry into the context and gaining trust of the participants (Creswell, 1998).

Instrumentation

Effective Teaching

Two instruments were used to collect data for this study to develop a profile of the effective teacher in the International Baccalaureate classroom. These instruments included a) Teacher Effectiveness Behavior Scale: Instructional Skills, b) Teacher Effectiveness Behavior Scale: Assessment Practices, and c) Teachers' Sense of Efficacy Scale (TSES). The Teacher Effectiveness Behavior Scale was designed from research on effective teaching behaviors. It were developed for use by Stronge and Tucker (2003) for their study of effective behaviors of effective and ineffective third grade teachers in a moderately sized urban Virginia school district. The study was originally presented at the American Educational Research Association Conference in Chicago in April 2003. The Teacher Effectiveness Behavior Scale was obtained

from Stronge of the College of William and Mary. The Teachers' Sense of Efficacy Scale was obtained from Dr. Megan Tschannen-Moran also of the College of William and Mary. The instruments - the Teacher Effectiveness Behavior Scale: Instructional Skills, the Teacher Effectiveness Behavior Scale: Assessment Practices, and the TSES - are included in the Appendix. Both instruments are described below.

Research Question 1: Recommended Goals and Practices

Research Question 1 is presented as a content analysis of data analyzed from the Review of Literature. The framework for that analysis is the research based Model of Effective Teaching which is defined by six effectiveness domains. No specific instrument is used in the analysis.

Research Question 2: Implementing Instruction

Instructional skills. The Teacher Effectiveness Behavior Scale is a behaviorally-focused scale that is designed to enable the observer to assess both the types of effective teaching behaviors and the extent to which they are practiced by International Baccalaureate teachers. Observed teacher behaviors were examined and rated on the Behavior Scale, which is summarized into the five instructional skills listed above. The framework for the five instructional skills is based on Domain 5 of Stronge's Effectiveness Model. Each skill is rated on a scale ranging from 1 to 4, with 1 indicating the least effective level of performance and 4 indicating the most effective level of performance. The teacher who would be awarded a level 4 for the skill of instructional differentiation would use "a broad repertoire of instructional strategies with fluency and flexibility to differentiate instruction for individual or groups of students." The teacher who would be awarded a level 1 for the same skill would be one who "relies heavily on one or two instructional strategies primarily involving lecture or seatwork for the whole class."

The validity of the scale was determined in the study of effective and ineffective teachers by Stronge, Tucker, and Ward described above. Statistical models were used to assess teacher

effectiveness. Through observations using 20 dimensions of the behavior scale, including the five instructional skills examined in this study, Stronge, Tucker, and Ward compared effective teachers, “those who facilitated higher than expected learning gains for students,” to ineffective teachers, “those who facilitated lower than expected learning gains” (p.15). On 18 of the 20 dimensions effective teachers received higher scores than ineffective teachers. The effective teachers outperformed the ineffective teachers at a significance level of $p < .05$ on the skills of instruction differentiation and instructional complexity.

Research Question 3: Monitoring Student Progress and Potential

The instruments used to collect data on assessment practices of IB teachers were the Teacher Effectiveness Behavior Scale for Assessment Skills. The teacher who receives a score of 4 for quality of verbal feedback would be one who “consistently, addresses individual student strengths and weaknesses, and encourages student self-reflection. Feedback is fair and demonstrates high expectations for all students.” A teacher with a rating of 1 “provides *verbal* feedback that is limited to correctness of response. There is little or no direction provided for improvement in performance.” The scale is discussed more thoroughly above in research question 2.

Teachers' Sense of Efficacy

Question 4: Teachers' Sense of Efficacy

Data to determine teachers' sense of efficacy beliefs were collected on the 24-question Teachers' Sense of Efficacy Scale (TSES) from teachers identified as International Baccalaureate teachers. Tschannen-Moran, Hoy, and Hoy (2001) conducted three studies to insure construct validity for the instrument. The items on the scale were originally selected from Bandura's scale and subject to factor analysis in the studies which resulted in a 24-item long form and a 12-item short form. The construct reliability was .94 for the 24-item scale and .90 for the 12-item scale. The Long Form was used in this study.

Consideration was taken to include items that assess teachers' judgment of their abilities to respond to the "instructional needs of capable learners" (p.799). The instrument's authors found that responses to the TSES loaded on three factors: efficacy for student engagement, efficacy for instructional practices, and efficacy for classroom management. The items are equally weighted. The groupings of the items for each subscale on the Long Form are:

*Figure 3.1:
TSES Subscale Groupings*

EFFICACY SUBSCALE	QUESTIONNAIRE ITEMS
Efficacy for student engagement	Questionnaire items 1, 2, 4, 6, 9, 12, 14, 22
Efficacy for instructional practices	Questionnaire items 7, 10, 11, 17, 18, 20, 23, 24
Efficacy for classroom management	Questionnaire items 3, 5, 8, 13, 15, 16, 19, 21

Sample items included in the subscale efficacy for student engagement are:

1. How much can you do to get through to the most difficult students?
2. How much can you do to help your students think critically?

Sample items included in the subscale efficacy for instructional strategies are:

7. How much can you respond to difficult questions from your students?
10. How much can you gauge student comprehension of what you have taught?

Sample items included in the subscale efficacy for classroom management are:

3. How much can you do to control disruptive behavior in the classroom?
5. To what extent can you make your expectations clear about student behavior?

Teachers responded to each item using a Likert scale with nine possible choices ranging from nothing to a great deal. The total possible responses were: nothing, very little, some influence, quite a bit, a great deal.

Data Collection Procedures

Data were collected using both qualitative and quantitative methods for research questions 1 through 4.

Effective Teaching

Research question 1: Recommended Goals and Practices

Information collected from the Review of Literature on recommended instructional practices in general education and gifted education and recommended curricular and program goals in the International Baccalaureate Program was analyzed based on the Stronge Model of Effective Teaching as the framework for the analysis of the data. The data was then classified according to the Six Domains of the model and a content analysis was conducted to determine the dissonance between recommended practices for teachers of general education and gifted students and recommended curricular and program goals for the International Baccalaureate Program.

Research question 2: Implementing Instruction

Instructional skills. Data were collected in the fall of 2003 on the five Instructional Skills implemented by IB teachers through 60-90 minute observations of 10 teachers in International Baccalaureate Programs in two different contexts, an urban Virginia high school (N=5) and a county Virginia high school (N=5). Teacher behaviors were recorded in writing, categorized and rated based on the levels of performance on the Teacher Effectiveness Behavior Scale, which can be found in the Appendix. The behavior scale was completed by the observer subsequent to the classroom observation.

Question 3: Monitoring Student Progress and Potential

Data were collected to examine two assessment practices of IB teachers through the 60-90 minute observation procedure described above under Instructional Skills. Teacher practices were recorded in writing, categorized and rated based on the levels of performance on the Teacher Effectiveness Behavior Scale found in the Appendix.

Teachers' Sense of Efficacy

Question 4: Teachers' Sense of Efficacy

Data were collected from 33 of 34 teachers in International Baccalaureate Programs in two separate contexts in Virginia. The Teachers' Sense of Efficacy Scale (See the Appendix.) was mailed to teachers in the two contexts, along with a letter of transmittal, prior to conducting the observations in late fall of 2003. The teachers were requested to complete the 24-item questionnaire which they returned in sealed envelopes to their program coordinator prior to the date of the first observation. An envelope was included in the original mailing. The envelopes were collected from the program coordinator by the observer at the time of the observations.

Data Analysis

Qualitative and quantitative approaches were used to analyze the data in the mixed study design. Question 1 was analyzed qualitatively through a content analysis; the data for questions 2 and 3 were obtained through observation and are presented in narrative form as well as with descriptive statistics. The data for question 4 was obtained through the administration of a questionnaire and presented with descriptive statistics. Both questions 2 and 4 are examined in relation to similar studies. However, caution is advised in extending to broad a comparison in both comparative analyses.

Effective Teaching

Question 1: Recommended Goals and Practices

A qualitative content analysis was conducted to analyze the data from the review of literature on recommended instructional practices in general education, gifted education, and International Baccalaureate Programs. The data were then analyzed within the framework of the Six Domains of the Stronge Model of Effective Teaching to determine the dissonance between the general and gifted/high ability education settings and the IB setting. Where sufficient teacher effectiveness data was not available in the literature on recommended practices for IB teachers, an analysis was extrapolated from literature on IB Program design and student outcomes.

Question 2: Implementing Instruction

Instructional skills. Each item on the Teacher Effectiveness Rating Form was analyzed using the rating levels of the teacher effectiveness behavior scale. The information from the classroom observation notes was coded and categorized to develop a final effectiveness rating for each teacher. Descriptive statistical procedures were used to report the data. Means and standard deviations were computed for each instructional skill area. As a limited indicator of the generalizability of the results, the means and standard deviations of each category were cautiously compared to the findings from a Virginia study by Stronge, Tucker, and Ward (2003) of general education teachers. Any comparison between the findings of this study and the findings of the comparative case study are extremely limited in generalizability due to the differences in populations described above.

Question 3: Monitoring Student Progress and Potential

The procedure for analysis of data on teacher assessment practices is described above under instructional skills.

Teachers' Sense of Efficacy

Question 4: Teachers' Sense of Efficacy

The data obtained from the TSES was treated to quantitative analysis using descriptive statistical procedures - percentages, means and standard deviations. Responses to each item on the TSES were divided into the three subscales and reported using descriptive statistical procedures. The subscales are efficacy for student engagement, efficacy for instructional practices, and efficacy for classroom management. Percentages, means, and standard deviations were computed for each of the subscales. Finally, the data from the three subscales were compared to those obtained by a Tschannen-Moran and Hoy (2002) study of 255 k-12 teachers in urban, suburban and rural general education settings. The Tschannen-Moran and Hoy was cautiously treated as a comparative case study with extremely limited generalizability due to the differences in population samples. The results are generalizable to teachers in IB Programs similar to those selected in the sample. The procedures are depicted below:

Figure 3.2
Research Procedures

Research Question	Instrumentation	Data Collection	Data Analysis
Q. 1	n/a	Review of Literature	content analysis
Q 2	Teacher Effectiveness Behavior Scale	Observation	descriptive statistics & comparative analysis
Q 3	Teacher Effectiveness Behavior Scale	Observation	descriptive statistics & comparative analysis
Q 4	Teacher's Sense of Efficacy Scale	Questionnaire	descriptive statistics & comparative analysis

Ethical Safeguards

The practice of this study was designed to protect the anonymity of each participant in the study. The cover letters included assurances of confidentiality and anonymity. The

observation data and the questionnaires did not contain or request information on the identity of the participants. The Request for Approval: Research Projects form was submitted for approval to the Research Approval Committee in the urban school district. In addition, proper procedures in keeping with appropriate research at the College of William and Mary were conducted. The proposal was submitted to the Protection of Human Subjects Committee at the College of William and Mary; and ethical safeguards were maintained. The approval of the Protection of Human Subjects Committee is included in the Appendix.

Chapter 4

SUMMARY OF RESULTS

Introduction

This study was conducted to examine recommended practices for International Baccalaureate Program teachers within the framework of Stronge's Model of Effective Teaching and to analyze those practices in conjunction with recommended practices for instruction of gifted and high ability learners. Curricular and program goals for the IB Program are examined and compared to recommended practices for general education and gifted education through a review of literature. Data on the qualities of effective teaching exhibited by IB teachers were obtained through observations in a multi-site case study conducted in two IB Program schools in two school districts. Specific qualities of effective teaching were selected from Stronge's Teacher Effectiveness Model. The section, the comparative analysis of IB program and curricular goals, provides a context for the discussion of the multi-site case studies.

The Summary of Results in this chapter is separated into sections that discuss (a) The Sample, (b) Research Question 1 Results, (c) Research Question 2 Results, (d) Research Question 3 Results, (e) Research Question 4 Results, and (f) Summary of Findings. The Sample section begins with a description of the case study sample and proceeds to a discussion of the response rate of the sample. It concludes with a description of the observation sample procedure and its subsections on selection process and observation process. The succeeding four sections analyze the data from the four research questions using a narrative format illustrated with figures and tables. The final section summarizes the results of the study.

Research Questions

1. How do recommended International Baccalaureate curricular and program goals compare to practices recommended for effective instruction in general education and for gifted/high ability learners?
2. As determined by observation to what degree do teachers of International Baccalaureate students exhibit effectiveness behaviors in their implementation of instructional skills and in their levels of complexity in questioning?
3. As determined by observation to what degree do teachers of International Baccalaureate students use a variety of assessment practices to monitor student progress?
4. At what levels do teachers of International Baccalaureate students self-report their Teacher-Efficacy beliefs in comparison with a sample of a cross-section of high school teachers?

The Sample

The sample for the multi-site case study was comprised of volunteers from two International Baccalaureate Programs in separate school districts. One district is in a moderately sized urban area while the other is in a moderately sized county. The urban school district has a population of approximately 23,000 students in four high schools, 6 middle schools, 24 elementary schools, 1 charter school, and 1 elementary gifted magnet school. The county has a population of 12,450 students in four high schools, four middle schools, 10 elementary schools, and 1 charter school. The school districts differ in size and in experience with the IB. At the time of the observation, the county program had taught IB/Pre-IB was preparing its third IB

graduating class while the urban high school was preparing its first graduating class. However, the programs are similar in size, student selection process, and program design. Both programs

- have approximately 90-100 students in grades 9-12
- require a student application and selection process based on ability
- offer the full IB Diploma Program rather than selected courses
- offer a similar schedule of courses
- all teachers have been trained in IB approved workshops

Study approval was granted by the Protection of Human Subjects Committee of the College at the William and Mary. The study approval stated, "This project was found to comply with appropriate ethical standards and was exempted from the need for formal review by the college of William and Mary Protection of Human Subjects Committee." See the Appendix for the full text of the approval notification.

Site permission to conduct the study was obtained from the assistant superintendent of instruction and the high school principal of the county school district and from the Research Approval Committee in the urban school district. The IB Program Coordinators in both schools disseminated and collected information for the research. International Baccalaureate teachers in the sample were contacted through cover letters that included the Teachers' Sense of Efficacy Scale (TSES), a check off slip to withdraw from selection for the observation, and a stamped envelop. The cover letter is included in the Appendix.

Response Rate to the Study

Observation Sample

Teachers were asked to participate in two parts of the study: the observation and the Teachers' Sense of Efficacy questionnaire. They could elect not to participate in both parts or in

one part of the study. To be excluded from the observation sample, teachers were requested to indicate their desire to be excluded on the last page of the cover letter and to mail it to the researcher in the enclosed stamped envelope. One teacher in the county school district requested to be excluded from the observation sample of 13 teachers ($n=13$). Two of 21 teachers ($n=21$) in the country school district requested to be excluded from the observation sample while one teacher agreed to participate with the condition of right to review the findings prior to analysis. Therefore, 12 teachers ($n=12$) comprised the selection pool from the county school district and 19 ($n=19$) comprised the selection pool from the urban district. The total observation sample consisted of a selection pool of 31 ($n=31$) of 34 teachers for a total response rate of 91.2%. To aid the reader the teachers in the observation sample are coded numerically as T1 through T10.

Teachers' Sense of Efficacy Sample

Participation or non-participation in the completion of the Teachers' Sense of Efficacy Scale was less overt. Teachers who did not wish to complete the questionnaire did not return the form to the coordinator of the school. Teachers who elected to participate returned the questionnaire anonymously to the coordinator's mailbox. The first distribution of the TSES yielded 10 responses from the county school and 18 responses from the urban school. The TSES was distributed for a second time in a thank you note with a gift of note paper and a pen; it was followed by an email thank you and reminder to the total sample of 34 teachers. At this distribution two additional teachers from the county school returned the TSES for a total of 12 ($n=12$); all teachers in the urban school returned the questionnaire for a total of 21 ($n=21$). The total number of questionnaires returned from both sites equaled 33 ($n=33$) of the 34 potential participants for a response rate of 97.06%.

Observation Sample Process

Selection Process

Once permission was obtained from the teachers to conduct the observations, six IB teachers were selected from each site by a random drawing. The researcher subsequently contacted each teacher through email to select and confirm observation dates. Although the study involved five observations from each school, a sixth selection was made in case of scheduling or other difficulties. An alternate from the county school district was withdrawn from the sample due to scheduling problems. The alternate from the urban school district was withdrawn after the observation for procedural difficulties. Thus, a part of the sample was eliminated from involvement in the study. The final sample ten teachers, coded as T1 through T10, were:

- 3 English teachers
- 2 math teachers
- 2 science teachers
- 2 history teachers
- 1 Theory of Knowledge teacher

Observation Process.

Ten 60-90 minute observations were conducted in the two school districts over a period of several days during the fall of 2003. The observations in the county school district were conducted over a four day period. Although both schools have a 90 minute alternating block schedule, the county school has one daily 60 minute block.

In the county school district one observation was interrupted after 45 minutes by a fire drill that lasted an additional 45 minutes. The class continued 30 more minutes upon return to the class; consequently, the last block to be observed was shortened to 60 minutes, causing the

cancellation of one lab. Since a similar lab was conducted after school as a make up lab, the researcher observed the teacher during the make up lab procedure. Therefore, the five observations conducted in the county school district consisted of three 90 minute observations and two 60 minute observations, with the addition of one 30 minute after class lab. Six 90 minute observations were conducted in the urban school district with the exclusion of one observation for reasons previously stated.

Data were recorded through scripting during the observations. With the caveat that permission to tape the observations would not be granted without individual permission from each student and parent, permission of each student was not requested. The purpose of the study was to investigate teacher practices rather than student behavior.

Research Question 1 Results

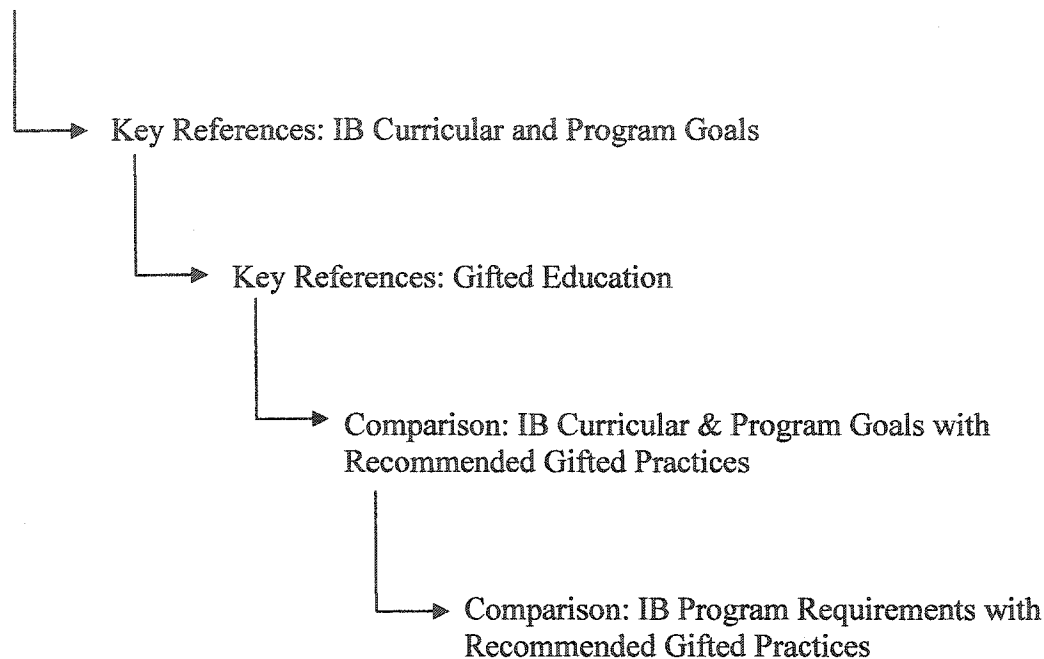
Research Question: How do recommended International Baccalaureate curricular and program goals compare to practices recommended for effective instruction in general education and for gifted/high ability learners?

The procedure for determining and presenting the comparison of International Baccalaureate Program goals with recommended practices for general and gifted education was conducted through a content analysis of the key references in the Review of Literature. This analysis moves sequentially through a treatment of the sources of data presented in the key references for general education, gifted education, and IB education with the addition of a summary of the program features discussed in the key references for IB education. It progresses through a review of curricular and program goals discussed in the key references, to a summary of the recommended practices for gifted education in the key references, to a comparison of IB curriculum and program goals with recommended practices for gifted education. Finally specific

aspects of each program feature are delineated and matched to the recommended gifted practices.

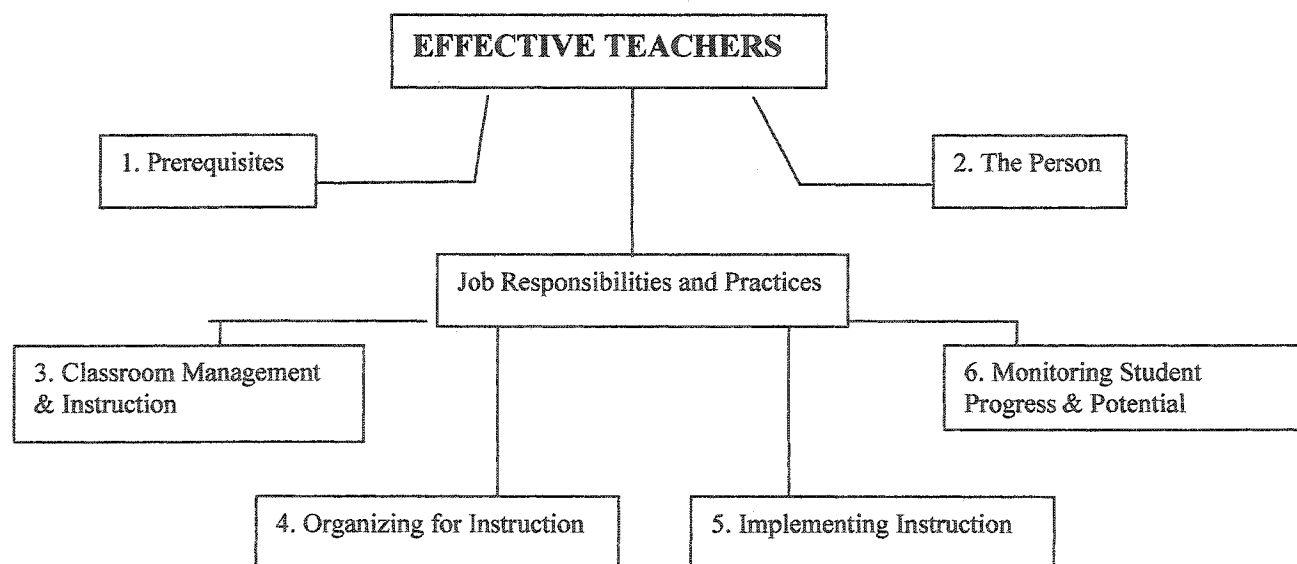
The analysis sequence is outlined below.

Data Sources (Key references for general, gifted, and IB education)



The researcher must reiterate that recommended practices for gifted education are presented in the Review of Literature within the framework of Stronge's Teacher Effectiveness Model. This model is reproduced here.

Stronge's Teacher Effectiveness Model



Data Source of Key References

The first step in the analytical process was an analysis of key references in general education, gifted education, and in the IB Program (Figure 4.1) presented in the Review of Literature. The analysis of key general and gifted education references revealed that the sources of data in the majority of these references were research-based or based on meta-syntheses of research. The analysis of key references for the IB Program was conducted within the three sections – Student Outcomes, Teacher Practices and Program Design - presented in the Review of Literature. The literature on teacher practices in the IB was extremely limited. The data were restricted to anecdotal evidence (Lewis, 2003; Rothman, 2002) and recommendations for best practices (Munro, 2002; Rothman, 2002) rather than on research-based data on teacher effectiveness. The research was limited to student achievement and program satisfaction. Research on effective practices for teachers of IB students had not been conducted to allow for a comparison with recommended practices for teachers of general or gifted education. The majority of the literature, instead, focused on IB program and curricular goals for student outcomes and program design with particular emphasis on assessment. Figure 4.1 is adapted from Stronge, 2002.

Figure 4.1
Key References: General Education, Gifted Education, International Baccalaureate

	Research & Meta-Syntheses	Best Practices	Anecdotal Evidence
General Education References			
Bain & Jacobs, 1990	•		
Berliner & Rosenshine, 1977	•		
Berliner, 1986	•		
Blair, 2000	•		
Borich, 2000	•	•	
Brookhart & Loadman, 1992	•		
Cawelti, 1999a	•		
Cawelti, 1999b	•		
Cotton, 1999	•	•	
Cotton, 2000	•	•	
Covino & Iwanicki, 1996	•		
Darling-Hammond, 2000	•		
Darling-Hammond, Berry & Thoreson, 2001	•		
Emmer, Evertson, & Anderson, 1980	•		
Ferguson & Womack, 1993	•		
Fetler, 1999	•		
Goldhaber & Brewer, 2000	•		
Good & Brophy, 1997	•	•	
Johnson, 1997	•		
Kulik & Kulik, 1992	•		
Marzano, Pickering, & McTighe, 1993	•		
Marzano, Pickering, & Pollock, 2001	•		
NASSP, 1997	•		
NBPTS, no date	•	•	
Peart & Campbell, 1999	•		
Reagan, Case, & Brubacher, 2000	•		
Rosenshine & Stevens, 1986	•	•	
Rowan, Chiang, & Miller, 1997	•		
Thomas & Montgomery, 1998	•		
Tschannen-Moran, Hoy & Hoy, 1998	•		
Wang, Haertel, & Walberg, 1993a	•		
Wang, Haertel, & Walberg, 1993b	•		
Wenglensky, 2000	•		

Figure 4.1
Key References: General Education, Gifted Education, International Baccalaureate

Gifted Education References	Research & Meta-Syntheses	Best Practices	Anecdotal Evidence
<i>Continued</i>			
Agne, 2001	•		•
Bechtel & Waterson, 2003			•
Callahan, 2001		•	
Carnine, 1993	•		
Carper, 2002	•		
Dubner, 1979	•		
Feldhusen, VanTassel-Baska, & Seeley, 1989	•	•	
Gentry, Rizza, & Owen, 2002	•		
Grant, 2002	•	•	
Haensly, 2001	•		
Hansford, 1985	•	•	
Heath, 1997	•		
Henderson, 1996	•		
Johnsen & Ryser, 1996	•		
Johnsen, Haensley, Ryser, & Ford, 2002	•		
Johnson, 2000	•	•	
Kapusnick & Hauslein, 2001	•		
Karnes, Stephens, & Wharton, 2000	•		
Lee-Corbin & Denicolo, 1998	•		
Maker & Nielsen, 1996	•	•	
Marzano, Pickering, & Pollard, 2000	•		
Nikakis, 2002	•		
Rash & Miller, 2000	•		
Renzulli, 1999	•	•	
Renzulli, 1986	•	•	
Renzulli & Reis, 1985	•	•	
Ross, 1998	•		
Silverman, 1995	•		
Silverman, 1990	•	•	
Smutney, 2000		•	
Speed and Appleyard, 1985		•	
Stepanick, 1999	•		
Sternberg & Grigorenko, 2002	•		
Thomas & Montgomery, 1998	•		
Torrance & Goff, 1990		•	
Tschannen-Moran, Hoy, & Hoy, 1998	•		
VanTassel-Baska, 1993		•	
VanTassel-Baska, Zuo, Avery, & Little, 2002	•		
Westberg & Archambeault, 1997	•		
Westberg, Archambeault, Dobyms, & Slavin, 1993	•		

Figure 4.1

Key References: General Education, Gifted Education, International Baccalaureate

International Baccalaureate Program References	Data Source			Program Feature		
	Research & Meta- Syntheses	Best Practices	Anecdotal Evidence	Program Design	Teacher Practices	Student Outcomes
<i>Continued</i>						
Arrington, 2003						•
Bechtel & Waterson, 2003				•		
Carson, 1990	•					•
Choudhury, 1994			•	•	•	•
Cline, 2003		•		•		
Duevel, 1999	•			•		•
Feldhusen, VanTassel-Baska, & Seeley, 1989		•		•		
Gollub, Bertenthol, Labov, & Curtis, 2002	•	•		•		
Gubbins, 2002		•		•		
IBO, 2002A		•		•		•
Jesse, 1999	•					•
Kolb & Eckhardt, 1999	•					•
Kolb, 2002	•					•
Lewis, 2003			•	•		
Maker & Nielson, 1996		•		•		
Mathews, 2002			•	•		
Munro, 2002		•			•	
Munro, 2002	•			•		•
Nugent & Karnes, 2002		•		•		•
Phillips, 2002		•	•	•		
Renzulli & Reiss, 1985		•		•		
Renzulli, 1996		•	•	•		
Rothman, 2002		•	•	•	•	
Scaturro & Campbell, 2003	•					•
Silverman, 1990		•		•		
Speed and Appleyard (1985)		•		•		
The IBO & The College Board, 2002	•			•		
VanTassel-Baska & Little, 2003		•		•		
VanTassel-Baska & Olszewski-Kubilius, 1989		•		•		
Wallace, 2002		•	•	•		

The results of this analysis corroborate the findings of the National Research Council (Gollub et.al., 2002):

1. ...the IBO should take more responsibility for ensuring the use of appropriate instructional approaches. Specifying the knowledge and skills that are important for beginning teachers and providing models for teacher development are likely to advance teacher effectiveness.
2. The...IBO should develop programs of research on the implementation and effectiveness of their program (p. 14-15)

The IB Organization acknowledged the need to focus on both areas of concern to the NRC, training and research (Bechtel & Waterson, 2003; R. Cline, personal communication, July 17, 2003). It has consequently reoriented its professional development practices to focus on “teachers as learners, teachers as managers of learning, teachers as innovators, the teacher-student relationship in learning, and the training and recruitment of teachers for international education” (Thompson, 1999). In response the IBO also established an IB Research Unit to partner with the IB Curriculum and Assessment Centre to actively encourage research to provide data on its curriculum and assessment program (IBRU & IBCA, 2001).

Assessment is a vital feature of program design to the extent that the literature singles it out as a key and distinguishing feature. Therefore, it will be analyzed as a separate entity and included generally as a feature of program design. An examination of the references for the goals of these three features – student outcomes, assessment, and program design - does suggest a comparison with recommended practices for general and gifted education. From the comparison it may be possible to extrapolate a link between recommended practices for teachers in general education and gifted education to those that would be expedient for teachers in the International Baccalaureate Program.

Key References: IB Curricular and Program Goals

Once the lack of research based evidence and the key program features were determined, the next step in the sequential process was to review the literature in Chapter 2 to identify the curricular and program goals presented within the context of those features - student outcomes, assessment, and program design. From the key references analyzed in Figure 4.1 for the IB Program, the most typical sources were extracted. As discussed earlier, references presenting anecdotal sources of data were not included in the analysis, thus eliminating information on teacher practices. Figure 4.2 presents the curricular and program goals determined for Student Outcomes; the curricular and program goals for Assessment; and the goals for Program Design.

Figure 4.2 below is adapted from Stronge, 2002.

Figure 4.2

Key References: International Baccalaureate Curricular & Program Goals

KEY REFERENCES		High student achievement	Independent work & pacing	Group collaboration & cooperation	Time organization	Understanding complex assignments	Innovative thinking	Integration with prior knowledge	High cognitive processing	Feedback to self-evaluate	Self-regulated learners	Development of metacognitive skills	Motivation to learn	High college acceptance/ graduation rate
STUDENT OUTCOMES	Arrington, 2003	•												•
	Carson, 1990	•									•		•	•
	Duevel, 1999		•	•	•	•			•		•			•
	Gubbins, 2002			•		•			•					
	IBO Mission Statement (2003a)	•				•	•	•	•		•			
	IBO. (2002a).	•				•	•	•	•		•	•	•	
	Jesse, 1999	•												•
	Kolb, 2002; Kolb & Eckhardt, 1999	•					•							•
	*Maker & Neilson, 1996	•	•				•			•				
	Munro, 2002	•	•		•	•	•	•	•	•	•	•	•	•
	Nugent & Karnes, 2002	•				•				•			•	
	*Renzulli & Reiss, 1985				•					•				
	Scaturro & Campbell, 2003	•												•
	*Silverman 1990			•							•			
	*VanTassel-Baska & Little, 2003	•	•				•			•	•	•	•	•
	*VanTassel-Baska & Olszewski-Kubilius, 1989	•	•				•			•	•	•	•	
Walker, 2002													•	

Figure 4.2
Key References: International Baccalaureate Curricular & Program Goals

KEY REFERENCES <i>continued</i>	Standards-based	Assessment of key content, principles & concepts	Multiple questioning formats	Multiple types of assessment	Multiple assessments	Equal value on process & product	Student choice of product	Self-evaluation	Moderation by multiple experts	Rigorous
Golub, 2002			•		•					
Gubbins, 2002				•						
IBO Mission Statement (2003a)										•
IBO. (2002a).	•	•	•		•	•	•	•	•	•
Munro, 2002		•						•		
Nugent & Karnes, 2002	•	•	•	•	•		•			•
Silverman 1990		•								•
*VanTassel-Baska & Little, 2003	•	•	•		•	•	•	•	•	•
*VanTassel-Baska & Olszewski-Kubilius, 1989			•	•	•					

Figure 4.2
Key References: International Baccalaureate Curricular & Program Goals

KEY REFERENCES <i>Continued</i>	Flexibility of assessment & curriculum design	Interdisciplinary & integrated assessments & curriculum	Globalism	Problem finding & problem-solving	Group & independent student investigation	Advanced, rigorous assessment & curriculum	Inquiry activities	Differentiation for high cognitive processing	Breadth & depth of curriculum	Real world problems	Experiential learning	Self-regulated learning	Professional development	Child centered
	PROGRAM DESIGN													
Bechtel & Waterson 2003													•	
Duevel, 1999		•						•						
Gubbins, 2002	•	•						•						
IBO Mission Statement (2003a)		•	•			•		•	•	•				•
IBO. (2002a).	•	•	•		•	•	•	•	•	•	•	•		
Munro, 2002							•	•	•	•		•		
Nugent & Karnes, 2002	•	•	•			•		•	•		•			
Phillips,, 2002			•											•
*Renzulli & Reiss, 1985		•				•								
*Silverman 1990		•	•			•						•		
*Van Tassel-Baska & Little, 2003	•	•	•	•	•	•	•	•	•	•	•	•		
*Van Tassel-Baska & Olszewski-Kubilius, 1989	•					•		•	•			•		
Walker, 2002			•											
Wallace, 2002	•								•				•	

The references marked with an asterisk in Figure 4.2 are principally resources on gifted education. Although the data presented in them was primarily research based, the research was conducted on gifted education. Their treatment of the IB Program focuses on recommended practices for gifted education that are reflected in the IB curricular and program goals. This analysis intends to examine the alignment of those curricular and program goals with recommended practices for gifted and general education in order to apply practices recommended for effective instruction to IB teachers as well.

References: Recommended Gifted Practices

Therefore, the next step of the content analysis was to examine the key references (see Figure 4.1 Gifted Resources) for recommended gifted education practices in a manner similar to that conducted on key references for the IB in Figure 4.2. (References on recommended practices for general education were previously listed within the framework of Stronge's Model of Effective Teaching.). In the content analysis of gifted references only those recommended practices that were pertinent to IB curricular and program goals were examined. Figure 4.3 is adapted from Stronge, 2002.

Note: The 21 practices in Figure 4.3 Recommended Practices for Gifted Education were selected for comparison to IB curricular and program goals based upon the frequency of their recommendation in literature on gifted education. Practices that were discussed in four or more gifted resources were selected as recommended gifted practices.

Figure 4.3
Key References: Recommended Practices For Gifted Education

References	Recommended Practices																				
	Acceleration	Student choice	Real world problems	Prior knowledge	Interdisciplinary	Depth, breadth, & complexity	Conceptual	Differentiation	High expectations	Global & diverse	Professional development	Higher level thinking	Metacognitive skills	Variety of strategies	Student-directed	Open-ended	Authentic	Multiple types	Multiple assessors	Standards based	Product & process
Agne, 2001						•			•		•					•					
Callahan, 2001	•				•	•	•	•	•			•		•			•	•		•	•
Carnine, 1993		•	•			•	•					•		•		•	•	•			
Carper, 2002			•											•	•						
Feldhusen, VanTassel-Baska & Seeley, 1989		•	•			•	•	•				•	•	•	•	•					
Grant, 2002												•	•								
Gubbins, 2002	•			•		•	•	•			•							•			
Heath, 1997									•	•											
Henderson, 1996								•		•								•			
Johnsen & Ryser, 1996	•	•	•	•		•	•	•		•	•	•	•	•	•	•	•	•			•
Johnsen, Haensley, Ryser, & Ford 2002										•			•					•			
Kapusnick & Hauslein										•											
Lee-Corbin & Denicolo, 1998			•			•				•					•						
Maker & Neilson, 1996	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Rash & Miller										•				•							

Figure 4.3
Key References: Recommended Practices For Gifted Education

References	Recommended Practices For Gifted Education																				
	Acceleration	Student choice	Real world problems	Prior knowledge	Interdisciplinary	Depth, breadth, & complexity	Conceptual	Differentiation	High expectations	Global & diverse	Professional development	Higher level thinking	Metacognitive skills	Variety of strategies	Student-directed	Open-ended	Authentic	Multiple types	Multiple assessors	Standards based	Product & process
<i>Continued</i>																					
Renzulli, 1986, 1999		•	•	•		•								•		•	•	•	•	•	•
Renzulli & Reiss, 1985	•	•	•			•	•	•	•		•	•		•	•	•	•	•	•	•	•
Silverman, 1990	•													•							
Speed & Appleyard, 1985						•	•								•	•					
Stepanick, 1999	•	•			•	•	•	•	•			•	•	•	•	•	•	•	•	•	•
Sternberg & Grigorenko, 2002						•	•		•		•	•		•				•		•	
Torrance & Goff, 1990													•		•	•		•			•
VanTassel-Baska, 1993	•		•		•	•	•	•	•	•		•	•				•	•	•	•	•
VanTassel-Baska & Little, 2003	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
VanTassel-Baska, Zuo, Avery, & Little, 2002											•										
Westberg & Archambeault, 1997	•		•					•	•		•			•	•			•			

Note: Criteria for determination of recommended gifted practices required their discussion in a minimum of four studies. See note p.105.

Numerous recommended practices from each of the 6 Domains of the Stronge Model of Effective Teaching were discussed in the Review of Literature. In Domain 1: Prerequisites, recommendations for teachers included ongoing staff development (Johnsen, Haensley, Ryser, & Ford, 2002), teaching experience (Rash & Miller, 2000), and targeted training in the characteristics of gifted learners (Heath, 1997; Sternberg & Grigorenko, 2002). Domain 2: The Teacher as a Person described a confident, flexible, reflective teacher with high levels of teachers' sense of efficacy who could establish a relationship characterized by mutuality (Heath, 1997; Ross, 1994a) or equality (Silverman, 1995). Domain 3: Classroom Management and Organization emphasized the teacher's ability to multi task and organize a stimulating environment (Johnsen & Ryser, 1996; VanTassel-Baska & Little, 2003). With the exception of staff development, these characteristics are essentially teacher practices which Figure 4.1 IB Program References revealed were not adequately addressed in the literature on International Baccalaureate Program design. However, they are pertinent to the examination of teacher practices addressed in research questions 2, 3, and 4. A link established in Research Question 1 with recommended educational practices would enable the application of these other domain recommendations to teaching practices of IB teachers for the subsequent research questions.

As Domains 1, 2, and 3 practices proved not to be applicable to this examination of curricular and program goals, they were omitted from the content analysis. The list was, consequently, reduced to the 21 most commonly recommended practices for treatment in the content analysis in Figure 4.3. The resulting recommended practices were primarily from Stronge's Domain 4: Organizing for Instruction, Domain 5: Implementing Instruction, and Domain 6: Monitoring Student Progress and Potential.

Comparison: IB Goals & Recommended Gifted Practices

The next step in the sequential process was determining the alignment of IB curricular and program goals in Figures 4.2 with recommended gifted practices from Figure 4.3. Since the gifted practices were presented within the Stronge Model for general education, alignment would apply in that context as well; therefore, it could be concluded that the International Baccalaureate design would fit within and be assessed by Stronge's framework.

After examining the goal of high college and university acceptance, it was omitted from the analysis. College and university acceptance was determined to be an end-product of IB curricular and program design and not a component or practice of it. It is a goal presented by college and university admissions personnel and is not a goal presented in IB literature. Once that topic was excluded from the comparison with gifted education in Figure 4.4, many of the research based data sources were also excluded. The Program Design goal termed child-centered was also omitted from the content analysis. Analysis of child-centeredness lends itself to too much subjectivity; yet, its intent appears to be reflected in many of the other curricular and program goals such as student choice of product and self-regulated learning.

The Comparison of IB Curricular and Program Goals and Recommended Gifted Practices is presented in Figure 4.4. It is adapted from Stronge, 2002.

Note: Criteria for determination of recommended gifted practices required their discussion in a minimum of four studies. See note p.105.

Figure 4.4
Comparison of IB Goals and Recommended Gifted Practices

IB CURRICULAR AND PROGRAM GOALS	Comparison of IB Goals and Recommended Gifted Practices																						
	Acceleration	Student choice	Real world problems	Prior knowledge	Interdisciplinary	Depth, breadth & complexity	Conceptual	Differentiation	High expectations	Global & diverse	Professional development	Higher level thinking	Metacognitive skills	Variety of strategies	Student-directed activities	Open-ended activities	Student choice	Authentic	Multiple types of assessment	Multiple assessors	Standards based	Product & process	
<i>continued</i>																							
Use of feedback to self-evaluate product & process						•			•									•		•			•
Self-regulated learners		•							•														
Development of metacognitive skills						•			•														
Motivation to learn	•								•														
Standards based						•			•									•		•			•
Assessment of key content, principles, & concepts						•			•									•		•			•
Multiple questioning formats						•			•									•		•			•
Multiple types of assessment						•			•									•		•			•
Multiple assessments						•			•									•		•			•

STUDENT OUTCOMES

ASSESSMENT

Figure 4.4
Comparison of IB Goals and Recommended Gifted Practices

	ASSESSMENT										PROGRAM DESIGN											
IB CURRICULAR AND PROGRAM GOALS																						
<i>continued</i>																						
Equal value on process and product																						
Student choice of product																						
Self-evaluation																						
Moderation by experts																						
Flexibility of curriculum & assessment design																						
Interdisciplinary & integrated assessments & curriculum																						
Globalism																						
Problem finding & problem-solving																						
	Acceleration	Student choice	Real world problems	Prior knowledge	Interdisciplinary	Depth, breadth & complexity	Conceptual	Differentiation	High expectations	Global & diverse	Professional development	Higher level thinking	Metacognitive skills	Variety of strategies	Student-directed activities	Open-ended activities	Student choice	Authentic	Multiple types of assessment	Multiple assessors	Standards based	Product & process

Figure 4.4
Comparison of IB Goals and Recommended Gifted Practices

	IB CURRICULAR AND PROGRAM GOALS <i>continued</i>	Acceleration	Student choice	Real world problems	Prior knowledge	Interdisciplinary	Depth, breadth & complexity	Conceptual	Differentiation	High expectations	Global & diverse	Professional development	Higher level thinking	Metacognitive skills	Variety of strategies	Student-directed activities	Open-ended activities	Student choice	Authentic	Multiple types	Multiple assessors	Standards based	Product & process		
PROGRAM DESIGN	Group & independent student investigation		•	•			•		•			•	•	•	•	•									
	Inquiry activities			•			•	•	•	•	•	•	•	•	•	•	•								
	Differentiation for high cognitive processing	•					•	•	•	•			•	•	•										
	Breadth & depth	•		•	•			•	•	•		•	•											•	
	Real world problems			•		•	•	•	•	•	•	•	•		•				•						
	Experiential learning		•	•				•		•		•	•	•	•	•	•		•						
	Self-regulated learning	•	•							•			•	•	•	•		•	•						
	Advanced, rigorous program & curriculum	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Professional development training		•										•												

The analysis depicts the alignment of recommended practices for gifted instruction with 12 IB Student Outcome goals, 9 IB Assessment goals, and 13 IB Program Design goals.

- Authenticity of assessment was a frequent match to the goals of program design
- The opportunity to develop higher level thinking was vital to all three goal areas.
- Establishing high expectations was noticeably evident, matching to 32 goal areas.
- Depth, breadth and complexity, recommended for gifted curriculum and assessment, matched to 35 goal areas.
- Acceleration most frequently aligned with program design goals.

The IB Program Curricular and Design goals that aligned most frequently with recommended practices were:

- High cognitive processing
- All assessment goals
- Problem-finding and problem-solving
- Advanced rigorous program and curriculum.

The sequential process of the content analysis indicated that IB Curricular and Program goals align with research based recommended practices for gifted and general education. It does not suggest that IB practices have been treated to research.

Comparison: Program Requirements and Gifted Practices

The final step in the sequential process was to align the program requirements described by IB curricular and program goals with the recommended practices used in the sequential content analyses. The major program requirements described in the Review of Literature were the subject groups of the curriculum, program components, and assessment. The specific elements of the three program requirements are:

- Curriculum
 - Humanities
 - Math/science
 - Higher level and standard level courses
 - 2-year courses of study
 - International perspective
- Components
 - Theory of Knowledge
 - Creativity, Action, and Service (CAS, community service)
 - Extended Essay
- Assessment
 - Internal
 - External

Figure 4.5, A Comparative Analysis of IB Program Design & Recommended Educational Practices (adapted from Stronge, 2002) depicts that alignment.

Figure 4.5
A Comparative Analysis of IB Program Design & Recommended Educational Practices

INTERNATIONAL BACCALAUREATE PROGRAM DESIGN	RECOMMENDED PRACTICES FOR GENERAL & GIFTED EDUCATION																				
	Acceleration	Student choice	Real world problems	Prior knowledge	Interdisciplinary	Depth, breadth & complexity	Conceptual	Differentiation	High expectations	Global & diverse	Professional development	Higher level thinking	Metacognitive skills	Variety of strategies	Student-directed	Open-ended	Authentic	Multiple types	Multiple assessors	Standards based	Product & process
CURRICULUM																					
Humanities	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				•	•
Math/Science	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				•	•
Higher & Standard Level	•	•				•		•	•		•	•	•								
2-year course study						•	•				•	•	•	•							
International perspective									•	•	•										
COMPONENTS																					
Theory of Knowledge			•	•	•	•	•	•	•	•	•	•	•	•	•	•					
CAS (Community Service)		•	•					•	•	•	•	•	•	•	•	•					•
Extended Essay	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•					•
ASSESSMENTS																					
Internal	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
External (end-of-course)	•		•	•	•	•	•	•	•	•	•	•	•				•	•	•	•	•

Note: Criteria for determination of recommended gifted practices required their discussion in a minimum of four studies. See note p.105.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

To clarify international terminology, the internal assessments are those assessments required by the IB Program in addition to external assessments (end-of-course exams). They are facilitated and assessed by teachers and sent to the IB Organization for review (IBO, 2002c). An example of the internal assessments is the science interdisciplinary experiment, called the Group 4 Project, designed and completed by students. Students are assessed for the process and their analysis of the process they conduct rather than on successful results they may or may not achieve (IBO, 2001). External assessments are end-of-course examinations examined by outside evaluators according to criterion-referenced standards. Each assessment includes a major writing or essay component (IBO, 2002c).

Summary of Research Question 1

The analysis indicates that the International Baccalaureate Program requirements as well as the IB curricular and program goals align with the recommended practices for gifted and general education. The sequential process depicted in the narratives and in Figures 4.1 through 4.5 indicated the areas of alignment between gifted and general education and the IB as it is described and designed. However, the applicability of the analysis applies only to the intent of the program - its requirements and goals and program requirements. The actual implementation of the recommended practices by IB teachers in the classroom will be examined in research questions 2-4.

Research Question 2 Results

Research Question 2: As determined by observation to what degree do teachers of International Baccalaureate students exhibit effectiveness behaviors in their implementation of instructional skills and in their levels of complexity in questioning?

Procedure

The researcher conducted 10 observations using a scripting procedure in which each teacher activity, question, instruction, and behavior was recorded. The scripts were analyzed on teacher implementation of five Instructional Skills within Domain 5: Implementation of Instruction of the Stronge Model (2002). These five Instructional Skills are:

- I-1 Instructional Differentiation
- I-2 Instructional Focus on Learning
- I-3 Instructional Clarity
- I-4 Instructional Complexity
- I-5 Expectations for Student Learning

Although the researcher observed for implementation of the five instructional skills, the focus of the observations was on the instructional strategies implemented in the classroom. The narratives describing teacher practices will be more detailed for teacher practices in skill I-1. Within the thick descriptions of instructional strategies will be evidence that clarifies teacher behavior concerning the other four skills. The ten teachers were coded as T1 through T10.

For example, a teacher, T8, who implemented a pattern of low and high level questioning, engaged each student in a Socratic questioning session. That teacher used questioning as the format for instruction and guided practice to clarify concepts and check for understanding. This format addressed five instructional skill areas.

Teacher performance on the five Instructional Skills was rated using the Teacher Effectiveness Behavior Scale (Stronge & Tucker, 2001), a four-level behavioral summary scale. This scale was used by Stronge, Tucker, and Ward (2002) in a study of the instructional practices of effective and ineffective teachers. The use of this instrument allows for a limited comparison

of means and standard deviations in the areas of instructional differentiation, focus on instruction, clarity, complexity, and expectations for student learning. The Teacher Effectiveness Behavior Scale Area I: Instructional Skills can be found in the Appendix.

The scripts were analyzed for behaviors that corresponded to each instructional skill. The behaviors for each skill were coded and extracted from the scripts and recorded separately on a data recording form for each teacher. The Level 4 descriptor and the teacher behaviors for each skill were subsequently extracted from each data recording form and summarized on individual instructional skill recording forms. Teacher practices and behaviors were treated to additional analyses for identification and coding of themes and determination of recurring patterns.

Each teacher was awarded a rating of 1-4 based on the 4-Level Behavior Scale. From these ratings the means and standard deviations were computed, which allowed for a limited comparison with a prior study by Stronge, Tucker, and Ward (2003) of effective and ineffective teachers. It must be noted that the data on the Stronge study is provided only as an exploratory case analysis. The exploratory case analysis was conducted in 85 third grade classrooms one week prior to administration of Virginia Standards of Learning tests while the data on IB teachers was conducted in 10 classrooms four months before external assessments. However, internal assessments were being or had been conducted by IB students. The comparison will be presented separately as each skill is discussed.

Performance indicators were used as guides to facilitate a less subjective analysis of teacher performance in each dimension. Teachers were not assessed based on their performance on every indicator. The indicators were derived from the Teacher Effectiveness Rating Form (Stronge & Tucker, 2002). Additional strategies corresponding to those recommended for gifted

education were derived from VanTassel-Baska and Little (2003). They will be enumerated as each skill is discussed.

The 60-90 minute observations permitted only a snapshot of the teachers' total performance. Therefore, teachers were rated only on those strategies implemented within that period of time. Although teachers often referred to ongoing investigative activities, they were considered to be long-term assignments and, therefore, will be discussed in Research Question 3 on Assessment Practices.

Due to the observer's involvement as coordinator in the IB Program in School B, the role of participant/observer was assumed. The researcher's involvement in the school assisted in reducing the time to win the trust of participants.

Instructional Differentiation

The first Instructional Skill to be assessed and the primary focus of the research for Research Question 1 was I-1 Instructional Differentiation. Although teacher implementation of the other four instructional skills (instructional focus, clarity, complexity, expectations) is addressed, more emphasis and the preponderance of the narrative will be presented for the skill of Instructional Differentiation. While the researcher intends to develop a profile of the IB teacher, the focus was on the strategies implemented in the classroom.

The Level 4 descriptor and performance indicators for I.1 Instructional Differentiation are:

Area I: Instructional Skills

I-1 Instructional Differentiation

The teacher uses a broad repertoire of instructional strategies with fluency and flexibility to differentiate instruction for individual or groups of students.

Sample Performance Indicators:

- a. uses a variety of instructional strategies and activities to promote student engagement
- b. The teacher uses questioning strategies to engage students and promote learning (engagement).
- c. summarizes and reviews major concepts from the lesson (Stronge & Tucker, 2002)

The Teacher Effectiveness Behavior Scale: Instructional Skills with descriptions of all four levels can be found in the Appendix.

Differentiation through the implementation of a variety of strategies creates optimal learning opportunities and, therefore, engagement for all students (Bransford, Brown, & Cocking, 2000) whether in a gifted or general education setting. The majority of instructional strategies are applicable to all disciplines while certain strategies are particularly appropriate in individual disciplines. Questioning strategies are valuable to all disciplines as are hands on learning activities, although hands on activities have particular application to science as do manipulatives in math (Joyce, Weil, & Calhoun, 2000).

The targeted instructional strategies, derived from Stronge (2002) and VanTassel-Baska and Little (2003) were direct instruction, inquiry-based and discovery activities, group work, independent work, questioning strategies, problem solving and problem finding activities, and teacher integration of technology. The questioning strategies considered included question and answer, reflection of student responses, and Socratic questioning.

Particular strategies, such as direct instruction, lend themselves to the incorporation of other activities. Direct instruction is characterized by lecture, controlled and/or guided practice, and independent practice and, therefore, allows whole group, small group, and individual approaches through one instructional strategy (Joyce, Weil, & Calhoun, 2000, VanTassel-Baska, 2003). Thus the teacher may implement several instructional strategies within a single block of time.

Once again, it is important to note that teachers were not assessed for their implementation of each and all of the performance indicators. The indicators were simply used as tools to target preferred approaches.

The observations revealed that teachers implemented several strategies during the class period or block; however, each teacher focused on one major strategy in which other strategies were imbedded. This major strategy was the primary format for teacher/student interaction by which lesson information was communicated. It, therefore, framed the pattern of instruction and will be termed as the framework for teaching. The frameworks for teaching were primarily direct instruction, questioning, and problem solving. Imbedded within the framework of direct instruction could be rapid question and answer, small group or individual work, or a problem-solving activity.

Although the framework included several strategies, student activity did not vary to a great extent. The variety of student activities will be addressed first, followed by an examination of the variety of teaching strategies practiced by each teacher.

Instructional Framework and Student Activity

The class was conducted according to a teacher's framework which occupied the majority of the class time. For example, a teacher whose instructional framework was direct instruction constructed class time as follows:

- procedural details – returning work, discussion of homework or prior test
- orienting activity - whole class discussion of a specific aspect of content or an individual seatwork activity
- whole class instruction on and discussion of lesson

The first two activities lasted from 5-15 minutes and the final activity took the remainder

of the period or block. Two classes were 60 minutes while eight classes occupied 90 minute blocks. Therefore, students were engaged in the same type of activity, usually a whole group activity, for up to 75 minutes. During that activity the teacher implemented a variety of strategies in which the students listened, took notes, answered and asked questions. For each of the classes in which this was the pattern, student attention was observed to be at a high level. In four of the six classes outlined below student attention diminished towards the last 15 minutes of class causing the teachers to draw student attention back to the topic.

- T1: procedural details, orienting activity = individual seatwork, Socratic seminar (internet presentation planned but blocked by district firewall)
- T2: procedural details, orienting activity = whole class discussion, Socratic seminar
- T6: procedural details, orienting activity = individual seatwork, direct instruction with question and answer
- T7: procedural details, orienting activity = direct instruction with question and answer
- T9: procedural details, problem solving independently and in small groups with direct instruction

Four teachers involved students in markedly different types of activities during the class period.

Each of the activities lasted from 20 – 45 minutes each.

- T3: Activity 1 = small group problem solving and reporting out activity; Activity 2 = direct instruction with question and answer.
- T4: procedural details, Activity 1: quiz, Activity 2 = inquiry activity/small group outdoor lab
- T5: procedural details, Activity 1: quiz, Activity 2 = whole group problem solving activity

- T8: orienting activity = whole class discussion, Activity 1 = Socratic seminar, Activity 2 = small group problem solving activity, Activity 3 = whole class planning for internal assessment
- T10: procedural details, Activity 1: direct instruction with question and answer, power point outline, and video, Activity 2: individual seat assignment and direct instruction, Activity 3: whole class test review

In six of ten observations student activity varied minimally; however, students were attentive and actively participated for the majority of class time. From observation the high level of attention appeared to be resultant of the varied instructional strategies, complexity of material, and high expectations for achievement. The various instructional strategies that constructed the instructional framework of each teacher are described below.

Direct Instruction

Eight of the teachers implemented direct instruction but to varying degrees. For four of those teachers (T3, T6, T7, and T10), direct instruction was the primary form of instruction; and it is, therefore, described as the framework for the lesson. Imbedded within the framework, the teacher incorporated other strategies, most markedly questioning which often served as guided practice after or during short lectures.

T10, a science teacher, used several activities within the framework of direct instruction. T10 began the class period by focusing the students on the subject of the lesson. After saying, "Prepare for a power point on periodicity," a brief discussion ensued in response to a student's question about an after school meeting for the Group 4 Project, an ongoing investigative internal assessment described previously in Research Question 1. The lecture with the incorporation of questioning then proceeded. The questioning sessions, interspersed during the lecture, acted as

guided practice for concept building through discovery. A series of questioning is presented

below:

What is wave length? What do we remember about a wave? What's a trough? What units typically measure a trough?....Typically what is frequency measured in? There is a relationship between wave length and frequency. What is it?... Which do you think will be faster or easier, using an instrument or a dye?...Why do some bonds form and others do not?

Each question was preceded by a series of student answers. However, when students could not recall prior learning required to make a connection to a new concept, rather than providing the answer, T10 gave them time to find the information for themselves in the text.

Have we figured it out? (student responses.) That's the most useful (comment on student answer). Why? Then we as chemists...what are we talking about? What do we use wave length to describe?

However, the teacher provided the answer to some questions or guided the students to discover the answer for themselves.

T10: What do you think will be faster and easier? Using an instrument or a dye?

Student answers.

T10: A continuous spectrum of light ...where would it go? (no answer, the teacher explains)

Student question.

T10: That's a good question. How can I get to the answer without giving away my entire lecture?

The instructional framework implemented by T10 followed this pattern:

- Lesson 1: power point lecture
 - introductory question and answer review of prior lessons pertinent to understanding the new concept.
 - student note taking
 - questioning interspersed during lecture.
 - lesson summary

- Lesson 2: power point lecture
 - teacher and student questions and answers during lecture.
 - video lab demonstration and animated diagram
 - student questions and comments during lab demonstration.
 - teacher questioning
 - individual assignment – lesson summary
 - lesson summary through questioning on student findings

T3, a history teacher, began direct instruction with a small group problem solving activity. The group reports of their findings were punctuated with probing teacher questions. At the conclusion of the activity, the teacher gave a brief lecture on the topic, explaining the purpose and process of the activity which was linked to the internal and external assessments. After this 45 minute activity, T3 lectured on a different topic, supplemented with an outline on overhead transparencies, while students took notes. The short periods of lecture were interspersed with a rapid series of questions as guided practice.

This is the second Great Awakening. What was the 1st Great Awakening? (student response) Absolutely!

The teacher added more information, then continued with the questioning. Student answers followed each question.

“Deisu”...what is it? What does that mean? The divinity of Christ? Keep going. What is it all controlled by? Okay, wonderful! What is the impact? Predict! What will happen? Where? What started happening? Explain the difference in the 1st and 2nd Great Awakenings. Is this the case today? Is religion an important part of life? Give me evidence.

The instructional framework implemented by T3 followed this pattern:

- Lesson 1 - small group problem solving activity
 - student report out findings

- teacher probing questions
- teacher lecture
- lesson summary
- Lesson 2 - lecture with overhead transparency notes
 - introductory question and answer review of prior lessons pertinent to understanding the new concept.
 - student note taking
 - questioning interspersed during lecture
 - lesson summary

Both teachers asked probing questions that guided student discovery of concepts. They responded to student answers and questions by inviting further student responses after which they provided further explanation of the concept. They provided some answers; however, in most cases, they first used questioning to guide students to discovering the answers themselves. This form of guided practice was as primary a component of direct instruction as was lecture.

T6, a history teacher, followed a similar process, opening class with an orienting seat assignment that served as the context for the lesson. Prior to presenting the lesson, the teacher and students discussed current events. The teacher then presented the major, topic using an outline on the blackboard as a guide for the lecture. The vignette below, taken from the observation script, opened with a question. It is typical of the majority of the class period.

“What are international organizations?” After one student example, the teacher asked, “Any others?” After several more students gave examples, T6 lectured on the first section of the outline while students took notes. The teacher then asked, “Why am I not an international organization? I have interests that cross boundaries.” Several students responded and a question and answer session and informal discussion ensued.

The instructional format implemented by T6 was similar to that used by the prior two teachers:

- opening orienting activity as review or preview
- lecture using a media form
- student note taking
- question and answer

A different approach to direct instruction was taken by T7, an English teacher. T7 focused on the lecture aspect of direct instruction while including questioning. Rather than asking probing questions that lead students to discover lesson concepts, T7 asked questions as a stage setter or focusing strategy prior to providing the information for the students. As a stage setter or focusing strategy, lower and higher level questions were asked to focus the students on the topic which the teacher explained.

The lesson consisted of oral reading of a play; the teacher and each student had parts. The days reading was introduced with a teacher review of the events read in the previous class. A passage was read after which T7 asked comprehension questions about the characters and then explained the passage.

Each teacher question in the following vignette is preceded by a one or two word student response. The passage is read and the teacher conducts an explication of it.

I hope you understand that. Who is Polonius? What is his job? Hamlet is the future---? (T7 explains the passage.) The action is daring but is it pleasant? (T7 answers.) It is metaphorical to say ---.

Another similar explication went as follows:

Who is the murderer? (student answer) Rumor is he was killed how? (no answer) It says right here. (student answer) T7 explains an alternate interpretation. Extreme unction ...what is it? (no answer) T7 explains. That's where you find out extreme unction had not taken place.

The students seemed comfortable with the teacher and appeared to rely on the explications of the passages as evidenced by their questions about the passages and comments on the explication. T7 answered the questions rather than deflecting the questions to other students or using guided questioning to lead students to discover the answers.

Although the majority of the lesson was typical of the above two vignettes, students also participated in short conversation-type discussions with the teacher. This was more frequent during the last 30 minutes of the 60-minute class period and after their lunch break. The teacher paused after passages were read.

T7: What do you call it when he is on stage? What is the area below the stage called?

Student answers.

Student: Is he scared? T7: Whose fault would it be? What do you think? I would say yes.

Student answers.

T7: The more important parts in there are ----?

A discussion, more like an informal conversation, followed this question. However, the discussion sessions were not as discovery oriented (one discovery experience took place) or as fast paced, and student engagement was not as intense as with teachers T3, T6, and T10.

Students occasionally put their heads on their desks with T7 while that was not the case with the other three teachers.

The instructional framework implemented by T7 followed this pattern:

- review of prior lesson
- oral reading of play passage
- teacher questions
- teacher explication of passage

Questioning

Each of the 10 teachers incorporated questioning strategies into their lessons, however, for three teachers (T1, T2, and T8) the strategy served as their instructional framework. Although slightly different teacher roles were adopted, all three used the Socratic seminar model which became the instructional framework of their lessons.

- An initial reading of a literary selection, a philosophical passage, or historical document prior to engaging in the seminar.
- Every student participates.
- Student wait time is allowed before answering.
- Probing questions are asked by teacher and student,
- The teacher periodically summarizes the major concepts (VanTassel-Baska & Little, 2003).

Socratic questioning. T1, a Theory of Knowledge teacher, implemented the Socratic model by reflecting rather than commenting on student answers. The teacher resisted contributing a personal point of view to avoid influencing students. At the beginning of the seminar, T1 stated, “I will refrain from commenting until we hear what you all have to say.”

The opening orienting activity consisted of a question referring to their prior reading and the topic of the seminar, “Can you trust your senses?” To organize their thoughts the students were directed to write their thoughts in their journals. Additionally, although guided questions lead to student summaries, the summary of major concepts by the teacher was presented at the end of the discussion.

After 3-4 minutes of journaling, the teacher asked, “Okay, anybody comment?” Active questions and answers ensued with the teacher writing key words from student questions on the

board with the comment, “Let me put that down (on the board) because we will address that question after we get the others’ perspectives.”

The following vignette from the observation script describes a typical question and answer session.

A student brings us the term “a priori knowledge.”

T1: Is there anything that defines that...a priori knowledge? Define or give an example so everyone knows what you are talking about.

Student explains.

T1: Your bookbinder is black. Is that a subjective or objective example?

Several students respond.

Student question: But is it really the truth?

T1: Hold onto the definition of truth. Do you see it as a different color? Do you see it as a color physically there or do your senses fool you? Or is it your brain’s ability to interpret?

Students answer.

T1 reflects last student answer. Student begins to continue speaking.

T1: Let these two answer; then you can comment.

In addition to the questions and answers, a discovery activity was conducted in which pairs of students performed an experiment that illustrated the lesson about trusting one’s senses. Students often asked questions to which other students responded while the teacher observed and nodded.

In implementing the Socratic model T8, an English teacher, involved each of the 12 students in the questioning session. The context of the lesson was the reading of a short story. The lesson began with the teacher and students reviewing the reading from the prior class. The pattern of the instructional framework was:

- Student reading of a short story passage
- Teacher asking probing lower level and higher level questions.
- Teacher or student summary of passage
- Student small group activity as summary of lesson
- Student reporting of findings.

Frequently, the teacher summarized the story and concepts after explication of several passages or led the students to summarize them through guided practice. The teachers and 12 students sat in a close circle, and each student was called on repeatedly to respond. This structure, along with the rapid pace of questioning, fostered active engagement during the entire lesson. Every student read and answered questions either voluntarily or by direct teacher questions. Upon giving the final activity, a student assignment to evaluate the story, the teacher walked away from the seminar circle to work at the desk. The assignment was treated by the students as a challenge. One student said, "Let's go guys," and the students proceeded to evaluate the story in teams they formed themselves.

T2 followed a similar procedure but in class without oral reading. Students had read and written commentaries on the selections prior to class time. T2 initiated the Socratic questioning with a visual for students to connect symbolically to the selections. After reviewing poetic elements in the poetry, the teacher fostered student engagement in the questioning process by calling on other students to comment on and extend the ideas offered by other students. The following vignette exemplifies the teacher's method of reflecting student comments and ideas to other students:

T2: Why don't we continue that idea begun by ---- (student)? Anything in this idea? Elaborate on it. (Students comment and refer to the concept of sadness in the poem.) T2: Is there anything to counteract that sadness? (Students respond.) T2: Do you ever write poetry? (Students answer.) T2: To the person you love?

Reflection of student questions. Although the majority of the teachers answered student questions and expounded on student answers, reflection of student responses or questions was a tool used often by T1, T2, and T6. Rather than answering students' questions, these teachers used the opportunity as a springboard to extend conceptual understanding. In response to student answers or questions, teachers summarized student responses, and then added:

- T1: Is that what you're telling me?
- T2 and T6: What do you think?

This practice is supported by Silverman's (1995) research on teachers of gifted students. The researcher found that reflection of student answers and questions promoted student engagement, problem-solving, and higher-level thinking.

Levels of complexity in questioning. Questioning at all levels of complexity is a component vital to achieving the goals of advanced education (Gubbins, 2003; Hansford, 1985). Opening a Socratic seminar with a question at the highest levels of complexity will lead students to discover significant details for application to and support of conceptual understanding. However, each level is vital to concept development and full understanding of the material (VanTassel-Baska, & Little, 2003). Levels of complexity in questioning refer to the levels of Bloom's Taxonomy of the Cognitive Domain. The levels in order of complexity from least to most complex are: knowledge or recall, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956). During the observations each of the ten teachers asked questions that varied among the levels of complexity.

In 60 minutes of the Socratic seminar, T8 asked 147 questions at a rapid pace, varying between levels of complexity. The pattern in the following vignette was typical of the lower and higher level questioning that occurred.

Is he greedy? What is he thinking about doing? Where is he going to go? What makes him think he can deal with these people? What had he done? What is he negotiating? What is he doing? When you feel good what is part of that feeling good? Then someone gets a -----; does it bother you? A good salesman makes you think of what? Is he going to love money?

A second vignette varies from comprehension to knowledge to higher level questions.

So why was he so generous with his land? What does tilling ground have to do with eating bread? Can you own land? Or does the land own you? Why is he so interested in the deal?

Student answers and/or discussions followed each of the questions.

Recall questions were used to enable students to connect prior learning to new concepts as in this example from T7.

Do you remember “Apollo’s Creed”? (No one remembered.) T7: Explains and compares to reading. T: How does he say it? T: answers. He was really doing this in love, right? Student answers. T: Any of this advice bad? T: No! (Teacher explains.) Do you understand? (explains)

T2 also asked recall questions connected to prior learning. In a Socratic seminar, T2 asked the students to identify elements of a poem that romanticized nature and to incorporate references to Transcendentalism learned at the beginning of the year.

In describing the behavior of a Shakespearean character, T7 asked what was said, how it was said, and for the students to conjecture about the motivation behind what was said. T6, a history teacher, followed a similar pattern, asking what international organizations were, to give examples, and to differentiate between them and other types of organizations.

All ten teachers used a combination of recall and complex levels of questioning to introduce concepts, relate them to prior learning, and promote critical thinking and exploration of concepts. Seven of the ten focused more on comprehension and higher level questioning. Three teachers – an English teacher, a science teacher, and a math teacher - focused on asking as many recall questions as comprehension and higher level questions.

Problem-solving

Problem-solving and inquiry-based activities are student-directed activities that allow students to control their learning through identifying what they know about a situation, what they need to know, and exploring the problem in teams. Student teams determine and delegate

relevant information to be collected by team members, although inquiry-based activities may also be conducted individually (VanTassel-Baska & Little, 2003). The observations revealed different types of these activities: shorter problem-solving activities and investigative or experimental activities. Therefore, the researcher separated problem-solving and inquiry-based activities (experimentation) as described below.

For the purposes of this paper, the researcher differentiated between problem-solving and inquiry/discovery activities by the extensiveness of the assignment and the process students were required to conduct. Problem-solving activities were considered to be those in which students were presented with a problem that needed to be solved. A problem solving activity followed this process:

- presentation of a problem
- small group or individual problem solving activity
- student reporting of findings

Inquiry/discovery activities, which are described below, was defined as:

- hands on discovery activities requiring active experimentation
- ongoing student-directed extensive investigation

The problem-solving activities identified in the observations included:

- T5 and T9: solving math problems
- T1: exploring sensory perceptions
- T3: evaluating the objectivity of print materials
- T8: evaluating the quality of a short story
- T10: connecting prior learning to analyze or solve a problem presented by a new concept

(One of T10's problem solving activities was described above under direct instruction.)

Problem-solving was the instructional framework for both math teachers (T5 and T9) and, to some degree, also T3. T3 had two 45 minute activities marked by two distinct instructional frameworks. The first framework was a problem solving activity conducted in small groups, followed by direct instruction with question and answer.

Lecture and questioning were incorporated during the problem-solving activities for T5 and T9. Both math teachers' classes used calculators; however, only T5 also used the calculator and gave instruction on its use for the problem-solving procedure.

T9 began with an activity of problem-solving and questioning which concluded with a lecture on the process. As class opened, students asked about the format of the upcoming mid-term exam. The teacher then turned to a discussion of the homework with the students presenting the problems that were most difficult for them. For each homework problem, T9 wrote a similar problem on the board for students to solve in groups and moved from group to group asking questions about the process students were using. Upon determining that all students had completed the problem, a questioning session ensued. Students were called to the board to demonstrate and explain the problem solving process they used.

Active student engagement was limited to six students in the small class of nine. The participation of the other three students was limited to individual responses to the teacher during small group and independent work. They did not volunteer and were not called on to participate in the whole group activities.

T9 concluded each problem solving activity with a lecture explaining and summarizing the process just conducted.

The instructional framework followed by T9 was:

- presentation of problem

- small group or individual problem solving activity
- teacher circulating and questioning each group
- teacher questioning
- student demonstration of solutions
- teacher demonstration of solution
- teacher lecture on the process

T5 and students conducted the problem-solving activities independently then discussed it as a whole class activity. Initially T5 gave instructions on the calculator procedure that would enable them to solve the problems. The students and the teacher proceeded individually to solve a series of problems previously written on the white board. Upon completing each problem, the teacher asked a series of questions to probe the process of problem-solving followed by the students.

It should be what? Did you go to stats? Did you get Sort A? Now can you answer elementary statistical questions? What is the mode? Who remembers? Sometimes more than one number, right? You can either ---- or ----. What is the mode? Everyone agree with that?

The teacher assisted individual students who were experiencing difficulty by asking probing questions such as “What’s wrong? What is the problem with that?” Rather than explaining how to solve individual problems, the strategy of guided practice enabled student discovery.

The instructional framework followed by T5 was:

- Problem presented on the board
- Teacher explanation of calculator process
- Individual problem solving
- Teacher whole group questioning

- Individual assistance by teacher
- Teacher whole group questioning

Another problem solving activity was conducted by T3. At the beginning of the class period, T3 assigned a timed activity in which the students evaluated written historical sources which they had not previously seen. Their goal was to discover the objectivity of the source by examining the origin, purpose, value, and limit of the document. Groups of two to three students were given 15 minutes while the teacher circulated to the various groups. The following vignette from the observation script is typical of teacher and student interchanges.

T: (to one group) Connect. The author is from...? Group: UVA. T: Can you say anything bad about Thomas Jefferson if you're from UVA?

To another group, T3 had this interchange:

Student question. T: Is that a value or an interpretation? Student question. T: Does it? That's what I'm asking you.

At the conclusion of the timed activity the students reported on their findings.

T1 assigned an unusual activity during the discussion of the ability to trust sensory perceptions; however, the framework for T1 was questioning (see above). In several experiments to determine whether senses can be trusted, students, individually and in pairs, determined what they perceived they saw with their eyes closed. The first time with the lights on and the second time with the lights turned off. T1 gave these instructions:

Try a little experiment. Close your eyes. Put your right hand to your face and wave it back and forth. How many can see their hand wave back and forth? Even with your eyes closed?

In the last experiment on the problem of trusting sensory perceptions, students conducted the activity in pairs. One student waved a hand in front of another student's closed eyes to determine any difference in perception. T1 concluded the activity with questions to tie the activity to the Socratic seminar concept:

Could anyone see the other's hand in front of their face? Now, what are we trying to get at here? Is what you see determined by your senses or by what you know is happening or both – a priori knowledge of what happens?

Inquiry/discovery

Inquiry/discovery activities were similar to problem-solving activities. Both strategies allow students to control their learning through discovery of what they need to know and following that problem through with investigation. Both types of activities can be conducted individually or in teams. (VanTassel-Baska & Little, 2003). For the purposes of this paper, the researcher differentiated between inquiry/discovery activities and problem-solving activities. While problem solving activities were shorter term activities conducted and presented individually or in small groups, inquiry/discovery activities were conducted over a longer term. Inquiry/discovery activities were defined as:

- hands on discovery activities requiring active experimentation
- ongoing student-directed extensive investigation

Inquiry/discovery was the instructional framework for T4 who conducted two scientific experiments.

The instructional framework implemented by T4, a science teacher, was inquiry/discovery, as evidenced in the focus on scientific experimentation during the majority of the class block. The teacher began with a review of ongoing assignments, including their science fair projects and a writing assignment. Using a television monitor listing the lesson topic and the major activities planned for the day, the teacher previewed the day's activities. The students and the teacher planned the set up for a future lab, and the teacher reminded students of a make up lab to be held immediately after school. Two labs were to be conducted during that class block – an ongoing outdoor lab and an experiment on the day's topic. However, due to an extensive fire drill the period before, the class was shortened from 90 to 60 minutes, thus eliminating the

second lab. Students took a 15 minute quiz after the preview. As they completed their quizzes, individual students took equipment (shovels, meter sticks, etc) and proceeded to go outside in teams to examine their labs. The teacher did not have to give instructions on what equipment to take with them. The script recorded this vignette on the outdoor lab.

As we walk outside, the teacher asks a student team to explain their lab. They explain that they are conducting a long-term analysis of natural changes in a designated area. They describe their lab in detail. Students set out measuring and gathering data. Different members have different responsibilities. The teacher does not have to give directions or caution them to get to work.

Teacher was concerned about the effects of Hurricane Isabel and considered cleaning up the damage, but decided that it was a part of the natural changes of the land.

On the walk back, a student had a question, a dilemma about her lab.

Teacher: Is that a biotic occurrence? Student answers.

Teacher: Should you consider that?

Teacher direction was minimal, including directions on conducting the outdoor lab and responses to student questions. Questioning encounters, exemplified by the brief questioning described in the vignette, served as a strategy to guide the students to discover solution on their own. The complex nature of the lab and the responsibility of the students to manage their labs and record their data indicated more about the teacher's instructional skills than did the teacher's observed behaviors.

Technology

The major criteria I established for this instructional strategy was the incorporation of technology, specifically the incorporation of the computer, into the lesson. Computer use was specified as:

- use of the internet as part of the lesson
- teaching a lesson through power point or other computer program

The teacher who met these criteria during the observation was T10 whose

activities were described above. T1's internet activity, as stated, had been blocked by the district's fire wall. Each teacher in School A had the day's lesson on a power point slide on the large monitor at the front of the room. However, in an interview, the IB coordinator stated unequivocally that she had observed repeated incorporation of power point demonstrations and internet use integrated into the lessons of each of the teachers. Teacher T3 had not been observed to that point. However, T3 used a power point slide to introduce the lesson and overhead transparencies to teach the lesson.

Each teacher in the county school had a computer with a large "destination unit" on which to project computer programs, an advantage that teachers in the urban school did not have. However, all teachers in the urban school had access to the same equipment as did T10 who made extensive use of it.

As stated, both math teachers used calculators in their classes. T5, however, worked the problems on the calculator with the students and instructed them step by step on its use as new concepts were introduced. Technology was defined as the teacher's purposeful integration of technology into the lesson. Therefore, by using and instructing on the use of the calculator, math teacher T5 incorporated technology into the teaching while math teacher T9 did not.

Summary

Through the observations it was discovered that teachers implemented a variety of instructional strategies while variety in student activities was limited. Six of the ten teachers engaged students in one major type of student activity for the major portion of the class, most predominantly a whole group activity. Four teachers varied activities by engaging students in two or more activities of similar time duration.

The patterns that emerged from analysis of the observation data on the instructional differentiation practices of IB teachers are depicted in Figure 4.6.

Figure 4.6
Instructional Skills: Patterns of Instructional Differentiation

Teacher	Instructional Strategies								Instructional framework/ Primary emphasis in classroom
	Direct instruction	Inquiry/discovery	Questioning	Socratic questioning	Problem solving	Technology	Group work	Independent work	
T1				•	•	•	•	•	Socratic questioning
T2	•			•		•			Socratic questioning
T3	•		•		•	•	•		Problem solving, Direct instruction,
T4		•	•			•	•		Inquiry/discovery
T5	•		•		•	•		•	Problem solving
T6	•		•					•	Direct instruction
T7	•		•						Direct instruction
T8	•			•	•		•		Socratic questioning
T9	•		•		•		•	•	Problem solving
T10	•		•		•	•		•	Direct instruction

Instruction, conducted most frequently as a whole group activity, was framed by one overarching strategy as the framework for instruction. Each of the ten teachers incorporated questioning strategies; however, only three (T1, T2, and T8) used questioning in the form of Socratic questioning as the primary emphasis or framework of instruction. Four teachers (T3, T6, T7, and T10) used direct instruction as the major instructional framework, although eight teachers implemented the strategy to various degrees. One of the four teachers (T3), for whom direct instruction was the primary emphasis, implemented two distinctly different 45 minute strategies during the 60 minute block. The first approach was a small group problem solving activity; the second approach was direct instruction with questioning. Two teachers (T5 and T9),

both math teachers, centered their lessons on problem-solving; and one teacher (T4), a science teacher, structured the lesson around an inquiry activity, an outdoor lab experiment.

All ten teachers incorporated questioning strategies; five incorporated group work, and five incorporated independent work within their instructional framework. The primary context for instruction was whole group instruction. The class size for seven of the teachers ranged from 5 to 13 students. T1, T2, and T3 had larger classes of 20 and 22 students; however, they involved each student in the questioning sessions. In the narratives above, evidence of implementation of the other four skills was manifested.

A limited comparison is suggested between the findings of this study of International Baccalaureate Teachers and the findings of the study by Stronge, Tucker, & Ward (2002) of effective and ineffective teachers in the general education setting on the research-based dimension of instructional differentiation. Extreme caution must be observed in interpretation of the data for comparative purposes due to the differences in methodology of the studies. These differences are presented below.

Study Comparisons

Study	Observers	Observations	Sample Selection	Setting	Sample Characteristics
Stronge, Tucker, & Ward (2002)	2 outside observers	each - 3 hours, ½ hour interview	11 - 3 rd grade teachers	regular classrooms	unknown
Hutchinson (2004)	1 participant/observer	each - 60-90 minutes	10 – 11 th & 12 th grade teachers	IB classrooms	specialized training

Considering the caution about too broad an interpretation of the data, findings on the IB study are presented with the findings of the exploratory case analysis.

Table 4.1 Instructional Skills: Findings on Instructional Differentiation

Instructional Differentiation	Multi-site Case Study		Exploratory Case Analysis			
	IB Teachers		Effective Teachers		Ineffective Teachers	
	Mean	SD	Mean	SD	Mean	SD
	3.30	.82	3.20	.45	2.33	1.03

The mean ratings for teacher implementation of instructional differentiation were found to be similar for IB teachers and for effective teachers in the case analysis. The mean ratings differed greatly, however, when compared to mean ratings for ineffective teachers. The mean rating of 3.30 for IB teachers in the skill of instructional differentiation was only slightly higher than the mean rating of 3.20 for the teachers in the case analysis. The ratings for the IB teachers varied somewhat more around the mean than did the ratings for the teachers in the Stronge study.

The ratings for IB teachers were based on student activities, student engagement, and the variety of strategies implemented within the 60-90 minute blocks with adjustment made for the two 60 minute class periods. One class period was normally 60 minutes while another class period was reduced to 60 minutes the day of the observation. The criteria for the ratings were:

- variety of student activities, each of 20 minutes or more, within a class block
- student engagement
- implementation of a variety of strategies

Since the observations revealed that many of the implemented strategies were not discreet strategies but were incorporated within an instructional framework, more strategies were observed than were expected. However, the observations also revealed instruction was primarily teacher- centered whole class instruction. Thus, although teachers employed several strategies, student activity did not markedly vary for 6 of the 10 teachers. Math teachers, T5 and T9,

emphasized independent or small group student problem solving activities. T3 allocated equal time to two activities, a small group activity and to direct instruction with questioning. Science teacher T4 focused the class block on a student-directed ongoing outdoor laboratory experiment.

Instructional Focus on Learning

The Level 4 descriptor and Performance Indicators for I.2 Instructional Focus on

Learning are:

Area I: Instructional Skills

I-2 Instructional Focus on Learning

The teacher allocates maximum time towards instructional activities resulting in minimal interruptions; academic learning time is clearly the focus of instruction.

Sample Performance Indicators:

- a. The teacher maintains a central focus on teaching and learning during classroom time.
- b. The teacher reinforces their focus on instruction by allocating time to teaching and learning and setting high expectations for student learning lesson
- c. The teacher communicates an enthusiasm for and dedication to learning (Stronge & Tucker, 2002).

Focus on Teaching and Learning

The use of class time was a clear indication of the teacher's focus on learning. The teacher who communicated the expectation that every moment was instructional time also expected students to participate in learning during the entire period. Nine of the teachers began conducting the class at the beginning bell either through review of prior learning or homework, preview of the lesson, or instruction. The tenth teacher, TB2, had to send a student to retrieve the texts from another teacher. While the class was waiting for the materials, the teacher gave instructions on an imminent internal assessment, reviewed the last day's reading, and organized a class project to assist a needy family. All ten teachers worked to the final bell. One teacher, T5, borrowed minutes after the bell, listing important concepts which the students recorded in their agendas as they packed to leave for their next class. The greatest difficulty was experienced by T9 who, as

department chair, was called out of the room twice to attend to a problem faced by another teacher. During the longest absence, approximately 10 minutes, T9 returned periodically to check on student progress. Another teacher, T1, had to pause briefly three times to control student discussion. Although students were discussing the topic, they began to be excessively loud and lose focus. However, T6 simply said, "Now listen, please." upon which the students immediately became quiet.

As the performance indicator indicates, the manner in which a teacher managed interruptions indicated the importance of instruction to the teacher. Eight of the ten teachers experienced interruptions during the class observation. Some were the typical interruptions of announcements, students requesting a pass to the restroom, or students arriving late. Other interruptions were a military recruiting officer, a fire drill, and a student requesting to sit in on the class. Only on one occasion did interruptions affect the flow of the class. That incident, referred to above, called the teacher, the department chair, out of the classroom for approximately 10 minutes. None of the other seven teachers allowed the interruptions to alter the flow of instruction.

When a student arrived late, T5 commented, "There she is. I knew she'd be here," then promptly continued with the lesson. During a discussion of quantum physics, an older student walked into T10's classroom and took a seat at the opposite end of the room. Neither the students nor the teacher paused. Later T10 involved the older student in the discussion. In response to another student's question, T10 said, "J---- should know."

Enthusiasm for Learning

Upon returning to class after a 45 minute fire drill, TB3 returned promptly to the lesson.

When it was announced that the class would have the full amount of scheduled time, TB3 expressed great pleasure at having more time to teach.

In three instances, comments were made by the teacher or by the students concerning the teacher's enthusiasm for the course. Earlier in the block, after evaluating stacks of history books owned by the teacher, a student asked if the teacher had read every one of the books. Picking up one book, TB3 indicated that it had not been read. Many of the students gasped until the teacher added, "I listened to this one on tape."

TB1 indicated to the students that the topic was the teacher's college major and exciting to teach. During the observation, T10 indicated the intention to have a license plate that read $e=mc^2$. Later T10 extolled the value of the science course as "fundamental in advancing understanding of everything" and that students were experiencing "systematic indoctrination" to the value of the course.

The findings from the multi-site case study observations and the exploratory case analysis conducted by Stronge, Tucker, and Ward (2002) are depicted below.

Table 4.2 Instructional Skills: Findings on Focus on Learning

	Multi-site Case Study		Exploratory Case Analysis			
	IB Teachers		Effective Teachers		Ineffective Teachers	
	Mean	SD	Mean	SD	Mean	SD
Focus on Learning	3.70	.67	3.40	.55	2.67	1.03

Note: Extreme caution must be observed in interpretation of the data for comparative purposes due to the differences in methodology of the studies. (See page 143.)

The descriptive statistics indicated a moderately greater focus on learning for IB teachers than for effective case analysis teachers. Both the IB teachers and the case analysis effective

teachers were rated notably higher in their focus on learning than were ineffective teachers in the case analysis.

Instructional Clarity

The Level 4 descriptor and the performance indicators for I-3 Instructional Clarity are:

I-3 Instructional Clarity

The teacher communicates effectively with individual students and classroom groups; provides plentiful instructional examples and guided practice.

Sample Performance Indicators:

- a. The teacher uses Standard English grammar when communicating with students.
- b. The teacher uses precise language, acceptable oral expression, and written communication.
- c. The teacher explains concepts and lesson content to students in a logical and sequential manner.
- d. The teacher emphasizes major points of concern by using techniques such as repetition and verbal or non-verbal clues.
- e. The teacher actively listens and responds in a constructive manner.
- f. The teacher provides clear examples and guided practice to enhance clarity lesson (Stronge & Tucker, 2002)

Performance indicators a. and b. were not an issue of concern with any of the ten teachers.

All used Standard English grammar and were adept at oral and written communication. The focus of the observation was to determine logical and sequential instruction with emphasis of key points and adequate examples and guided practice.

Logical and Sequential Instruction

Each of the teachers used an orienting assignment to stimulate thought on the lesson topic. T1 gave a brief journal writing activity to stimulate student thought prior to discussion. The students in T6's class completed a brief written assignment to which they referred during the lecture and questioning activity. Three teachers used outlines - on the blackboard, on overhead transparencies, and in a power point presentation - to enable the students to see logical relationships and topic development. Teachers who focused on the Socratic seminar used a

pattern of higher and lower level questioning to build student conceptual understanding of literary selections.

References to and application of prior learning to current learning was a common instructional tool implemented by the IB teachers. It was a logical result of the integrative nature of the 2-year course structure. Common phrases recorded during the observations were:

- Do you remember last year when we learned....?
- We won't spend a lot of time on this because of last year.
- Have we seen this in earlier [readings]?

Step by step instruction was observed by math teacher T5 who first instructed the students to define the math concept, followed by explanations of the problem solving process they used. All students were instructed, "Show your work." Upon introducing a new concept, T5 explained the calculator process, and then lead them step by step through it.

Emphasis of Major Points

Instructions or questions often served a dual purpose to - clarify major points and as a check for understanding. To emphasize and to signal repetition of important points, teachers gave a variety of verbal clues.

- What you need to know is...
- It is on the IB test.
- Write this down.
- Do you see how that works? It is important that you do.
- The main thing to be aware of is---
- That's not what you have to worry about. These are the major points.
- Here's what I want to know.

- What did we just do?

Constructive Responses

Constructive responses to student uncertainties were provided through additional examples or guided practice. It was also typified by the conversational interchanges between the teacher and the students. Rather than formal discussions, students and teachers talked together about literary selections or course topics in an atmosphere of mutuality ((Heath, 1997). When students were unclear about a science concept, the following approach was demonstration was given by T10:

“It’s like climbing up a ladder. Do you put your feet between the rungs?” What happens? (teacher pretends she is climbing a ladder, gets on top of a desk) Students: Ohhhhhh. Discussion and laughter from all.

When a math teacher and the students were having difficulty matching their math solutions to the solution provided in the text, the teacher worked on the problem with the students, speaking as if they were a team. “That still doesn’t get us to the answer in the book. We worked it out every possible way.”

The findings from the script analyses, indicating high performance on the skill of instructional clarity, are depicted below with the findings for the exploratory case analysis.

Table 4.3 Instructional Skills: Findings on Instructional Clarity

	Multi-site Case Study		Exploratory Case Analysis			
	IB Teachers		Effective Teachers		Ineffective Teachers	
	Mean	SD	Mean	SD	Mean	SD
Instructional Clarity	3.80	.42	3.20	.84	2.83	1.17

Note: Extreme caution must be observed in interpretation of the data for comparative purposes due to the differences in methodology of the studies. (See page 143.)

The mean ratings for International Baccalaureate teachers in the skill of instructional clarity were higher at 3.8 than the mean rating of 3.2 for the Stronge and Tucker study. There was less variation in the ratings for IB teachers than for the effective case analysis teachers. In addition, the ratings for IB teachers was approximately one point higher on a 4 point scale than for ineffective teachers.

Instructional Complexity

The Level 4 descriptor and the performance indicators used as guides were:

I-4 Instructional Complexity

Learning activities require complex thinking as a major focus or extension of the lesson (e.g. students may be asked to analyze cause and effect, identify a problem and reasonable solutions, speculate giving details or justification, defend options or argue a position with evidence to a great extent).

Sample Performance Indicators:

- a. The teacher emphasizes understanding of meaning rather than merely memorizing facts.
- b. The teacher emphasizes the students' knowledge of the world to develop understanding.
- c. The teacher develops students' cognitive abilities by encouraging application, comprehension, analysis, synthesis, and evaluation of new knowledge.
- d. The teacher fosters discovery of new understandings of concepts through stimulating activities.
- e. The teacher uses questioning strategies to engage students and promote learning (Stronge & Tucker, 2002).

Discussion of the varied activities and questioning strategies has been extensively developed earlier in this section. In addition, as presented in Research Question 1, complexity is imbedded in the nature of the courses and mandated by the international standards established for every course. Teachers use multiple resources, many of which are college level and/or international texts or literary selections. Therefore, the emphasis will be twofold:

- a. to explore incorporation of real world examples that enable students to make their learning relevant.
- b. to explore the strategies that promoted high level cognitive processing

Real World Examples

T10: The teacher periodically punctuated the lesson with real world examples and personal experiences to illustrate concepts. In a questioning session on radiation, T10 discussed a personal experience with wisdom teeth removal. Later to answer a student question the teacher referred to “little bouncy balls kids love.” To another student question T10 used a real world situation to make a connection to the concept.

How to explain? Anyone here like football? Let’s say I am going to a football game with --- (names a student), not at the same time, and you have to find me. You can’t use a speaker or a cell phone. What is the probability you will find me?

After students responded, T10 continued with the connection to the lesson.

Let’s try to find something the size of an electron. Therefore, it was pretty amazing that science could find out what they did without computers.

T6: As an example of international organizations, T6 used the International Baccalaureate Organization as the primary example.

What makes it an international organization? Does it have interests that cross international boundaries?...Is IB coming up with the solution to pollution?...Why isn’t their headquarters in Africa?

Several teachers used school sports or movies to events and themes further conceptual understanding.

- T7: It’s like in *Minority Report* – crimes in the future.
- T8: (To a track runner). Can you guesstimate a mile when running? Can you guess the distance you ran? To Denbigh Boulevard, how many light poles have you passed?

High Cognitive Processing

The assessment of the level of complexity of learning required through the teacher’s instruction focused on the extent to which the teacher required the students to go beyond rote learning. The assignments demanded higher level thinking by requiring students to support an

idea with evidence, determine cause and effect, or identify solutions. The examples of this skill were described in the area of Instructional Skills, and also are exemplified in these quotes recorded during the observations.

- T1: Where did you hear this? So you can back this up?
- T2: “Is there another way to make a connection? Is there anything (in the poem) to counteract the mourning? Is that idea original to him (the poet)? Do the poetic devices make the poem original? How?”
- T3: Is that life? Give me evidence! What is the impact? Predict! What will happen?
- T4: Is that a biotic occurrence? Should you consider that?
- T6: If --- an event happens, then how can we penalize ---- (another behavior)?
- T8: Come up with five reasons why this would qualify as great literature.
- T10: Identify similarities and differences between Bohr’s Model and the quantum mechanical model. “What happens if...?” (frequent teacher and student question)

The data for teacher performance in the instructional skill area of Instructional Complexity for IB teachers and for effective and ineffective teachers in the exploratory case analysis are depicted below. The findings for the populations are quite different; however, the data on the Stronge study are provided only as an exploratory case analysis.

Table 4.4 Instructional Skills: Findings on Instructional Complexity

Instructional Complexity	Multi-site Case Study		Exploratory Case Analysis			
	IB Teachers		Effective Teachers		Ineffective Teachers	
	Mean	SD	Mean	SD	Mean	SD
	3.80	.42	3.00	.71	1.83	.98

Note: Extreme caution must be observed in interpretation of the data for comparative purposes due to the differences in methodology of the studies. (See page 143)

The mean rating for IB teachers in the skill area of instructional complexity was notably higher at 3.80 than the mean ratings of 3.0 for effective teachers in the case analysis and markedly higher than the mean of 1.83 for ineffective teachers. IB teachers were rated at a score closer to 4 on a 4 point scale. The scores varied less for the 10 IB teachers than for the 85 case study teachers; however, the difference in sample size has a large impact on this finding.

Expectations for Student Learning

The Instructional Skill area of expectations overlaps the other skill areas, most notably the skill area of complexity. The Level 4 descriptor and the performance indicators used as guides were:

I-5 Expectations for Student Learning

The teacher consistently encourages maximum effort from students and provides the encouragement to promote it; stresses student responsibility.

Sample Performance Indicators:

- a. The teacher sets high expectations for students and herself/himself.
- b. The teacher has consistently high expectations for all students.
- c. The teacher stresses student responsibility and accountability for meeting expectations.
- d. The teacher teaches students metacognitive strategies to support reflection on learning progress.
- e. The teacher solicits comments, questions, examples, demonstrations, or other contributions from students throughout the lesson (engagement) (Stronge & Tucker, 2002)

Questioning was addressed in the discussion of other skill areas; therefore, the discussion in the area of expectations will emphasize high expectations for student responsibility and teacher encouragement to promote it. Teacher activities or behaviors that promote metacognition will also be examined.

Student Responsibility and Teacher Encouragement

Student responsibility. T4: The students in T4's science class had the responsibility for preparing and conducting lab experiments and for recording and managing data for labs. As a

result of a fire drill that shortened class time, a lab had to be rescheduled for the following class period. Due to personal circumstances the teacher was not scheduled to be in school the day prior to the lab; therefore, students volunteered to stay after school in the teacher's absence to set up the lab themselves.

T5 and T9: Both math teachers required students to show every step in the problem solving process for each problem.

Each of the 10 teachers repeatedly emphasized the students' responsibility to learn content and process for exams and internal assessments. Internal assessments, as described by teachers and IB Organization materials, are student-directed. The requirements specify student responsibility with a minimum of teacher intervention and guidance (IBO, 2002c).

Teacher Encouragement. Encouragement to promote maximum effort was infrequently characterized by verbal praise. T2 used the strategy more prolifically than was observed by other teachers, although the script only records eight words or phrases of verbal praise during the 60 minute period. Typical phrases were: "How wonderful to make connections that way! Is there another way to make a connection?... A little challenging but you can do it!... Good! Good point!"

T3 used verbal encouragement during the students' reporting of findings from small group investigation. T3 remarked, "Good... okay... great!" In response to student answers during direct instruction, teacher responses were toned down. The response of "Exactly!" was followed by further questions.

The behavior of T9 was similar. "You're on the right track" or "Doing well."

Minimal praise was also given by:

T5: Right. Good!

T6: Okay, yes.

More typical of strategies to promote maximum effort was the acknowledgement of student responses followed by further teacher questions. This appeared to engender high level thinking and fast paced discussions. The acknowledgement took the form of:

- T1, T2, and T6: reflection of the student answer
- T4: responses to student questions with questions.
- T7: Do you see how that works? Alright, I hope you understand that.
- T10: Right, okay

Metacognitive Strategies

Strategies that promoted reflection on the learning process were practiced during eight of the observations. The following strategies or instructions took the form of encouraging or instructing students to analyze why they answered as they did.

T1: The objective of the entire Theory of Knowledge course and this particular lesson was for students to analyze their thinking and sensory perceptions.

T1 and T8: "Give me evidence."

T2: Students were instructed to think about the thought processes they used in their homework explications and to write notes commenting on their thought processes. Students were advised to reflect on their own thinking to prepare for internal assessments.

T4: The teacher's instructed students, during and after labs, to think about what they were doing and what they did.

T5 and T9: Students were required to explain their thinking processes and the steps they followed to find solutions.

T10: Directions for a test review assignment were, “Analyze why you answered as you did. Think it through.”

Observations indicated that teachers had high expectations for high levels of student performance; therefore, the ratings for this skill area are high. Table 4.5 depicts the ratings for skill area Expectations for Student Learning.

Table 4.5 Instructional Skills: Findings on Expectations for Student Learning

Expectations for Student Learning	Multi-site Case Study		Exploratory Case Analysis			
	IB Teachers		Effective Teachers		Ineffective Teachers	
	Mean	SD	Mean	SD	Mean	SD
	3.70	.48	3.00	.71	3.17	.98

Note: Extreme caution must be observed in interpretation of the data for comparative purposes due to the differences in methodology of the studies. (See page 143)

The mean rating of 3.7 for IB teachers in their expectations for learning is notably larger than the rating of 3.0 for effective teachers and 3.17 for ineffective case analysis teachers, indicating findings in favor of the IB teachers. Expectations for student learning were clearly greater for IB teachers than for the teachers in the third grade classrooms. However, the difference in populations allows for only a limited comparison of the behaviors of the teachers.

Summary of Research Question 2

The examination of the observation scripts provided a profile of the IB teacher as one who implemented a limited number of student activities and a variety of strategies within an overarching instructional framework. The rapid pace of instruction and the high levels of questioning, conceptual understanding, and assignments indicated consistently high levels for student achievement and complexity of understanding. Table 4.6 presents the profile of the IB teachers and the profiles of effective and ineffective teachers in the exploratory case analysis.

Table 4.6
Comparison of Descriptive Analysis of Instructional Skills

Description	Multi-site Case Study of IB Teachers		Exploratory Case Analysis			
	Mean	SD	Effective Teachers		Ineffective Teachers	
			Mean	SD	Mean	SD
I-1 Instructional Differentiation	3.30	.82	3.20	.45	2.33	1.03
I-2 Focus on Learning	3.70	.67	3.40	.55	2.67	1.03
I-3 Instructional Clarity	3.80	.42	3.20	.84	2.83	1.17
I-4 Instructional Complexity	3.80	.42	3.00	.71	1.83	.98
I-5 Expectations for Student Learning	3.70	.48	3.00	.71	3.17	.98

Note: Extreme caution must be observed in interpretation of the data for comparative purposes due to the differences in methodology of the studies. (See page 143)

With the exception of skill area of instructional differentiation, International Baccalaureate teachers received notably higher mean ratings than did the case study teachers in the Stronge, Tucker, and Ward study (2002). The mean ratings for the skill area of instructional differentiation were similar to the ratings for effective teachers but notably higher than the ratings for ineffective teachers. Focus on learning, instructional clarity, instructional complexity, and expectations for learning showed higher mean ratings for IB teachers than for case analysis teachers. The greatest difference was seen in ratings for Instructional Complexity with the IB teachers scoring closer to 4 with a mean rating of 3.80 and the case analysis population scoring 3.0. An emphasis on instructional complexity is clearly evident through the analysis of

International Baccalaureate curricular and program goals and their alignment with recommended practices for gifted education clearly.

Research Question 3 Results

Research Question 3: As determined by observation to what degree do teachers of International Baccalaureate students use a variety of assessment practices to monitor student progress?

As found in Research Question 1, assessment is a significant component of the IB program design. In addition to end of course exams, termed by IB as external assessments, the IB requires process oriented internal assessments (IBO, 2002a; VanTassel-Baska & Little, 2003). Considering the emphasis IB places on examinations, the researcher examined the impact and approach to assessments made by the IB teachers during the observations. Two assessment areas were examined using the Teacher Effectiveness Behavior Scale: Assessment Skills which can be found in the Appendix.

- Assessment for Understanding
- Quality of Verbal Feedback to Students

Assessment for Understanding

The Level 4 descriptor for Assessment for Understanding is:

A-1 Assessment for Understanding

The teacher regularly checks in with students to monitor their level of understanding, interest, frustration, etc. Student understanding is assessed through a variety of methods (observation, group questioning, individual conversations, looking at student work, etc.). The teacher remains flexible in instructional decision-making and seems to continuously use “data” to adjust instruction (Stronge & Tucker, 2002).

The approach to this assessment area was twofold:

- Check for understanding
- Data to adjust instruction

Check for understanding. Each of the teachers frequently checked for student

understanding (CFU), using questioning or focused statements as the major vehicles. The settings were whole group, small group, and individuals. TB4 observed and discussed the math problems with each student as they worked through the process. T7 monitored the responses of each student in a large group Socratic seminar setting. Those who did not respond during the seminar were called on to give specific information. During T3's book evaluation assignment, the teacher circulated to each group asking probing questions about their findings. When they reported their findings, he continued with probing questions to promote objective analysis.

Typical of CFU phrases were the following:

- T1, T2, T3, T5, and T6: What do you think?
- T3: What did we just do?
- T5: Right? Did you all do that correctly? Everyone agree with that? (The question is followed by reporting out by each student.)
- T7: Do you see how that works? It is important that you do. I hope you understand that. (posed as a question)
- T8: You think so? Do you understand that?
- T9: Do you agree? Tell me what you're thinking. How are you doing? Do you see the pattern?

Data to Adjust Instruction

Two quizzes were administered during the observations. At the conclusion of the math quiz, T5 and students discussed the answers upon which students and the teacher did not agree. However T5 agreed to give the problem a second look and to adjust the answer if necessary. T9 worked on math problems with the students, not progressing to another problem until they had reached consensus on the answer. T10 adjusted grading on a test to consider the problematic

questions. The closing activity was a test review, coupled with an assignment to write corrections for specific questions. The instructions were, “Analyze why you answered as you did. Think through your thought processes.”

In addition to using test data to adjust instruction, teachers used verbal data. The accuracy of student responses during question and answer sessions determined the flow of the discussion. This type of feedback is examined in the next assessment area of Verbal Feedback. The focus on adjustment to data will be on the impact of IB internal and external assessments on the class. Of the 10 teachers observed, two did not make references to IB assessments. One was T1 who taught Theory of Knowledge, a course whose focus is on thought processes and which does not administer an external assessment. The second was the shortened biology class.

T3 designed a 45 minute activity to replicate the internal assessment and the type of question that would appear on their external assessment. T7 opened class with a discussion of the evaluation procedures of the internal assessment. T10, T9, and T6 discussed tests they had administered which included IB questions from prior examinations. Periodically during the class period, T5 related the lesson content to questions on IB examinations. The observations were snapshots taken on one day out of 180; yet, eight of 10 teachers discussed and appeared to design instruction to fit the IB assessments. Assessments appeared to be either the driving force or the underlying agenda behind the lessons of eight of the IB teachers.

The findings for Assessment for Understanding are depicted in Table 4.7.

	Mean	SD
Assessment for Understanding	3.70	.48

The findings reflect high performance on Skill Area A-1 Assessment for Understanding.

The mean rating for the IB teachers was 3.7 with little variation in their ratings.

Quality of Verbal Feedback

The Level 4 descriptor for this assessment area is:

A-2 Quality of Verbal Feedback to Students

The teacher provides *verbal* feedback consistently, addresses individual student strengths and weaknesses, and encourages student self-reflection. Feedback is fair and demonstrates high expectations for all students (Stronge & Tucker, 2002).

The quality of verbal feedback will be addressed briefly as the data overlaps the data on the teachers' approaches to checking for understanding. Teacher practices exhibiting high expectations and the means by which they promote reflection was addressed in Research Question 2. After a brief discussion of the approach to verbal feedback, the focus of the data on this assessment area will be to explore teachers' knowledge of student strengths and weaknesses.

Quality of Feedback

The CFU described above was concomitant with probing questions directed by teachers at individual students while others asked questions of the whole class rather than individuals. Students' answers to questions affected the direction of the questioning.

Concerned over students' inabilities to grasp a major concept, T7 said, "You are missing the most important thing." Rather than explaining the concept, the teacher framed questions to lead students to discover "the most important thing." T4 used a similar technique, asking individual students as they performed a lab experiment, "What are you doing? What are you supposed to be doing?" Teachers' questions were challenging and probing questions that forced students to examine what they knew and needed to know.

Student Strengths and Weaknesses

The small classes of 5 to 22 students and the integration of courses over a two year period appeared to allow more teacher to student interaction and the teachers' knowledge of individual student strengths and weaknesses. Although many of the teachers did not teach both years, they were required to assess two years of learning in order to know what concepts needed to be reinforced. The following vignette from T10 exemplifies this understanding of student strengths and weaknesses.

We won't spend a lot of time on this, ok, because of last year. (discusses their problem last year – their weak spot). Students and teacher discuss their weaknesses and what they didn't understand. Hopefully it will this time. This is what you need to accomplish this time.

T5 addressed each student by name, asking what their answers were and to describe the process used to arrive at the answer. T5 walked to individual students giving individual instruction to those who could not program their calculators or who could not solve a problem. T9 followed the same procedure ending the class period with a discussion of a prior concept at the request of a student who was finding it difficult to comprehend.

Although verbal feedback and checks for understanding were provided on a consistent basis, individual checks on individual understanding was observed by five teachers. Two of the five teachers asked questions of individual students during questioning sessions and assessed their understanding of the concept through a culminating assignment after which each student reported out.

At the conclusion of a Socratic seminar, T3 assigned an individual activity in which the students were to evaluate the selection discussed. Each student reported out their findings at the conclusion of the assignment.

The other five teachers engaged each student in questioning during the lesson and framed subsequent questions according to student responses. Since the classes were small individual strengths and weaknesses could be discerned, although they were not individually addressed.

The findings for Area A-2 are depicted below.

Table 4.8 Assessment Skills: Findings for Quality of Verbal Feedback

	Mean	SD
Quality of Verbal Feedback to Students	3.60	.53

Verbal feedback and checks for understanding were provided on a consistent basis. The mean rating of 3.6 and the small variation around the mean indicated high levels of verbal feedback although, in most cases, that feedback did not take the form of verbal praise.

The feedback provided clear information on what students needed to do or know to enhance their conceptual understanding. However, checks on individual understanding by 50% of the teachers were conducted in whole class settings during questioning rather than being directed to individual student strengths and weaknesses. A concluding reporting out activity similar to that conducted by T8 would have addressed that situation.

Summary of Research Question 3

As the findings indicated, teachers frequently checked for student understanding of concepts and discussed IB assessments in all but two classes. Checks for understanding and verbal feedback occurred principally in question and answer sessions. Although questions to monitor understanding were addressed to the whole group, each student responded during the sessions. However, 50% of the teachers did not address individual student strengths and weaknesses. Teachers, however, were fair in their feedback to students which demonstrated expectations of high student achievement.

Table 4.9 depicts the findings on the effective assessment practices of IB teachers.

Description	Mean	SD
Assessment for Understanding	3.70	.48
Quality of Verbal Feedback to Students	3.60	.53

Research Question 4 Results

Research Question 4: At what levels do teachers of International Baccalaureate students self-report their Teacher-Efficacy beliefs in comparison with a sample of a cross-section of high school teachers?

Data to determine teacher-efficacy beliefs was collected from 33 trained International Baccalaureate teachers in their responses to the 24-question Teachers' Sense of Efficacy Scale (TSES). Thirty-four questionnaires were mailed to teachers in two distributions. Anonymity was assured; however, one teacher elected not to return a questionnaire.

Tschannen-Moran, Hoy, and Hoy (2001) conducted three studies to insure construct validity for the TSES instrument. The items on the scale were originally selected from Bandura's scale and subject to factor analysis and refinement in the three studies resulting in a 24-item long form and a 12-item short form. The construct reliability was .94 for the 24-item scale and .90 for the 12-item scale. The Long Form was used in this study.

Consideration was taken by Tschannen-Moran, Hoy and Hoy to include items that assessed teachers' judgment of their abilities to respond to the "instructional needs of capable learners" (p.799) which proved valuable to this study. The authors found that responses to the

TSES loaded on three factors: efficacy for student engagement, efficacy for instructional practices, and efficacy for classroom management. The items are equally weighted.

Teachers responded to each item using a Likert scale with eight possible choices ranging from nothing to a great deal. The total possible responses were: nothing, very little, some influence, quite a bit, a great deal. The three TSES subscale groupings were:

Teachers' Sense of Efficacy Scale Subscale Groupings

Efficacy Subscale	Questionnaire Items
Efficacy in Student Engagement	Questionnaire items 1, 2, 4, 6, 9, 12, 14, 22
Efficacy in Instructional Strategies	Questionnaire items 7, 10, 11, 17, 18, 20, 23, 24
Efficacy in Classroom Management	Questionnaire items 3, 5, 8, 13, 15, 16, 19, 21

The level of response to each question was recorded and tallied to determine the total number of responses for each question at each level with the goal of developing a profile of teacher-efficacy beliefs for this population of IB teachers. Of the 33 respondents four participants omitted responses to a total of 5 items:

- 1 questionnaire - two omissions, items #10 and #14
- 3 questionnaires - one omission each, items #7, #10, #11

For the four incomplete questionnaires, the mean answer for each respondent was computed and used as the response for the omitted item(s). It was not possible to determine whether these omissions were intentional or inadvertent.

Means, percentages, response numbers, and standard deviations were computed to ascertain the extent to which teachers believed they could influence students' lives. Although no comment section was included, comments were written on two of the forms. This added information will be discussed in the relevant sections. Teacher responses on the total 24 item scale are presented in Table 4.10. They will be discussed followed by analyses of the individual subscales.

Table 4.10
Teachers' Sense of Efficacy Scale (long form)

Teacher Beliefs		Levels								
		Nothing (1)	(2)	Very Little (3)	(4)	Some Influence (5)	(6)	Quite a Bit (7)	(8)	A Great Deal (9)
Directions: The questionnaire is designed to help us gain a better understanding of the things that create difficulties for teacher in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.										
1	How much can you do to get through to the most difficult students?	0	0	2	3	12	5	4	1	6
2	How much can you do to help your students think critically?	0	0	0	0	0	8	13	3	9
3	How much can you do to control disruptive behavior in the classroom?	0	0	0	0	1	3	12	3	14
4	How much can you do to motivate students who show low interest in school work?	0	0	2	2	10	9	4	3	3
5	To what extent can you make your expectations clear about student behavior?	0	0	0	0	0	2	3	7	21
6	How much can you do to get students to believe they can do well in school work?	0	0	0	1	5	4	8	8	7
7	How well can you respond to difficult questions from your students?	0	0	0	0	1	2	8	8	14
8	How well can you establish routines to keep activities running smoothly?	0	0	0	0	0	0	6	9	18
9	How much can you do to help your students value learning?	0	0	0	1	3	6	11	6	6
10	How much can you gauge student comprehension of what you have taught?	0	0	0	0	1	1	8	12	11
11	To what extent can you craft good questions for your students?	0	0	0	0	0	1	9	12	11
12	How much can you do to foster student creativity?	0	0	0	1	8	4	5	5	10
13	How much can you do to get children to follow classroom rules?	0	0	0	0	1	1	15	4	12
14	How much can you do to improve the understanding of a student who is failing?	0	0	1	2	8	6	8	5	3
15	How much can you do to calm a student who is disruptive or noisy?	0	0	0	0	8	5	7	7	6
16	How well can you establish a classroom management system with each group of students?	0	0	0	0	2	2	8	11	10
17	How much can you do to adjust your lessons to the proper level for individual students?	0	0	0	0	0	3	11	8	11
18	How much can you use a variety of assessment strategies?	0	0	0	0	1	5	6	7	14
19	How well can you keep a few problem students from ruining an entire lesson?	0	0	0	2	3	3	10	4	11
20	To what extent can you provide an alternative explanation or example when students are confused?	0	0	0	0	1	1	5	9	17
21	How well can you respond to defiant students?	0	0	0	0	5	2	11	5	10
22	How much can you assist families in helping their children do well in school?	0	0	1	3	8	5	6	7	3
23	How well can you implement alternative strategies in your classroom?	0	0	0	1	2	5	10	4	11
24	How well can you provide appropriate challenges for very capable students?	0	0	0	0	1	1	7	13	11

Developers: Megan Tschannen-Moran, College of William and Mary
 Anita Woolfolk Hoy, the Ohio State University, 2001.

A limited comparison will be made with a study conducted by Tschannen-Moran and Hoy (2002) of teacher-efficacy beliefs held by of 255 teachers. The 24-item Teachers' Sense of Efficacy Scale was administered to a population of teachers who may have included teachers of gifted and International Baccalaureate students. Due to the vast difference in sample size for the two studies a very limited comparison of means and standard deviations for the IB and the Tschannen-Moran studies will be made for informational purpose only. The differences in the two studies are presented below:

Study Comparisons

Study	Sample Size	Setting	Sample Characteristics	Grade Levels
Tschannen-Moran & Hoy (2002)	255 teachers	urban, suburban, & rural school districts	general education teachers (may include gifted & IB teachers)	K-12
Hutchinson (2004)	33 teachers	1 urban & 1 county school district	teachers of IB & regular education students	11 th & 12 th

24 Item TSES Findings

The data from the Teachers' Sense of Efficacy Scale is examined from two perspectives. Means and standard deviations are computed for the continuous variables (9 response levels) on the 24 item scale and on each of the three subscales. The continuous variables are first treated as categorical variables by collapsing the nine response levels into three response levels to indicate the number and percentage of responses at each of the three collapsed levels.

Categorical Analysis

After tallying the total number of responses at each of the nine levels for each of the 24 items, the nine levels were collapsed into three categories to develop a profile of the efficacy beliefs of the 33 IB teachers. These three levels were:

- lowest category - nothing to very little

- mid category - some influence
- upper category - quite a bit to a great deal

Higher level responses. Thirty three teachers responded to 24 items on the TSES for a total number of responses of 792. According to Table 4.10, 249 or 31.4% of the responses to the 24 items on the TSES were recorded at level 9, or “a great deal,” the level of greatest teacher efficacy belief. None of the responses was made at the lowest level, level 1 or “nothing,” of teacher efficacy belief. Item #5 was the question with the greatest number of responses at level 9. Twenty-one of the 33 IB teachers, or 63.6% had high teacher efficacy belief in their ability to make their behavioral expectations clear to students. This was followed by 18 level 9 responses to item #8, which stated teachers’ beliefs in their ability to “establish routines to keep activities running smoothly.” Both items loaded on the Subscale for Efficacy in Classroom Management. Item #20, which concerned the belief in the ability to provide alternative explanations to clear up student confusion, received 17 responses at level 9. Item #20 loaded on the subscale for Efficacy in Instructional Strategies.

As described above, the nine levels were combined into three categories to develop a profile of teacher efficacy beliefs for the 33 respondents. Of the total number of responses, 178 or 22.62% were recorded at the mid category, indicating teachers believed they had “some influence” over students. The greatest number of responses was recorded at the upper category or highest levels of the scale. Of a total of 792 responses 605 or 75.76% of the total responses indicated that teachers believed they had “quite a bit to a great deal” of influence over students.

Lower level responses. As Table 4.10 indicates no teachers responded at the two lowest categories of the TSES and only six or .8% of the responses were made at the upper category of teacher efficacy belief. Although the numbers were small, the questions to which teachers

answered at level 3 or “very little” were #1, #4, #14, and #22. The four items loaded on the subscale of Efficacy in Student Engagement and will be discussed in that section.

The numbers and percentages of responses at each of the three collapsed levels are presented below:

Table 4.11 Categorical Analysis of 24 Item Teachers’ Sense of Efficacy Scale

Responses	nothing - very little #1,2,3	some influence #4,5,6	quite a bit- a great deal #7,8,9	total (# of responses)
# of Responses	6	181	605	792
% of Responses	.08%	22.65%	75.76%	

Descriptive Statistical Analysis

The data were also analyzed using descriptive statistics to indicate the mean ratings of the participants and the standard deviation for the total 24 item scale. The means and standard deviations for the International Baccalaureate teachers are presented below along with the data from the study by Tschannen-Moran and Hoy (2002).

Table 4.12 Descriptive Statistical Analysis of 24 Item Teachers’ Sense of Efficacy Scale

IB Research (n=33)		Comparative Case Analysis (n=255)	
Means	Stan. Dev.	Means	Stan. Dev.
7.43	1.45	7.17	.84

Note: Caution must be taken in interpreting the findings from a comparison of the two studies.

(See page 168.)

The mean score of 7.43 on a scale of 1-9, indicated that the 33 IB teachers were more likely to report their teacher efficacy beliefs to be at a level between level 7 and level 9 of the nine point scale. Generally the participants believed they had between “quite a bit” and “a great

deal” of influence over student achievement and behavior. These findings are depicted in the categorical analysis reported above which found that 75.76% of the total number of responses were recorded at the third categorical level of #7, 8, and 9 or “quite a bit” to “a great deal.” The standard deviation of 1.45 indicates that teacher responses did not vary a great deal around the mean.

The mean score of 7.43 for the 33 IB teachers was slightly higher than the mean score of 7.17 on the 24 item TSES for the 255 teachers in the comparative study, some of whom may have been teachers of IB and gifted students. Both study populations reported teachers’ sense of efficacy at the upper third of the scale; however, IB teachers tended to rate themselves somewhat closer to level 8 than did the case analysis population. Although neither study showed a great deal of variation around the mean, the IB study showed a somewhat greater variation. Individual items and ratings will be presented in the discussion of the subscales.

TSES: Subscale for Efficacy in Student Engagement

As depicted in Table 4.13 eight items load on the subscale for student engagement. Teachers reported fewer high level responses on this scale than on the other two subscales. However, teachers were more likely to say they had “quite a bit” (level #7) of influence to “a great deal” (level #9) of influence than they were to say they had “nothing” or “little influence” over student engagement. The teachers indicated lower levels of teacher efficacy beliefs on items pertaining to behavioral and academic problems such as on item #1, “How much can you do to get through to the most difficult students.” Twenty teachers rated their beliefs in their ability to influence difficult students at levels 4, 5, or 6 on the 9 point scale.

Table 4.13
Teachers' Sense of Efficacy Scale: Subscale for Sense of Efficacy in Student Engagement

Teacher Beliefs		Nothing			Very Little			Some Influence			Quite a Bit		A Great Deal	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)				
Directions: The questionnaire is designed to help us gain a better understanding of the things that create difficulties for teacher in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.														
Levels		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)				
1	How much can you do to get through to the most difficult students?	0	0	2	3	12	5	4	1	6				
2	How much can you do to help your students think critically?	0	0	0	0	0	8	13	3	9				
4	How much can you do to motivate students who show low interest in school work?	0	0	2	2	10	9	4	3	3				
6	How much can you do to get students to believe they can do well in school work?	0	0	0	1	5	4	8	8	7				
9	How much can you do to help your students value learning?	0	0	0	1	3	6	11	6	6				
12	How much can you do to foster student creativity?	0	0	0	1	8	4	5	5	10				
14	How much can you do to improve the understanding of a student who is failing?	0	0	1	2	8	6	8	5	3				
22	How much can you assist families in helping their children do well in school?	0	0	1	3	8	5	6	7	3				

Developers: Megan Tschannen-Moran, College of William and Mary, Anita Woolfolk Hoy, Ohio State University, 2001.

Categorical Analysis

Higher level responses. The greatest number of responses at the upper third category (levels 7, 8, and 9) was tallied for #2 which had 25 ratings at the highest levels. Twenty-five teachers believed they had “quite a bit” to “a great deal” of ability to help their students think critically. Teachers showed greater levels of teachers’ sense of efficacy on the items critical to high level learning. Their responses were the highest on the items that indicated the belief that they had “quite a bit to a great deal” of capability to influence students in four areas:

Highest Item Response Rates for Student Engagement

Item	# Responses – Upper 1/3
#2 critical thinking	25
#6 student belief in their ability	23
#9 value for learning	23
#12 creativity	20

The numbers and percentages of teacher responses at each category are illustrated in Table 4.14.

Table 4.14 Categorical Analysis of Sense of Efficacy in Student Engagement

Responses	nothing - very little #1,2,3	some influence #4,5,6	quite a bit- a great deal #7,8,9	total (# of responses)
# of Responses	6	114	144	264
% of Responses	2.30%	43.18%	54.55%	

Table 4.14 indicates that of the 264 responses, 54.55% or 144 responses were at the upper third category, notably lower than the upper third category responses of 89.77% for sense of efficacy in instructional strategies and 84.85% at the upper levels for sense of efficacy in classroom management. It must be noted that the number of responses does not indicate a number of teachers. The categorical tables, as in Table 4.14, can be more clearly understood when examined with the subscale tables reporting the actual item responses as in Table 4.13. For example, the six responses at the lower third category of “nothing” to “very little” (levels 1, 2, and 3) as depicted in Table 4.14 may be two teachers or 6 teachers as shown in Table 4.13.

Lower level responses. Although 54.55% or 144 of the total number of possible responses were at the upper third category on Table 4.14, the numbers of responses indicating “quite a bit” to “a great deal” of teacher efficacy beliefs in their ability to influence student engagement was lower than with the other two subscales. For example in examining item #1 in Table 4.13, 11 of the 33 teachers believed they had “quite a bit” to “a great deal” of influence over difficult students (the upper third category of responses) while 20 of the 33 teachers rated themselves in the middle category of levels 4, 5, and 6 on item #1. They believed they had between “very little” and “quite a bit” of influence over difficult students. Twelve of these teachers rated themselves as having only “some influence” over these students.

On item #4, ten of the 33 teachers believed they had only “some influence” over students with low interest in school work, and a total of 21 teachers rated themselves at the middle third category (levels 4, 5, and 6) in their ability to motivate low interest students. According to Table 4.14, over 43% of responses were reported at levels 4, 5, and 6 for sense of efficacy in student engagement. Six “very little” responses were recorded: 2 each for questions 2 and 4 and 1 each for questions 14 and 22. Of the ten possible teacher responses, approximately 2.3% indicated they had the lowest levels of belief in their ability to influence students who were difficult, were unmotivated, or were failing. One teacher had low levels of belief in the ability to assist families. The least number of scores at the upper third was #4 which had only 10 responses at the highest levels. Approximately 30% expressed ‘nothing to very little’ as their level of confidence in their abilities to motivate students with low interest in school work.

The percentage of responses in the mid and upper third categories of the student engagement subscale showed less difference than on the other two subscales. Of the 262 responses 43% answered “some influence” and 54.6% indicated “quite a bit” to “a great deal” of efficacy in student engagement. They were much more likely to believe in their ability to exert some influence than to believe they had little control over student engagement.

Descriptive Statistical Analysis

The means and standard deviations are depicted below along with the data for the Tschannen-Moran (2002) study.

IB Research (n=33)		Comparative Case Analysis (n=255)	
Means	Stan. Dev.	Means	Stan. Dev.
6.67	1.60	6.66	1.02

Note: Caution must be taken in interpreting the findings from a comparison of the two studies. (See page 168.)

The mean scores of both studies were notably similar. Both suggest that teachers were likely to say they had between “some influence” and “quite a bit” of influence over student engagement. The mean rating of 6.67 for IB teachers and 6.66 for the comparative analysis teachers translates into a mean rating between 6 and 7 on the 9 point scale. The findings are depicted similarly in the categorical analysis in Table 4.14.

Although the standard deviation indicated a higher variance for the 33 IB teachers (1.60) than for the 255 teachers in the Tschannen-Moran study (1.02), it suggests that scores did not vary greatly.

TSES: Subscale for Efficacy in Instructional Strategies

Of the three subscales, this subscale was more pertinent to high level teaching and learning. It included the most number of items that were comparable to the instructional skills and assessment practices measured on the Teacher Effectiveness Behavior Scale used to analyze teacher practices in research questions 2 and 3. The teachers indicated high levels of teacher efficacy beliefs in instructional strategies. Eight items loaded on this subscale.

Table 4.16
Teachers' Sense of Efficacy Scale: Subscale for Sense of Efficacy in Instructional Strategies

Teacher Beliefs		Nothing			Very Little			Some Influence			Quite a Bit		A Great Deal
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			
Directions: The questionnaire is designed to help us gain a better understanding of the things that create difficulties for teacher in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.													
Levels		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			
7	How well can you respond to difficult questions from your students?	0	0	0	0	1	2	8	8	14			
10	How much can you gauge student comprehension of what you have taught?	0	0	0	0	1	1	8	12	11			
11	To what extent can you craft good questions for your students?	0	0	0	0	0	1	9	12	11			
17	How much can you do to adjust your lessons to the proper level for individual students?	0	0	0	0	0	3	11	8	11			
18	How much can you use a variety of assessment strategies?	0	0	0	0	1	5	6	7	14			
20	To what extent can you provide an alternative explanation or example when students are confused?	0	0	0	0	1	1	5	9	17			
23	How well can you implement alternative strategies in your classroom?	0	0	0	1	2	5	10	4	11			
24	How well can you provide appropriate challenges for very capable students?	0	0	0	0	1	1	7	13	11			

Developers: Megan Tschannen-Moran, College of William and Mary, Anita Woolfolk Hoy, Ohio State University, 2001.

Categorical Analysis

Table 4.17 illustrates a categorical analysis of teacher responses by levels.

Table 4.17
Categorical Analysis of Sense of Efficacy in Instructional Strategies

Responses	nothing - very little #1,2,3	some influence #4,5,6	quite a bit - a great deal #7,8,9	total (# of responses)
# of Responses	0	27	237	264
% of Responses	0%	10.23%	89.77%	

Higher level responses. Scores at the upper third of the 9 levels were greater on the subscale for Efficacy in Instructional Strategies than for the subscale on Efficacy in Student Engagement, indicating high levels of teachers sense of efficacy on this factor. No scores were tallied at the lower third; 27 were tallied at the mid third, and 237 were recorded at the upper

third. Of 264 responses, 10.23% of the responses indicated “some influence,” and 89.77% indicated “quite a bit” to “a great deal” of belief in their ability to influence student achievement through instructional strategies. The item with the least number of responses at the upper third was #23 with 25 responses at those levels. Although it was the lowest on this subscale, the number of responses was comparable to the 25 upper third responses marked on item #2, the highest ranked item in the Student Engagement subscale. This item addressed teacher’s beliefs in their ability to enable students to think critically, also a factor vital to high level teaching and learning.

Thirty-two of the 33 respondents indicated high confidence in their ability to craft good questions, a key strategy practiced by each of the ten teachers observed for research questions 2 and 3. Thirty-one of 33 teachers indicated high levels of teacher efficacy for their ability to gauge student comprehension, their ability to provide alternative explanations, and their ability to challenge high ability students.

Lower level responses. No teachers indicated low levels of teacher efficacy beliefs in their ability to practice key instructional strategies for student achievement. The item that suggested any question about this capability was #23. Only one teacher expressed between “very little” and “some influence” in their ability to implement alternative strategies in the classroom.

Descriptive Statistical Analysis

The means and standard deviations for the IB teachers are presented below with the data from the comparative case study (Tschannen-Moran & Hoy, 2002).

Table 4.18 Descriptive Statistical Analysis of Sense of Efficacy in Instructional Strategies

IB Research (n=33)		Comparative Case Analysis (n=255)	
Means	Stan. Dev.	Means	Stan. Dev.
7.90	1.10	7.40	.95

*Note: Caution must be taken in interpreting the findings from a comparison of the two studies.
(See page 168.)*

An examination of tables 4.17 and 4.18 indicates that IB teachers consistently reported high levels of teacher efficacy beliefs concerning Instructional Strategies. They were more likely to respond at the second highest level, #8 on a 9 point scale, and were less likely to vary around the mean of 7.90 (standard deviation = 1.10). The mean rating of 7.90 for the 33 IB teachers was slightly higher than the mean rating of 7.40 for Instructional Strategies for the 255 teachers in the comparative study, some of whom may have been teachers of IB and gifted students. The responses on both studies were very similar; both varied little around the mean of 7 to 8. The standard deviation of 1.10 for IB teachers and the standard deviation of .95 for the case analysis teachers indicated little variation in ratings for both populations. The high level of teacher efficacy beliefs of International Baccalaureate teachers for instructional strategies is consistent with their high levels of performance in the practice of instructional skills found in Research Question 2.

TSES: Subscale for Efficacy in Classroom Management

Eight items loaded on the factor of classroom management. It was the one subscale for which teachers marked comments on the TSES. One teacher marked each of the items without any knowledge of the subscale divisions. The teacher commented, "Many of these questions don't seem appropriate for what I've experienced with our IB students." The observations of the 10 IB teachers indicated few classroom management problems. There were occasionally talkative students who were easily quieted with a few words from the teacher. Although it could be determined that classroom management difficulties were not indicative of IB classrooms, all the IB teachers observed also taught regular students in the general education setting. Their

responses indicated high levels of teacher efficacy beliefs in their capabilities to manage their classrooms whether IB or regular education.

Table 4.19
Teachers' Sense of Efficacy Scale: Subscale for Sense of Efficacy in Classroom Management

Teacher Beliefs		Nothing			Very Little			Some Influence			Quite a Bit		A Great Deal	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
Directions: The questionnaire is designed to help us gain a better understanding of the things that create difficulties for teacher in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential.														
Levels		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
3	How much can you do to control disruptive behavior in the classroom?	0	0	0	0	1	3	12	3	14				
5	To what extent can you make your expectations clear about student behavior?	0	0	0	0	0	2	3	7	21				
8	How well can you establish routines to keep activities running smoothly?	0	0	0	0	0	0	6	9	18				
13	How much can you do to get children to follow classroom rules?	0	0	0	0	1	1	15	4	12				
15	How much can you do to calm a student who is disruptive or noisy?	0	0	0	0	8	5	7	7	6				
16	How well can you establish a classroom management system with each group of students?	0	0	0	0	2	2	8	11	10				
19	How well can you keep a few problem students from ruining an entire lesson?	0	0	0	2	3	3	10	4	11				
21	How well can you respond to defiant students?	0	0	0	0	5	2	11	5	10				

Developers: Megan Tschannen-Moran, College of William and Mary, Anita Woolfolk Hoy, Ohio State University, 2001.

Categorical Analysis

The numbers and percentages of responses at each of the three categorical levels are presented below:

Table 4.20 Categorical Analysis of Sense of Efficacy in Classroom Management

Responses	nothing - very little #1,2,3	some influence #4,5,6	quite a bit- a great deal #7,8,9
# of Responses	0	40	224
% of Responses	0%	15.15%	84.85%

Higher level responses. As shown in Table 4.19, twenty-one teachers indicated their belief in their abilities to make their expectations clear about student behavior (#5) at the highest level of 9, “a great deal,” while only 12 teachers indicated the same level of belief in their ability to get children to follow classroom rules (#13). In addition, 31 teachers reported beliefs in the upper levels of 7, 8, and 9 for #5 establishing behavioral expectations and for #13 enforcing classroom rules. Eighteen teachers indicated the highest level of belief, “a great deal,” in their abilities to establish routines to create smooth running classrooms (#8). As shown in Table 4.20, the largest number of responses, 224 of 264, were recorded in the upper category of the scale, “quite a bit” to “a great deal,” (levels 7, 8, and 9) indicating high levels of teacher efficacy for classroom management.

Low level responses. Table 4.19 and Table 4.20 show no responses on any item at the lowest category 1-3 of teacher efficacy and, according to Table 4.20, only 40 or 15.2% of responses at the mid category of the teacher efficacy scale. The teachers showed lower levels of efficacy over classroom management with a disruptive or noisy student, with approximately 39% of teachers indicating they believed they had only “some influence” over this situation.

Descriptive Statistical Analysis

The means and standard deviations for the International Baccalaureate teachers are presented below along with the data from the comparative case study (Tschannen-Moran & Hoy, 2002).

Table 4.21 Descriptive Statistical Analysis of Sense of Efficacy in Classroom Management

IB Research (n=33)		Comparative Case Analysis (n=255)	
Means	Stan. Dev.	Means	Stan. Dev.
7.72	1.29	7.44	1.00

Note: Caution must be taken in interpreting the findings from a comparison of the two studies.

(See page 168.)

Although the population sample for the comparative study was extremely different, findings from a descriptive statistical analysis showed strong similarities. The findings indicated that both populations believed they had “quite a bit” or more ability to manage their classrooms. However, according to Table 4.21 the mean rating of 7.72 indicates that IB teachers were slightly more likely to rate themselves closer to a rating of 8 on the 9 point scale on sense of efficacy for classroom management than is indicated by the mean rating of 7.44 for the case analysis teachers. This rating is similar to the findings depicted categorically in Table 4.20 which found that 84.85% of responses by IB teachers were recorded at the upper category of “quite a bit” to “a great deal” (levels 7, 8, and 9). The scores for both populations varied from 1.00 for IB teachers to 1.29 for the case analysis teachers around the means of 7.72 and 7.44.

Summary of Question 4 Results

The analysis of teachers’ sense of efficacy for IB teachers is presented from two perspectives, through a categorical analysis and through a descriptive statistical analysis. The two perspectives develop a profile of IB teacher efficacy beliefs enabling an examination of the data from different perspectives while revealing similar findings on teacher efficacy beliefs.

The 33 IB teachers showed high levels of teacher efficacy on the total 24 item TSES scale and on the individual subscales. They were more likely to respond that they had “quite a bit” to “a great deal” of influence over student behavior and their ability to implement effective teaching strategies.

Table 4.22 below depicts the comparison among the levels of responses for the total 24 item TSES and the three subscales. The numbers and percentages of responses at the three categorical levels are depicted so as to allow for a comparison among the scales.

Table 4.22
Comparison of TSES and Subscale Categorical Analyses

Category Level	Student Engagement (n=264)		Instructional Strategies (n=264)		Classroom Management (n=264)		TSES (n=792)	
	# of responses	% of responses	# of responses	% of responses	# of responses	% of responses	# of responses	% of responses
1. nothing - very little #1,2,3	6	2.30%	0	0%	0	0%	6	.08%
2. some influence #4,5,6	114	43.18%	27	10.23%	40	15.15%	181	22.65%
3. quite a bit - a great deal #7,8,9	144	54.55%	237	89.77%	224	84.85%	605	75.76%

The numbers of responses for each category level and for the 24 item scale are derived from the total number of responses for that scale. They do not indicate the number of teachers who responded to each item or category. Thirty three teachers responded to 24 items on the Teachers' Sense of Efficacy Scale for a total of 792 responses. Eight of those items loaded on each subscale for a total of 264 responses on each subscale.

Table 4.22 indicates that the greatest number and greatest percentage of responses of IB teachers on the three subscales and on the 24 item scale tended to be at the highest category of "quite a bit" to "a great deal," (levels 7, 8, and 9) indicating high levels of teacher efficacy beliefs. The greatest percentage of responses by IB teachers (89.77%) at the highest category was reported for the subscale of Sense of Efficacy for Instructional Strategies, followed by 84.85% of responses at the third category for the subscale of Sense of Efficacy for Classroom Management.

A statistical analysis reveals similar high levels of teachers' sense of efficacy for IB teachers. A description of the means and standard deviations for the total TSES and the three subscales allows for limited comparison of the findings for the IB study and the Tschannen-Moran study used as a comparative case analysis. The data are presented in Table 4.23.

Table 4.23
Comparison of Descriptive Statistics for Teacher Efficacy Studies

Teachers' Sense of Efficacy Scale	IB Teacher Study (n=33)		Tschannen-Moran & Hoy Exploratory Case Analysis (n=255)	
	Means	Stan. Dev.	Means	Stan. Dev.
24 item total TSES	7.43	1.45	7.17	.84
Subscale for Student Engagement	6.67	1.60	6.66	1.02
Subscale for Instructional Strategies	7.90	1.10	7.40	.95
Subscale for Classroom Management	7.72	1.29	7.44	1.00

Note: Caution must be taken in interpreting the findings from a comparison of the two studies.

(See page 168.)

Both Table 4.22 and Table 4.23 indicate that IB teachers were likely to rate their teacher efficacy beliefs between levels 7 and 8 or at the upper third category. Similar results were found for the means and standard deviations in the IB study and in the comparison sample; however, the responses of IB teachers varied more around the mean scores in the 24 item scale and in each subscale than did the responses in the case analysis. This finding may likely be attributed to the

difference in the size of the population sampled. With the exception of the subscale for Student Engagement, the mean ratings of IB teachers tended to be somewhat higher than the mean ratings of teachers in the comparison sample. The subscale for Instructional Strategies showed the greatest mean difference with IB teachers rating their efficacy beliefs at 7.9 or closer to 8 on the 9 point scale while the mean rating of 7.40 for the comparative study teachers was closer to a rating of 7. A similar analysis can be made for the subscale of classroom management. The IB mean of 7.72 is closer to a rating of 8 while the mean rating of 7.44 for the comparison sample is closer to a rating of 7. Nevertheless, the ratings are more notable for their similarities than for their differences. Both populations indicated high levels of teachers' sense of efficacy.

Chapter 5

DISCUSSION, CONCLUSIONS, IMPLICATIONS

The research findings for this study developed a sequential profile of the International Baccalaureate teacher by first exploring a link between IB curricular and program goals and recommended practice for gifted and general education. A link would allow the assessment of the behaviors and practices of IB teachers within the gifted context using the approaches developed for general education. Findings on the four research questions are:

Finding related to Research Question 1: IB Program and Curricular Goals:

1. Research on the IB Program was minimal and concerned student achievement data pertinent to college and university admissions.
2. The preponderance of the literature on the IB Program pertained to program and curricular goals.
3. A study of IB program and curricular goals indicated an alignment with recommended practices for gifted and general education.

Findings related to Research Question 2: Instructional Skills

1. During the class period observed, IB teachers practiced numerous instructional strategies which centered around one overarching instructional approach.
2. Direct instruction was the major instructional framework used by IB teachers.
3. The variety of activities in which students were involved was minimal.
4. Questioning techniques were implemented by the 10 IB teachers to engage students in learning at high levels of complexity.

5. Mean ratings for IB teachers on an observation tool for effective teaching practices were comparable to the mean ratings for effective teachers in the comparison sample in their implementation of the instructional skill of instructional differentiation.
6. IB teachers were rated higher on the observation tool in their focus on learning, and in their implementation of the instructional skills of clarity, complexity, and expectations than were effective and ineffective teachers in the comparison sample.
7. Both IB teachers and effective comparison teachers were rated higher in their implementation of the instructional skills of differentiation, focus on learning, clarity, and complexity than were ineffective comparison teachers.

Findings related to Research Question 3: Assessment Practices

1. Questioning was used as guided practice to check for understanding in a variety of settings: whole class, small group, and individual conversations
2. Verbal feedback was consistent, often taking the form of probing questions to extend and assess learning.
3. High expectations for student achievement were emphasized although individual strengths and weaknesses were not addressed by most of the IB teachers.

Findings related to Research Question 4: Teachers' Sense of Efficacy

1. The findings on teachers' sense of efficacy of the IB teachers indicated greater teacher self efficacy beliefs on the factor of implementation of instructional strategies and classroom management than for the factor concerning their ability to affect student engagement.

2. IB teachers exhibited higher teacher-efficacy beliefs in areas that corresponded to instructional skill areas and assessment practices vital to higher level teaching and learning.
3. The findings on levels of International Baccalaureate teachers' sense of efficacy corresponded to the Tschannen-Moran findings on teachers in the general education setting.

Discussion

This study was essentially a two stage sequential examination of International Baccalaureate practices. The first stage of this study examined the alignment of International Baccalaureate program and curricular goals with recommended practices for gifted education. Once that alignment was determined, a profile of the practices of the IB teacher within the framework of recommended gifted practices could be identified.

To accomplish the first stage of the study, a comparative analysis was conducted on literature reviewing gifted education and the literature undergirding the International Baccalaureate Program. Through this review, 21 key practices for gifted education were identified. Literature on the International Baccalaureate Program revealed an emphasis on program and curricular goals and limited research based evidence aligning the goals to research and practice. Upon identification of the IB curricular and program goals, the study sought to determine their alignment with research based practices for gifted education.

The IB Program course structure was integral to the extent to which alignment with the 21 gifted practices could be determined. A one-year course structure acceded to the criticism of the National Research Council (Gollub, et.al., 2002) of a focus on breadth and content coverage at the expense of depth so vital to advanced learning. The IBO, however, asserted that IB course

structure was integrated over a two year period thus allowing for depth and complexity as well as breadth of coverage (Wallace, 2002). The observations revealed the two-year structure for core courses was the procedure in the two participating schools in this study. Therefore, this study of IB Program design was anchored within that context.

The results of the comparative analysis confirmed a favorable comparison between IB program design and the 21 gifted practices. Particular alignment was made to the practices of high expectations, authenticity of assessment, higher level thinking, acceleration, and depth, breadth and complexity. The sequential process of the content analysis indicated that IB curricular and program goals aligned with research based recommended practices for gifted and general education. It did suggest that IB teacher practices had not been the subject of much empirical research. The second stage of the study examined teacher practices within the context of aligned IB program goals and gifted practices within Stronge's Model of Effective Teaching (2002). The additional dimension of teacher efficacy was assessed using the research-based 24 item Teachers' Sense of Efficacy Scale.

Conclusions

Emerging Themes

The major result of this study was the identification of the teaching behaviors and practices of the International Baccalaureate teachers observed in this research. Observations revealed that ten teachers implemented several identified gifted practices during the class time observed with evidence that several other practices were implemented through the internal assessments outside of class time.

Theme 1: Instructional Differentiation

For this study the term differentiation referred to the variety of instructional strategies implemented in the classroom by the teacher “to differentiate instruction for individual or groups of students” (Stronge & Tucker, 2001). The ratings for the skill of instructional differentiation were based on three criteria:

- variety of student activities, each of 20 minutes or more, within a class block
- student engagement
- implementation of a variety of strategies

To establish teacher ratings for this skill area, a definition of “a variety of strategies” had to be determined. As described below, the perspective on the meaning of “a variety of instructional strategies” differs for general education and for gifted education. Gifted education emphasizes student-centered activities while general education emphasizes teacher-centered activities. Both perspectives can be considered to be strategies for appropriate instructional differentiation.

If a variety of instructional strategies would be defined as teacher-directed approaches that integrate student directed activities, the IB teachers were on target. Their behaviors provoked high levels of student engagement, thereby, supporting the literature that stated that student engagement is linked to the effective teacher’s facility in managing a range of strategies and levels of questioning. Gifted and high ability students function more optimally when they are actively engaged in their learning through a variety of instructional strategies (Renzulli, 1997).

However, if instructional differentiation were defined by the emphasis in gifted literature on student-directed activities that are significant problem-based projects selected by students and facilitated by the teacher (Feldhusen, VanTassel-Baska & Seeley, 1989; Renzulli, 1986, 1999;

VanTassel-Baska, 1993), the ten teachers were less on target. As was found in Research Question 1, student-directed strategies fit within the IB program design; however, their practice within class time was not extensive. Two teachers of the ten IB teachers focused class time on theme and problem-based learning. One teacher assigned a problem-based activity for 1/2 the class period and used direct instruction with questioning for the rest of the 90 minute block. Two other teachers assigned problem-solving activities during class time which were short term assignments, limited to 10 or 15 minutes in duration. The emphasis on assessments by the teachers and students suggested that the focus on direct instruction and other teacher directed strategies was a product of that emphasis.

Although generally their choice of strategies did not coincide with the emphasis on student-directed and problem solving approaches recommended for gifted education, they did produce the active engagement at a depth, breadth, and level of complexity of instruction recommended for gifted learners (Johnsen & Ryser, 1996; Renzulli, 1999; Speed & Appleyard, 1985). Thus, the observations revealed that student directed activities were more characteristic of internal assessment practices which were conducted outside of regular class time. Therefore, differentiation in the form of student-directed activities was implemented but, for the majority of observations, not within the context of the regular classroom.

Due to the impact on learning observed in the classrooms and the focus on alignment with recommended gifted practice, both interpretations of differentiation were considered in the ratings on this skill area. With the exception of instructional differentiation for student-directed activities, the IB teachers exhibited high levels of performance in this and the other four instructional skills areas. Their ratings on the Teachers Effectiveness Behavior Scale (Stronge & Tucker, 2001) were higher than the ratings on the same behavior scale for effective and

ineffective teachers in the comparative case analysis (Stronge, Tucker, & Ward, 2002). The mean score of 3.30 for IB teachers and 3.20 for effective case analysis teachers was not notably different, although both scores were markedly higher than the mean score of 2.33 for ineffective teachers. Since implementation of a repertoire of instructional skills is vital to effective instruction (Johnson, 1997; Peart & Campbell, 1999; Wang, Haertel, & Walberg, 1993a, 1993b) and is emphasized in gifted literature (Renzulli, 1997), the level of their implementation was a focus of the paper.

The observations revealed that teachers implemented various instructional strategies embedded within an overarching strategy. The major strategy, termed as the instructional framework, defined the instructional approaches of the teachers. Eight of the ten teachers used the strategy of direct instruction. It framed the approach to instruction for four of the ten teachers while four other teachers used it as an approach embedded within another framework: questioning, inquiry, or problem solving. Direct instruction seemed to lend itself to the incorporation of other activities, most markedly questioning which often served as guided practice after or during short lectures.

The strategy of direct instruction includes lecture, controlled and/or guided practice and independent practice and, therefore, allows whole group, small group, and individual work via one instructional strategy (Joyce, Weil, & Calhoun, 2000, VanTassel-Baska, 2003). Thus, the teacher may implement several instructional strategies within a single block of time. Recommendation for its implementation in the gifted classroom is guarded. As a teacher-directed approach it is appropriate for teaching complex concepts and thinking skills when tempered with teacher facilitation (VanTassel-Baska, 2003).

Differentiation through the implementation of a variety of strategies creates optimal learning opportunities and, therefore, engagement for all students (Bransford, Brown, & Cocking, 2000) whether in a gifted or general education setting. Students in the ten IB classes were actively engaged at high levels of complexity, generally through questioning during and after instruction; although the differentiated instructional strategies were essentially teacher-directed rather than student-directed. This approach is a departure from alignment with recommended gifted practices that integrate teacher-centered and student-directed activities within the classroom (Carnine, 1993; Renzulli, 1997).

Theme 2: Questioning

Questioning and instruction. Questioning was observed to be an integral component of instruction that promoted high level engagement and fast-paced discussions for each of the ten teachers. Questioning was the primary vehicle through which the five instructional skills and the two assessment practices were conducted. Teachers framed questions to lead students to clarify conceptual understanding, to provide evidence supporting their thought processes, and to discover information. As an expression of high expectations, probing questions were asked to guide students through increasingly higher levels of complexity. Teachers also checked for understanding and provided verbal feedback in the form of questioning rather than in the form of verbal praise.

The findings from the observations indicated that the IB teachers' skillful use of questioning aligned with recommended gifted practices and research on questioning practices. Their levels of complexity of questioning reflected the levels of complexity of the content and the level of understanding of the students (Renzulli, 1999; Maker & Nielson, 1996; VanTassel-Baska & Little, 2003). Their questioning techniques echoed Henderson's (1996) findings that

effective teachers of advanced students asked more questions, had higher levels of student engagement during questioning, and had greater participation rates during questioning,

However, in a departure from recommended gifted practice, teachers more frequently expounded on student answers and answered student questions rather than reflecting answers and referring the questions to other students. Unlike the findings of Silverman (1995) in observations of teachers of gifted at all grade levels, reflection of answers was observed to be an uncommon practice, engaged in by only three of the ten IB teachers.

Questioning and mutuality. Questioning sessions were generally teacher-directed activities; however, they often progressed beyond discussions into conversations between the teacher and the students. The conversational tone was characteristic of the trusting relationship characterized by Heath (1997) as mutuality. This concept is discussed more thoroughly in Unanticipated Finding 1.

Theme 3: Consistency of Findings

As found in Research Question 1, the IB program design goals aligned themselves with gifted practices. The same goals and practices were found through observation to be implemented by the teachers in the IB classroom. Finally the same practices were recorded on the TSES as the areas in which teachers had the greatest level of teacher efficacy beliefs. The instructional skills from the Teacher Effectiveness Behavior Scale (Stronge & Tucker, 2002), observed to be characteristic of IB teachers, are aligned in Figure 5.1 and Figure 5.2 with the major findings from the TSES questionnaire administered to the IB teachers. The efficacy subscales of instructional strategies and student engagement were pertinent to the study of instructional skills and assessment practices of IB teachers.

The practices implemented by IB teachers were manifested in the alignment of program design and gifted practices, evident consistently during the observation of IB teacher instructional practices, and revealed in the IB teachers' responses to four items on the Teachers' Sense of Efficacy Subscale for Student Engagement and to all eight items on the Teachers' Sense of Efficacy Subscale for Instructional Strategies. The items on the two efficacy subscales with ratings indicating the highest levels of efficacy beliefs for IB teachers and the corresponding teacher practices are depicted in Table 5.1 and Table 5.2 which illustrate this consistency in findings.

Figure 5.1
Comparison of Teacher Effectiveness Behavior Scale Skill Areas to Items on the Teachers' Sense of Efficacy Subscale for Student Engagement

Student Engagement Subscale Item	Teacher Effectiveness Behavior Scale Skill Areas						
	Instructional Differentiation	Instructional Focus on Learning	Instructional Clarity	Instructional Complexity	Expectations for Student Learning	Assessment for Understanding	Quality of Verbal Feedback
The teacher's ability to...							
2. help students think critically				X			
6. get students to believe they can do well		X	X			X	X
9. help students to value learning		X					
12. foster student creativity	X			X	X		

Table 5.1 indicates a favorable comparison between student engagement subscale items pertaining to higher level learning and instructional practices of effective teachers. The ratings of IB teachers indicated high self-efficacy beliefs in their ability to influence students to think critically, to believe they can do well in school, to value learning, and to foster creativity. The teachers who believed in their abilities to enable students to believe they could do well were the teachers who exhibited high levels of skill in instructional focus on learning, instructional clarity,

assessment for understanding, and quality of verbal feedback. The IB teachers who had high levels of belief in their abilities to be successful in fostering student creativity were rated high for their implementation of the skills of instructional differentiation, instructional complexity, and high expectations for student learning. The IB teacher's successful implementation of instructional complexity resulted in high self-efficacy beliefs in their ability to enable students to think critically.

Table 5.2 illustrates the consistency of findings between the Subscale of Instructional Strategies and instructional practices on the Teacher Effectiveness Behavior Scale.

Figure 5.2
Comparison of Teacher Effectiveness Behavior Scale Skill Areas to Items on the Teachers' Sense of Efficacy Subscale for Instructional Strategies

Instructional Strategies Subscale Item	Teacher Effectiveness Behavior Scale Skill Areas						
	Instructional Differentiation	Instructional Focus on Learning	Instructional Clarity	Instructional Complexity	Expectations for Student Learning	Assessment for Understanding	Quality of Verbal Feedback
The teacher's ability to...							
7. respond to difficult questions			X				
10. gauge student comprehension						X	
11. craft good questions	X						
17. adjust lessons to proper level for individual students						X	
18. variety of assessment strategies						X	
20. provide alternative explanations & examples					X		
23. implement alternative strategies	X						
24. provide appropriate challenges to capable students		X		X			

Seven of the eight items on the instructional strategies subscale corresponded to an instructional skill or assessment practice area on the Teacher Effectiveness Behavior Scale. High

self-efficacy beliefs on item #24, the ability to “provide appropriate challenges to capable students” was consistent with the teacher with high ratings on instructional focus on learning and instructional complexity. High levels of belief on the subscale item and high levels of performance in both skill areas are vital characteristics for effective teaching of students in advanced academic programs.

Theme 4: Assessments

The observations indicated that the teachers designed their instruction to teach students at the high levels of performance required on the assessments and to ensure they learned the concepts to be examined. Teachers either directly addressed student questions about or preparation for internal or external assessments, planned internal assessments with students, discussed former tests that incorporated IB questions, related new concepts to assessments, or taught concepts and skills to prepare students for internal assessments. Teachers’ assessment practices mirrored the anecdotal evidence contributed by Rothman (2002) that the assessments determined the approach to instruction.

Slightly beyond that, it could be said that references to assessments by each of the 10 teachers indicated that assessments were the force driving the intensity, clarity, and complexity of instruction and the concentrated focus on instruction. Although frustration was evident in students’ questions about external exams, the design of standards based external and internal assessments resulted in promoting high level performance by teachers and students and provided the avenue for students to direct their own activities. Internal assessments such as the Group 4 Science Project were designed and conducted by students. The design and practice of internal assessments replicate the emphasis in gifted literature on the importance of significant problem-

based projects with a global perspective that are selected by students and facilitated by the teacher (Feldhusen, VanTassel-Baska & Seeley, 1989; VanTassel-Baska, 1993).

Theme 5: High Teachers' Sense of Efficacy and Risk Taking

The mean score of 7.43 on the 24-item Teachers' Sense of Efficacy Scale and the approximate score of 8 on a 9-point scale indicated high levels of teacher efficacy for International Baccalaureate teachers (11th and 12th grades). This finding supported the 1992 study of teachers of high ability students by Raudenbush, Rowan, and Cheong (in Ross, Cousins, & Gadalla, 1996) in which secondary education teachers reported higher teacher-efficacy if they had highly engaged students of a higher ability and grade level.

The findings of the meta-analysis by Ross, Cousins, & Gadalla (1996) were inconsistent with the practices of ten teachers during the observations. The study described high self-efficacy teachers as risk-takers who were more likely to experiment with teaching strategies that stretched student and teacher comfort levels and were less likely to rely on traditional lecture and other teacher-centered approaches. The suggestion that high efficacy teachers are less likely to be teacher-centered was not confirmed by the observation findings. Nine of the 10 teachers taught using teacher directed approaches. For four of the teachers the distinctly teacher-centered approach (Joyce, Weil, & Calhoun, 2000) was direct instruction. For five additional teachers the teacher directed approaches were questioning and problem solving

There is evidence that risk taking for IB teachers, however, takes a form other than student directed in-class instruction. IB teachers may be characterized as risk takers simply through their involvement in the IB Program. Ross's study (1994) of teachers with high levels of teacher-efficacy beliefs found high efficacy teachers were more likely to "implement innovative programs." Internal assessments, IB required student directed assessments conducted outside of

class time, could very well be considered to be teacher comfort-level stretchers. Internal assessments are those assessments required by the IB Program in addition to external assessments (end-of-course exams). They are facilitated and assessed by teachers and sent to the IB Organization for review (IBO, 2002c). Due to the requirements and high expectations of these assessments, students and teachers invest a considerable amount of time together beyond class time. Students take responsibility for the assignments, and teachers are permitted to do no more than facilitate the process and grade the product. However, teachers are ultimately responsible for the process, product, and grading which are closely reviewed by the IB Organization (IBO, 2002b).

Unanticipated Findings

Unanticipated Finding 1: Mutuality

This study intended to create a profile of the International Baccalaureate teacher by examining instructional skills, assessment practices, and teacher efficacy beliefs. However, a dimension was discovered that went beyond implementation of recommended classroom practices but appeared to result from a program design that required high level instruction, achievement, and assessment in and outside of class time. This dimension revolved around a relationship between teachers and students characterized by mutuality.

The relationship observed between the 10 teachers and their students was relatively formal during lecture and very informal or mutual during questioning, planning, and non-instructional time. When teachers were imparting important content, instruction was often direct instruction, during which students were attentive, engaged in listening, taking notes, and asking questions. At other times this teacher-directed tone was replaced by an informal interactive relationship.

Questioning sessions and non-instructional interactions revealed a dimension to the teacher student relationship that is appropriately described as mutuality (Heath, 1997). Questioning opened as formal question and answer sessions and often progressed beyond discussions into conversations in which questions, comments, and answers were contributed by students as often as by teachers. Newmann and Wehlage (1995) referred to this type of interchange as “substantive conversation” during which concepts were explored at high cognitive levels. These sessions often flowed into personally revelatory conversations that were exemplary of the warmth and respect found to be characteristic of the personal student teacher relationship in gifted settings. Literature supports the concept of the effective teacher as one who risks self-revelation by revealing personal information to individual students in informal classroom discussions (Carper, 2002; Heath, 1997; Silverman, 1995). This mutuality was characteristic of the interchange witnessed in the IB classroom.

Interchanges between T1, T5, and T7 and their students evidenced this relationship. After T1 and students completed their discussion of sensory perceptions, announcements were made on the public address system and students prepared to leave for the next class. They paused, however, to look at and discuss photographs, projected on a large monitor, of the teacher’s daughter stationed in Iraq.

At the beginning of class, T5 expressed concern over a missing student. When the student arrived late to class, T5 said with apparent relief, “There she is. I knew she’d be here.” Later during the quiz when the student went to the teacher, she was crying. Rubbing her back and placing an arm around the girl’s shoulders, T5 allowed her to go the restroom during the quiz. T5 later revealed the girl was not feeling well, but did not want to miss class.

In T7's class while the teacher and students waited to receive instructional materials, the teacher and the students planned sending flowers to an injured classmate and contributing gifts for an Adopt a Child project.

The observations suggested that the core of this added relational dimension might be a product of the mutual responsibility for the external assessments (end-of-course assessments) and the time teachers and students spent out of class time planning and conducting internal assessments. During class time as external assessments were discussed or internal assessments were planned, the tone lapsed into the relaxed mutuality of responsibility. In particular, planning by T10 and students for the after-school Group 4 Project (internal assessment) meeting was conversational and had the essence of a joint effort, rather than a teacher-directed activity. An accurate profile of the International Baccalaureate teachers includes a dimension beyond that which can be observed within the confines of the classroom.

Unanticipated Finding 2: Teachers' Sense of Efficacy Study Population

The population who responded to the Teachers' Sense of Efficacy Scale consisted of 33 teachers of International Baccalaureate students in two schools. The findings from analysis of the teachers' responses were markedly similar to the findings from a study by Tschannen-Moran of 255 teachers of all grade levels in an urban area. The great difference in the size of the two samples seemed to have little effect on the mean scores. Table 5.3 illustrates the relative consistency of findings in the two studies.

Table 5.3
Comparison of Descriptive Statistics for Teachers' Sense of Efficacy Studies

TSES Scale	IB Teacher Study (n=33)		Tschannen-Moran Exploratory Case Analysis (n=255)	
	Means	Stan. Dev.	Means	Stan. Dev.
TSES	7.43	1.45	7.17	.84
Subscale for Student Engagement	6.67	1.60	6.66	1.02
Subscale for Instructional Strategies	7.90	1.10	7.40	.95
Subscale for Classroom Management	7.72	1.29	7.44	1.00

Note: Caution must be taken in interpreting the findings from a comparison of the two studies. (See page 168.)

The means for the subscale for student engagement were almost identical for the two populations. However, there was a moderate difference in favor of the IB teacher on the total 24 item Teachers' Sense of Efficacy Scale and the two subscales of instructional strategies and classroom management. The score variation was somewhat greater for the IB teachers for the 24-item TSES and for the subscale for student engagement. However, none of the findings was notably different for the two populations. A plausible explanation for this relative consistency could be the demographics behind the demographics. Each of the 33 teachers also teaches non-IB classes.

Both IB teachers and the sample population were likely to rate their teacher efficacy beliefs between levels 7 and 8 for all scales except for the subscale for student engagement.

Similar results were found for the means and standard deviations in the IB study and in the comparison sample; however, the responses of IB teachers varied more around the mean scores in the 24 item scale and in each subscale than did the responses in the case analysis. This finding may likely be attributed to the difference in the size of the population sampled.

With the exception of the subscale for Student Engagement, the mean ratings of IB teachers tended to be only somewhat higher on the 9 point scale than the mean ratings of teachers in the comparison sample. The subscale for Instructional Strategies showed the greatest mean difference. On this subscale IB teachers rated their self-efficacy beliefs at 7.9 or closer to 8 on the 9 point scale while the mean rating of 7.40 for the comparative sample was closer to a rating of 7. A similar analysis can be made for the subscale of classroom management. The IB mean of 7.72 is closer to a rating of 8 while the mean rating of 7.44 for the comparison sample is somewhat closer to a rating of 7. Nevertheless, the ratings are more notable for their similarities than for their differences. Both populations indicated high levels of teachers' sense of efficacy.

Unanticipated Finding 3: Internal Assessments

In addition to external (end-of-course) assessments, the International Baccalaureate Program requires community service, an Extended Essay, and internal assessments. The Extended Essay, as described in chapter 2, is a 4000 word essay on original research on a topic of particular interest to the students. Internal assessments are conducted outside of class time, graded by IB teachers, and sent for moderation (review) by IB examiners (IBO, 2002b). As designated in IB program design and practiced by the participating schools in this study, these three components of program design are student directed activities, discovery activities and inquiry or problem-solving activities. As student directed and teacher facilitated activities from design through implementation, they coincide with highly recommended gifted practices.

Although in class instruction seems to be driven by external assessments to focus on direct instruction and questioning, the three components provide the means by which IB coincides with recommended student directed gifted practices. These components seemed to create a dimension to the act of teaching and learning beyond the classroom.

Unanticipated Finding 4: Verbal Praise

Verbal praise was a means of verbal feedback used to a very limited extent by only two teachers. The 10 teachers essentially used further challenges and assignments and probing questions rather than verbal praise to encourage high achievement. It appeared to be a successful approach to verbal feedback since conversations were dynamic and complex, and engagement was dynamic. It might be concluded that the conversational climate and the mutuality that characterized relationships made praise extraneous. The deficiency of praise did not seem to adversely affect teacher student rapport or discourage student participation at high levels of complexity.

Consequent Theme

Consequent of the findings discussed as Themes and Unanticipated Findings, the impact of assessments and the approach to instruction combined to formulate a theme that wove through each of the observations. While the research was intended to examine the instructional skills and assessment practices implemented by IB teachers, a relationship was established between the two – assessment and instruction – that profiled the IB teacher and the IB experience observed in this study. This profile consisted of the direct instruction approach to classroom instruction and student independent study outside of class time both of which appeared to be driven by assessments. It can be expressed formulaically as $A \rightarrow DI + IS$.

The majority of class activities were teacher-directed, involving direct instruction either as the major approach to instruction (for four teachers) or as a vital component of instruction (for four additional teachers). The direct instruction approach allowed the embedding of a variety of differentiated strategies such as questioning, problem-solving activities, and group work through which high levels of instructional clarity, instructional complexity, focus on learning, and high student achievement expectations were implemented. The discussion of assessments in every classroom observation indicated that the assessments were the driving force behind the teacher-directed focus on direct instruction.

Students conducted other assessments, known as internal assessments, outside of class time. They were facilitated, but not directed, by teachers. While teacher-direction characterized the tenor of instruction during class time, student-directed independent study (either individual or group independent study) characterized the work conducted for assessments outside of class time and seemed to be the underlying force affecting the mutual student/teacher relationship. The Group 4 Project described above is a prime example of this type of student-directed independent activity. Additionally, the Extended Essay, a 4000 word essay on original research, is a project conducted almost exclusively by the student with guidance, rather than intervention or direction, from a teacher who serves as a mentor.

This profile of the IB experience can be expressed formulaically as $A \rightarrow DI + IS$,
Assessment drives Direct Instruction and Independent Study.

Recommendations for Research

Recommendation 1: Mutuality

As discovered in the observations, the dimension of teaching and learning and student teacher interaction seemed to go beyond the IB classroom. Although IB teachers were essentially

teacher directed within the classroom as they taught lesson content, their interaction with students concerning external assessments and internal assessments outside of class time suggested collaboration rather than teacher control. A study that examined the mutuality of this relationship and the additional responsibilities of the IB teacher in conjunction with their classroom practices would provide a comprehensive profile of the IB teacher.

Recommendation 2: Professional Development

The findings of this study underscore the need for professional development for IB teachers if the full intent of IB program and curricular goals are to be fully realized. IB workshops taught program goals but did not teach pedagogy; therefore, teachers were not prepared with an arsenal of strategies appropriate for accomplishing program goals. Although internal assessments and other components require student choice and direction, teachers were not taught the student-directed strategies to promote critical and creative thinking integral to student investigation. The National Research Council findings reported the failure of IB teacher training to address these areas adequately and recommended improvement in professional development (Gollub, 2002). As a result the organization has redesigned its teacher training to focus on training that advances both content and pedagogical knowledge (Bechtel & Waterson, 2003; R. Cline, personal communication, July 17, 2003). "Areas of particular interest include teachers as learners, teachers as managers of learning, teachers as innovators, the teacher-student relationship in learning, and the training and recruitment of teachers for international education" (Thompson, 1999). It is recommended that further study of the redesign of professional development focus on the alignment of professional development with the teaching practices recommended for gifted and high ability education and the best practices for general education.

Recommendation 3: Questioning Strategies

This research indicated teachers asked high numbers of questions at varying levels of complexity. The scripts revealed the numbers of questions ranged from 6 to approximately 147 within a 60 minute time period. The mean number of questions asked was approximately 58. The accuracy of that statistic is not precise, however, since the observations were not taped and questions asked in interaction with individuals and small groups were not heard and, therefore, not scripted. Taping observations would allow greater accuracy in analyzing questioning frequency and level and would enable a comparison with Henderson's 1996 findings on the frequency of questioning among Advanced Placement teachers.

Recommendation 4: Program Relevance

A danger education faces is its possible lack of relevance. Eisner (2004) warned that schools whose programs are essentially designed to prepare students for college and/or careers run the risk of being "intellectually irrelevant." Their curricula "become little more than hoops through which students learn to jump in order to move ahead" (p.5). Appropriate questions for schools to ask are whether they are teaching students to live in the real world, to be wise in their judgments and decisions, and to be critical thinkers (Eisner, 2004; Sternberg, 2003). The real world perspective is reflected in the excerpt from the revised IB Mission Statement.

The International Baccalaureate Organization aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. (IBO, 2003a, p. 2)

The original Mission Statement addresses the issue more emphatically:

Beyond intellectual rigour and high academic standards, strong emphasis is placed on the ideals of international understanding and responsible citizenship, to the end that IB

students may become critical and compassionate thinkers, lifelong learners and informed participants in local and world affairs, conscious of the shared humanity that binds all people together while respecting the variety of cultures and attitudes that makes for the richness of life. (IBO, n.d. p.1)

International research conducted by Duevel (1999) on IB graduates' satisfaction with the program focused on their satisfaction from the perspective of adequacy of college preparation and match of college major with career. A majority of the respondents reported that their involvement in the IB favorably impacted their university performance, and 82% were employed in professions associated with their undergraduate majors. However, more research needs to be conducted on the real world relevance of the IB as stated in its Mission Statement? Does the highly structured program develop critical and inquiring minds who are global thinkers? Do IB students find the intensity and rigor of study yield the promised results? Is the learning relevant to their lives, to the real world in which they live and will encounter outside of school? Is the international focus as implemented in schools relevant to global realities? Academics involved in the IB assert the answer to all these questions is a definite affirmation. College and university admissions officials praise the quality, insight, and high level thinking of IB graduates (Rick Arrington, IB Recruiter, University of Tulsa, personal communication, March 14, 2003; Kim Baker, Assistant Dean of Admissions, College of William and Mary, personal communication, October, 2003). As impressive as are these opinions concerning IB students, longitudinal studies on the success of IB students and the success of the program are sorely lacking.

As the IB Program expands, it reaches more students and impacts legislation (U.S. Department of Education. 2001). Currently, 50% of the students in the program are schooled in the United States (IBO, 2003a), a country whose citizens and professionals demand

accountability (Gollub, Bertenthal, Labov, & Curtis, 2002). Therefore, it is to the benefit of the IB Organization that it recognizes the need for program study and is seeking research on its efficacy (Wallace, 2002).

Summary

In light of the national popularity of and attention on advanced academic programs, the accord of their philosophical and pedagogical underpinnings with teaching and learning theory is under scrutiny. Along with other advanced programs, the International Baccalaureate Program has become a recommended option for a rigorous college preparatory education for gifted and high-end learners (Feldhusen, VanTassel-Baska, & Seeley 1989; Matthews, 2002a; Nugent & Karnes, 2002; Renzulli, 1997; Speed & Appleyard, 1985). However, limited research has been conducted on the teaching and learning practices of both the IB Program and on the teachers who are responsible for leading students to high levels of achievement.

During its two year study of nationally recognized academic programs for advanced study of mathematics and science in United States high schools, the National Research Council (NRC) found that critical data on teaching and learning for these programs was deficient (Gollub, J., Bertenthal, M., Labov, J., & Curtis, P., 2002). The literature on the IB was limited to anecdotal evidence, speculations on recommended practice, and research providing data on IB students - their satisfaction with the program, their high levels of performance on standardized examinations, and their success in college and university settings (Dueval, 1999; Kolb, 1999; Kolb, 2002; Scaturro & Campbell, 2003). Research did not provide evidence indicating how the IB accomplishes high levels of success. It did not address the questions posed by the National Research Council (Gollub, et.al., 2002) on the instructional practices of IB teachers or on the consistency of teacher practices with current research on teaching and learning. Considering the

imperative to provide evidence of its viability as an option for general and advanced education, this research was conducted to determine the consistency of the teaching practices of teachers in the IB with those recommended for teaching in general education and advanced academic settings.

This study first examined the areas of alignment between the IB program and curricular design with recommended practices for gifted education. As a recommended option for gifted students, the determination of this alignment was an important component. Through a sequential process, the three major aspects of the program – program design, student outcomes, and assessments were found to align with 21 gifted practices. The next step was to examine the implementation of the gifted practices by teachers within the classroom. Ten 60 – 90 minute observations of 10 IB teachers were conducted in two different venues using the Teacher Effectiveness Behavior Scale of Stronge and Tucker (2002). Teachers' instructional practices were assessed on two research-based dimensions of the scale: six instructional skills and two assessment practices.

The additional dimension of teacher efficacy was assessed using the research-based 24 item Teachers' Sense of Efficacy Scale developed by Tschannen-Moran and Hoy (2001). The construct of teacher efficacy is a significant variable predictive of teaching effectiveness and student performance. Although a teacher may have sufficient knowledge of content and training in pedagogy, the teacher's judgment of his or her ability to perform the task at hand is a powerful factor affecting teacher performance (Hall, et.al., 1992; Ross, 1994a, 1994b, 1998; Tschannen-Moran, Hoy & Hoy, 1998). With the understanding that a teacher's perceptions of ability to perform tasks were integral to student learning, it was clear that the construct was an important factor for this advanced educational program.

The study confirmed that IB teachers performed at high levels in the classroom, using a variety of instructional strategies. Although differentiation of instruction was directed towards teacher-directed strategies, instruction was not limited to the classroom. It appeared that teacher-directed strategies were more characteristic of the classroom approach to instruction, but there was evidence that student-directed activity was the approach for internal assessments conducted outside of the class period. The instructional approaches implemented during class time were direct instruction, questioning strategies, problem-solving, and inquiry activities. Teachers implemented several different strategies within their characteristic instructional approaches so that the teacher who focused on questioning also involved the students in small group activities, lecture, and demonstrations. The teacher who focused on direct instruction also involved the students in questioning sessions, group and or individual work, and short-term problem solving activities.

The IB teacher profile depicted the teacher with a consistent focus on instruction from bell to bell, high levels of instructional clarity and complexity, and extremely high expectations for student learning in and out of class. The student and teacher relationship was characterized by mutuality (Heath, 1997) rather than by teacher control which seemed to be appropriate for the high levels of performance required of students and teachers in the decidedly structured IB Program. The findings from the Teachers' Sense of Efficacy Scale indicated that thirty- three of the teachers had strong beliefs that their teaching abilities and strategies were adequate for the teaching task. This was the additional component impacting high achievement required of students.

The highly structured nature of the course and assessment design of the International Baccalaureate Program and the high levels of achievement and production required of students

necessitates a teacher who is willing to and capable of assuming the challenge of that structure.

The profile of the IB teacher to be developed in this study consisted of implementation of instructional skills and assessment practices in conjunction with the teachers' beliefs in the adequacy of their abilities and strategies to perform the high level tasks required of them.

Although this study does not paint a comprehensive picture of the IB teacher, it opens a window to understanding on the teaching practices and beliefs of these individuals.

APPENDIX

From: "Denise Ridley-Hinrichs" <drridl@wm.edu>
To: lhjrapha@yahoo.com
Date: Fri, 14 Nov 2003 14:03:00 -0500
Subject: SOE Committee Approval of #2003050
CC: tjward@wm.edu

Dear Mrs. Hutchinson:

Your proposal titled "Recommended Practices for Effective Teaching in the International Baccalaureate Program . . ." has been exempted from formal review by the School of Education Internal Review Committee (SOE IRC) because it falls under one of six exemption categories defined by DHHS Federal Regulations 45CFR 46.101.b.

Please insert the following statement in the footer of any cover letters, consent forms, etc.:

THIS PROJECT WAS FOUND TO COMPLY WITH APPROPRIATE ETHICAL STANDARDS AND WAS EXEMPTED FROM THE NEED FOR FORMAL REVIEW BY THE COLLEGE OF WILLIAM AND MARY PROTECTION OF HUMAN SUBJECTS COMMITTEE (PHONE: 757-221-3901) ON NOVEMBER 14, 2003 AND EXPIRES ON NOVEMBER 14, 2004.

You are required to notify Dr. Thomas Ward, Chair of the SOE IRC, and Dr. Stan Hoegerman, Chair of the Protection of Human Subjects Committee, if any issues arise with the participants of this study.

Good luck with your project.
Denise

~~~~~  
Denise Ridley-Hinrichs  
Grants and Research Administration  
<http://us.f203.mail.yahoo.com/ym/Compose?To=denise.ridley-hinrichs@wm.edu&YY=31276&order=down&sort=date&pos=0&view=a&head=b>  
<http://www.wm.edu/grants>  
phone: 757.221.3901  
fax: 757.221.4910



Linda P. Hutchinson  
Doctoral Candidate – The College of William and Mary  
204 Robanna Dr.  
Seaford, Virginia 23696-2424  
757-896-8177 (work)  
757-898-1964 (home)

November , 2003

Dear (Teacher),

As a Doctoral Candidate at the College of William and Mary, my research interest is effective teaching with a focus on the practices of International Baccalaureate teachers. Specifically my dissertation research project is examining the instructional strategies and teacher-efficacy beliefs of IB teachers.

The *No Child Left Behind Act* of 2001 includes the IB as an option for educational reform; however, the NCLB also requires any academic option to be based on careful research. In its 2002 report, the National Research Council called for research on IB practices. In addition, the IB is enthusiastic about the conducting of research on the quality of its programming.

Your district's assistant superintendent and your principal, -----, have graciously granted approval for the conducting of my research in your IB Program. This is where I need your assistance. I am seeking your response to the questionnaire, Teachers' Sense of Efficacy Scale, which looks at the teacher's perceptions of his or her capability to affect student engagement and learning. I anticipate that the questionnaire will take approximately 10 minutes to complete. The questionnaire is attached with a stamped, self-addressed envelope in which you may return the questionnaire. Your principal also has a large envelope in which all the questionnaires may be returned at once. You may choose to return your questionnaire in the principal's envelope. Please do so by November ---, 2003.

In addition, I am seeking to observe the instructional practices of 5 IB or PIB teachers. During one 60-90 minute observation per teacher, instructional practices will be recorded on the Teacher Effectiveness Behavior Scale. Teachers will be chosen through a random selection process. If you do not desire to be included in the selection process, please indicate your intention by checking the box the bottom of this letter. An additional stamped, self-addressed envelope is included in which to return the slip. If you choose not to participate, please return this letter by November ---, 2003.

Please be assured that participation in this study is completely voluntary and that all participants are assured of complete anonymity. My dissertation advisor and I will know only from which school the data was obtained. The information will not be linked to a specific teacher. All information will be presented in an anonymous manner in my final report. The names of the school district and the school will not be divulged. In addition if you choose not to participate in the selection process for the observation, this decision will also not be divulged.

Please be aware of how much I appreciate your involvement in this project. I know that teaching, especially in the IB, is a demanding profession that requires a great deal of time.

Should you have any questions, please do not hesitate to contact me or my dissertation advisor, Dr. James Stronge at 747-221-2339. You may report dissatisfactions with any aspect of this experiment to the Chair of the Protection of Human Subjects Committee, Dr. Stan Hoegerman, at 757-221-2240.

Again, I would appreciate your response by November ----, 2003.

Sincerely,

Linda P. Hutchinson  
Doctoral Candidate

\_\_\_\_ I do not wish to be included in the selection process for observation.

Name \_\_\_\_\_ School \_\_\_\_\_

Linda P. Hutchinson  
Doctoral Candidate – The College of William and Mary  
204 Robanna Dr.  
Seaford, Virginia 23696  
757-896-8177 (work)  
757-898-1964 (home)

November 16, 2003

Dear (Principal);

First of all, congratulations on earning the honor of doctor, a well deserved honor. Thank you for the opportunity to conduct the research for my doctoral dissertation at \_\_\_\_\_ High School. The Human Subjects Review Committee at the College of William and Mary has approved my request stating:

THIS PROJECT WAS FOUND TO COMPLY WITH APPROPRIATE ETHICAL STANDARDS AND WAS EXEMPTED FROM THE NEED FOR FORMAL REVIEW BY THE COLLEGE OF WILLIAM AND MARY PROTECTION OF HUMAN SUBJECTS COMMITTEE (PHONE: 757-221-3901) ON NOVEMBER 14, 2003 AND EXPIRES ON NOVEMBER 14, 2004.

In order to respect the pressure of exam preparation on IB teachers during the last semester and to be able to conduct my research according to the timeline, the research schedule allows for the completion of the classroom observations and the short questionnaire before winter break. I have requested the teachers to complete the short questionnaire by December 1 and would like to conduct the 5 observations over days during the time period from December 5-11.

The questionnaire will take approximately 5-10 minutes to complete and there will be 5 observations of 60-90 minutes each. The teachers will be chosen by random selection. I have included the following items in this packet:

- cover letter
- Teachers' Sense of Efficacy Scale – 24 item questionnaire
- Teacher Effectiveness Behavior Scale – instrument to describe instructional skills and assessment skills
- Questioning Techniques Analysis Chart – instrument to record levels of questioning based on Bloom's Taxonomy

In addition, I will request permission of the teachers to record the observations on audiotape in order to insure the accuracy of my written record.

The teacher packets accompany this packet. I request that they be distributed on Friday, November 21, 2003.

I look forward to seeing you soon. Do not hesitate to contact me with questions.

Sincerely,

Linda P. Hutchinson

Linda P. Hutchinson  
Doctoral Candidate – The College of William and Mary  
204 Robanna Dr.  
Seaford, Virginia 23696  
757-896-8177 (work)  
757-898-1964 (home)

December 7, 2003

Dear (IB Teacher);

Thank you for your willingness to give of your time to assist me with my dissertation research. Please accept this small token of my appreciation for your completion of the questionnaire. Your participation is vital to understanding the success and responsibilities of IB teachers.

Once I again I assure you that your responses are totally anonymous.

For those who were unable to complete and return the Teachers' Sense of Efficacy Scale as of yet, I have enclosed another copy in this envelope. If you have not already done so, I encourage you to take a few minutes of your time to complete it, place it in this envelope, and return it to the mailbox of either (Principal) or (IB Coordinator).

Again, your participation is vital to the validity of this research and is greatly appreciated.

Sincerely,

Linda P. Hutchinson

## Teacher Effectiveness Behavior Scale

### Area I: Instructional Skills

Effective teachers organize for instruction by maintaining and communicating a focus on instruction, demonstrating high expectations for students, allocating time, and engaging in effective planning. Responsive instruction hinges on a flexibility and facility with a variety of teaching strategies. Teachers who successfully employ a range of strategies reach more students because they tap into more learning styles and student interests.

| <u>Title and #</u>                                | <u>Data Source</u> | <u>Level 4</u>                                                                                                                                                     | <u>Level 3</u>                                                                                                                                    | <u>Level 2</u>                                                                                                                   | <u>Level 1</u>                                                                                                                 |
|---------------------------------------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Instructional Differentiation</b><br><br>I-1   | CO                 | The teacher uses a broad repertoire of instructional strategies with fluency and flexibility to differentiate instruction for individual or groups of students.    | The teacher uses an adequate variety of instructional strategies that appeal to the interests of different students with limited differentiation. | The teacher uses a limited number of instructional strategies primarily to whole class with little or no differentiation.        | The teacher relies heavily on one or two instructional strategies primarily involving lecture or seatwork for the whole class. |
| <b>Instructional Focus on Learning</b><br><br>I-2 | CO                 | The teacher allocates maximum time towards instructional activities resulting in minimal interruptions; academic learning time is clearly the focus of instruction | The teacher reinforces his/her focus on instruction through appropriate allocation of time to the teaching and learning process.                  | The teacher allows non-instructional activities to reduce instructional time and curtail teaching objectives.                    | The teacher demonstrates little urgency in making use of instructional time and prolongs interruptions.                        |
| <b>Instructional Clarity</b><br><br>I-3           | CO                 | The teacher communicates effectively with individual students and classroom groups. Provides plentiful instructional examples and guided practice.                 | The teacher communicates the content with clarity and gives step-by-step directions. Provides some examples and practice.                         | The teacher does not consistently communicate with clarity or often does not provide adequate directions, examples, or practice. | The teacher provides confusing directions, examples, or practice. The teacher does not fully or clearly explain concepts.      |

| <u>Title and #</u>                                         | <u>Data Source</u> | <u>Level 4</u>                                                                                                                                                                                                                                                                                                      | <u>Level 3</u>                                                                                   | <u>Level 2</u>                                                                                                                                                                                                                 | <u>Level 1</u>                                                                                                                                                                     |
|------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Instructional Complexity</b><br><br><b>I-4</b>          | CO                 | Learning activities require complex thinking as a major focus or extension of the lesson(e.g., students may be asked to analyze cause and effect, identify a problem and pose reasonable solutions, speculate giving details or justification, defend options or argue a position with evidence to a great extent). | Some activities require complex thinking as a secondary focus of the lesson.                     | Learning activities primarily involve students in tasks that require rote memory or only limited amounts of complex thinking. (e.g., students may be asked to summarize straightforward information, infer simple main ideas). | Learning activities involve students in tasks that do not require any significant degree of complex thinking. Students may be asked to recall basic information.                   |
| <b>Expectations For Student Learning</b><br><br><b>I-5</b> | CO                 | The teacher consistently encourages maximum effort from students and provides the encouragement to promote it; stresses student responsibility.                                                                                                                                                                     | The teacher encourages consistent effort from students and provides encouragement to promote it. | The teacher sets uneven (different) expectations for students without a clear rationale for the differentiation; does not adequately empower students to assume responsibility for learning.                                   | The teacher sets low expectations for most or all students; is not surprised with low performance and demonstrates practice that students are not capable of independent learning. |

## Teacher Effectiveness Behavior Scale

### Area A: Assessment Skills

Effective teachers use a variety of assessment practices to monitor student learning, including formal and informal assessments and formative and summative assessments. Assessments are used to monitor progress, provide feedback to students and parents, and to adjust instruction. When necessary, effective teachers re-teach material that has not been learned thoroughly.

| <u>Title and #</u>                                   | <u>Data Source</u> | <u>Level 4</u>                                                                                                                                                                                                                                                                                                                                                                                          | <u>Level 3</u>                                                                                                                                                                                                                                                                                      | <u>Level 2</u>                                                                                                                                                                                                                                                                                                                                              | <u>Level 1</u>                                                                                                                                                                                                                                                               |
|------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Assessment for Understanding</b><br>A-1           | CO                 | The teacher regularly checks in with students to monitor their level of understanding, interest, frustration, etc. Student understanding is assessed through a variety of methods (observation, group questioning, individual conversations, looking at student work, etc.). The teacher remains flexible in instructional decision-making and seems to continuously use "data" to adjust instruction.. | The teacher checks in with students periodically, particularly at the end of the lesson to gauge their understanding of content. The methods and extent of checks for understanding are sufficient to identify and address serious misunderstandings but the probing is not detailed and extensive. | The teacher may check for understanding once or twice during a lesson by asking for any questions but does very little probing or acting on the information and makes few adjustments to respond to any confusion students express. The teacher sees to either miss student cues that indicate lack of understanding or recognize them but not act on them. | The teacher seldom or never checks for understanding and seems to teach the lesson as planned with little flexibility for responding to misunderstandings. The teacher does not use observation or questioning or other assessment methods to monitor student understanding. |
| <b>Quality of Verbal Feedback to Students</b><br>A-2 | CO                 | The teacher provides <i>verbal</i> feedback consistently, addresses individual student strength and weaknesses, and encourages student self-reflection. Feedback is fair and demonstrates high expectations for all students.                                                                                                                                                                           | The teacher provides <i>verbal</i> feedback that is appropriate and consistently addresses individual student strengths and weaknesses. Feedback provides good idea of how students can improve.                                                                                                    | The teacher provides minimal <i>verbal</i> feedback on student performance. Feedback does not adequately address individual student strengths or weaknesses. Re-direction is inconsistent or limited.                                                                                                                                                       | The teacher provides <i>verbal</i> feedback that is limited to correctness of response. There is little or no direction provided for improvement in performance.                                                                                                             |

## Teachers' Sense of Efficacy Scale<sup>1</sup> (long form)

| Teacher Beliefs                                                                                                                                                                                                                                                            | How much can you do? |             |     |     |                |     |             |     |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------|-----|-----|----------------|-----|-------------|-----|--------------|
| Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below. Your answers are confidential. | Nothing              | Very Little |     |     | Some Influence |     | Quite A Bit |     | A Great Deal |
| 1. How much can you do to get through to the most difficult students?                                                                                                                                                                                                      | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 2. How much can you do to help your students think critically?                                                                                                                                                                                                             | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 3. How much can you do to control disruptive behavior in the classroom?                                                                                                                                                                                                    | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 4. How much can you do to motivate students who show low interest in school work?                                                                                                                                                                                          | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 5. To what extent can you make your expectations clear about student behavior?                                                                                                                                                                                             | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 6. How much can you do to get students to believe they can do well in school work?                                                                                                                                                                                         | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 7. How well can you respond to difficult questions from your students?                                                                                                                                                                                                     | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 8. How well can you establish routines to keep activities running smoothly?                                                                                                                                                                                                | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 9. How much can you do to help your students value learning?                                                                                                                                                                                                               | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 10. How much can you gauge student comprehension of what you have taught?                                                                                                                                                                                                  | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 11. To what extent can you craft good questions for your students?                                                                                                                                                                                                         | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 12. How much can you do to foster student creativity?                                                                                                                                                                                                                      | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 13. How much can you do to get children to follow classroom rules?                                                                                                                                                                                                         | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 14. How much can you do to improve the understanding of a student who is failing?                                                                                                                                                                                          | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 15. How much can you do to calm a student who is disruptive or noisy?                                                                                                                                                                                                      | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 16. How well can you establish a classroom management system with each group of students?                                                                                                                                                                                  | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 17. How much can you do to adjust your lessons to the proper level for individual students?                                                                                                                                                                                | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 18. How much can you use a variety of assessment strategies?                                                                                                                                                                                                               | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 19. How well can you keep a few problem students from ruining an entire lesson?                                                                                                                                                                                            | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 20. To what extent can you provide an alternative explanation or example when students are confused?                                                                                                                                                                       | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 21. How well can you respond to defiant students?                                                                                                                                                                                                                          | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 22. How much can you assist families in helping their children do well in school?                                                                                                                                                                                          | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 23. How well can you implement alternative strategies in your classroom?                                                                                                                                                                                                   | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |
| 24. How well can you provide appropriate challenges for very capable students?                                                                                                                                                                                             | (1)                  | (2)         | (3) | (4) | (5)            | (6) | (7)         | (8) | (9)          |

Developers: Megan Tschannen-Moran, College of William and Mary  
Anita Woolfolk Hoy, the Ohio State University.



## REFERENCES

References marked with an asterisk (\*) indicate studies included in a meta-analysis.

Adelman, C. (1999, June). *Answers in the toolbox: Academic intensity, attendance patterns, and bachelor's degree attainment*. (OERI Research Monograph). Jessup, MD: Education Publications Center.

Agne, K.J., (2001). Gifted: The lost minority. *Kappa Delta Pi Record*. 37(4), 168-172.

Amrein, A.L. & Berliner, D.C. (2002, March 28). High-stakes testing, uncertainty, and student learning. *Education Policy Analysis Archives*, 10(18). Retrieved March 28, 2003 from: <http://epaa.asu.edu/epaa/v10n18/>

Bandura, A. (1997). *Self-efficacy: The Exercise of Control*. New York: W. H. Freeman and Company.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist*. 28(2), 117-148.

Bain, H.P. & Jacobs, R. (1990, September). The Case for smaller classes and better teachers. *Streamlined Seminar-National Association of Elementary School Principals*, 9 (1).

Bechtel, T. & Waterson, M. (2003, January). Bridging teacher education and educational research: A requisite for 21st century education. *IB research notes*, 3(1), 2-3.

\*Bell, A.W., O'Brien, D. & Shiu, C. (1980). Designing teaching in the light of research on understanding. In *Proceedings of the Fourth International Conference for the Psychology of Mathematics Education*, R. Karplus, ed. ERIC Document Reproduction Service No. ED 250 186. Berkley, CA: The International Group for the Psychology of Mathematics.

- Berliner, D. C., & Rosenshine, B. V. (1977). The acquisition of knowledge in the classroom. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), *Schooling and the acquisition of knowledge* (pp. 375-396). New Jersey: Lawrence Erlbaum Associates.
- Bishop, J. (1998). *Do curriculum-based external exit exam systems enhance student achievement?* (CPRE Research Report Series RR-40). Pennsylvania: University of Pennsylvania, Consortium for Policy Research in Education.
- Blair, J. (2000). ETS study links effective teaching methods to test-score gains. Retrieved November 21, 2000 from the World Wide Web:  
<http://www.edweek.org/ew/ewstory.cfm?slug=08etsbox1h20>
- Bloom, B. S. (1984). The search for methods of group instruction as effective as one-to-one tutoring. *Educational Leadership*, 41(8), 4-17.
- Bloom, B.S. (Ed.) (1956) *Taxonomy of educational objectives: The classification of educational goals: Handbook I, cognitive domain*. New York ; Toronto: Longmans, Green.
- Borich, G.D. (2000). *Effective Teaching Methods, 4<sup>th</sup> ed*. Upper Saddle, NJ: Merrill.
- Bransford, J.D., Brown, A.L. & Cocking, R.R. (Eds.) (2000). *How People Learn: Brain, Mind, Experience, and School*. Washington, D.C.: National Academy Press.
- Brookhart, S. M., & Loadman, W. E. (1992). Teacher assessment and validity: What do we want to know? *Journal of Personnel Evaluation in Education*, 5, 347-357.
- Brown, J.L. & Moffett, C.A. (1999). *The hero's journey*. Alexandria, VA: ASCD.
- Callahan, C.M. (2001). Beyond the gifted stereotype. *Educational Leadership*, 59(3). 42-46.
- Carnine, D.W. (1993). Effective teaching for higher cognitive functioning. *Educational*

- Technology*, 33(10), 29-33.
- Carper, A. (2002). *Bright students in a wasteland: The at-risk gifted a qualitative study of fourteen gifted dropouts*. (Doctoral dissertation. North Carolina State University, 2002).
- Carson, E.W. (1990). *The IB Curriculum and Performance in College*. Research conducted for Virginia Polytechnic Institute and State University.
- Cawelti, G. (Ed.). (1999a). *Handbook of research on improving student achievement*. Arlington, Virginia: Educational Research Service.
- Cawelti, G. (1999b). *Portraits of six benchmark schools: Diverse approaches to improving student achievement*. Arlington, Virginia: Educational Research Service.
- Choudhury, P. (1994). International Baccalaureate. *Getting the Best Precollege Education, 1*. Hellerman, S.B. ed. Baltimore, MD: John Hopkins University Press.
- Cohen, R.M. (2002 March). Schools our teachers deserve: A proposal for teacher-centered reform. *Phi Delta Kappan* 83(7), 532-537.
- Coleman, J., Campbell, E., Hobson, C. McParland, J. Mood, A. Weinfield, F. & York, R. (1966). *Equality of Educational Opportunity*. Washington, DC: U.S. Office of Health, Education, and Welfare.
- The College Board. (1997). *Research Summary RS-02*. Retrieved December 2001 from: [www.collegeboard.org](http://www.collegeboard.org)
- The College Board & The IBO. (2002) *AP & IB*. Retrieved March 28, 2003 from: [www.ibo.org](http://www.ibo.org)
- Cotton, K. (1999). *Research You Can Use To Improve Results*. Portland, OR: Northwest Regional Educational Laboratory & Alexandria VA: Association for Supervision and Curriculum Development.

- Cotton, K. (2000) *The Schooling Practices That Matter Most*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Covino, E. A., & Iwanicki, E. F. (1996). Experienced teachers: Their constructs of effective teaching. *Journal of Personnel Evaluation in Education*, 10, 325-363.
- Creswell, J. W. (1998). *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*. Thousand Oaks, CA: Sage
- Cruickshank, D.R. Bainer, D.L. & Metcalf, K.K. (1999). *The Act of Teaching*, 2<sup>nd</sup> ed. Boston: McGraw-Hill.
- Darling-Hammond, L. (2000). Teacher quality and student achievement: A review of state policy evidence. *Educational Policy Analysis Archives*, 8 (1), Available online from <http://olam.ed.asu.edu/epaa/v8n1>
- Darling-Hammond, L., Berry, B., and Thoreson, A. (2001, spring). "Does Teacher Certification Matter? Evaluating the Evidence." *Educational Evaluation and Policy Analysis*, (22)1, 52-57.
- Dubner, F.S. (1979). Thirteen ways of looking at a gifted teacher. *Journal for the Education of the Gifted*, 3(3), 143-146.
- Duevel, L. (1999). *The International Baccalaureate Experience: University Perseverance, Attainment, and Perspectives on the Process*. Unpublished doctoral dissertation, Purdue University. West Lafayette, Indiana.
- Eisner, E. W. (2003, December) Preparing for today and tomorrow. *Educational Leadership*. 61 (4), 6-10.

- Emmer, E. T., Evertson, C. M., & Anderson, L. M. (1980). Effective classroom management at the beginning of the school year. *The Elementary School Journal*, 80, 219-231.
- Feldhusen, J., VanTassel-Baska, J. & Seeley, K. (1989). *Excellence in Educating the Gifted*. Denver: Love Publishing Co.
- Ferguson, P. & Womack, S.T. (1993). The impact of subject matter and education coursework on teaching performance. *Journal of Teacher Education*, 44 (1), 55-63.
- Fetler, M. (1999). *High School Staff Characteristics and Mathematics Test Results*. Retrieved December 5, 2000 from the World Wide Web: <http://epaa.asu.edu/epaa/v7n9.html>
- \*Garner, R. & Alexander, P. (1989). Metacognition: Answered and unanswered questions. *Educational Psychologist*, 24. 143-158.
- Garton, B. (2000). Recruitment of teachers for international education. In M. Hayden & J. Thompson (Eds.), *International Schools and International Education: Improving Teaching, Management, and Quality*. (pp. 85-95). London: Kogan Page Limited.
- Gehring, J. (2001 April 25). The International Baccalaureate: 'Cadillac' of college-prep programs. *Education Week*. 20 (32). p. 19.
- Gentry, Rizza, & Owen, (2002, spring) Examining perceptions of challenge and choice in classrooms: The relationship between teachers and their students and comparisons between gifted students and other students. *Gifted Child Quarterly*, 46(2), 145-154.
- Glasser, W. (1990). *The Quality School: Managing Students Without Coercion*. New York: Harper Perennial.
- Grant, B. (2002). Looking through the glasses: J. D. Salinger's wise children and gifted education. *Gifted Child Quarterly*, 46 (1), 6-14.

- Goldhaber, D.D. & Brewer, D.J. (2000, summer) "Does teacher certification matter? High school teacher certification status and student achievement." *Educational Evaluation and Policy Analysis*, 22 (2), 129-145.
- Gollub, J., Bertenthal, M., Labov, J., & Curtis, P. (Eds.). (2002). *Learning and Understanding: Improving Advanced Study of Mathematics and Science in U.S. High Schools*. Washington, D.C.: National Academy Press.
- Good, T. L., & Brophy, J. E. (1997). Increasing teacher awareness through observation, ch. 2. *Looking in Classrooms* (7<sup>th</sup> ed.). New York: Addison-Wesley.
- Gubbins, E.J. (2003, spring). NRC/GT looks at self-reflection of classroom practices. *NRCG/T Newsletter*, 1-8.
- Gubbins, E.J. (2002, spring). NRC/GT Query: Are programs and services for gifted and talented students responsive to beliefs? *NRCG/T Newsletter*, 1-8.
- Haensly, P. (2001). "Gifted Teacher: Facilitators of Becoming." *Roeper Review*, 23(4), 189-190.
- Hall, B.W. et.al. (1992, June). *Attributions That Teachers Hold to Account for Student Success and Failure and Their Relationship to Teaching Level and Teacher Efficacy Beliefs*. Paper presented at the Annual Meeting of the American Educational Research Association. San Francisco, CA.
- Hansford, S.J. (1985). What it takes to be a G/T teacher. *Gifted Children Monthly*, 6. 15-17.
- Hayden, M.C., Rancic, B.A., & Thompson, J.J. (2000, March) Being international: Student and teacher perceptions from international schools. *Oxford Review of Education*, 26 (1), 107-123.
- Heath, W.J. (1997, May). *What are the Most Effective Characteristics of Teachers of the Gifted?*

- (ERIC Document Reproduction Services ED411665).
- Henderson, J. (1996). Effective teaching in advanced placement classrooms. *Journal of Classroom Instruction*, 31(1), 29-35.
- Hiebert, J., Gallimore, R., & Stigler, J. W. (2002 Jun/Jul). A knowledge base for the teaching profession: What would it look like and how can we get one? *Educational Researcher*, 31(5) pp3-15
- IBO (2003a, May). *Annual Review 2002*, Cardiff, Wales: International Baccalaureate Organization.
- IBO. (2002a) *A Basis for Practice: The Diploma Programme*  
Geneva: Switzerland: International Baccalaureate Organization
- IBO, (2001, February). *Diploma Programme Biology: For First Examination in 2003*. Geneva, Switzerland: Organisation du Baccalaureat International.
- IBO. (2002b). *North American Statistical Bulletin, May 2002 Examination Session*. New York: International Baccalaureate Organization
- IBO (2003b). *Statistical Bulletin, May 2002*. Geneva, Switzerland: Organisation du Baccalaureat International.
- IBO. (2002c, March). *School's Guide to the Diploma Program*. Geneva, Switzerland: Organisation du Baccalaureat International.
- International Baccalaureate Organisation, (n.d.), *IBO Guidebook*. Geneva, Switzerland: IBO
- International Baccalaureate Research Unit & International Baccalaureate Curriculum & Assessment Centre. (2001, January). *IB Research Notes 1(1)*. 1-2.
- Jesse, A. (1999, November). The IB student at William and Mary. *Guidance Counselor's*

- Newsletter*. Retrieved August 11, 2003 from  
<http://www.aisb.ro/carpati/archive/nov99/wesson.htm>
- Johnson, B. L., Jr. (1997). An organizational analysis of multiple perspectives of effective teaching: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education, 11*, 69-87.
- Johnson, D. (2000). Teaching mathematics to gifted students in a mixed-ability classroom. *ERIC EC Digest #E594*. Retrieved February 22, 2003 from: <http://ericec.org/digests/e594.html>
- Johnsen, S.K., Haensley, P., Ryser, G., & Ford, R. (2002, Winter) Changing general education classroom practices to adapt for gifted students. *Gifted Child Quarterly, 46*(1), 45 – 63.
- Johnsen, S.K. & Ryser, G.R. (1996). An overview of effective practices with gifted students in general-education settings. *Journal for the Education of the Gifted, 19*(4), 379-405.
- Joyce, B., Weil, M., & Calhoun, E. (2000). *Models of Teaching, Sixth Edition*. Boston: Allyn and Bacon
- Kapusnick, R.A. & Hauslein, C.M. (2001, Summer). The “silver cup” of differentiated instruction. *Kappa Delta Pi Record, 37*(4), 156-159.
- Karnes, F.A., Stephens, K., & Whorten, J. (2000, April). Certification and specialized competencies for teachers in gifted education programs. *Roeper Review, 22*(3), 201-202.
- \*Kobayashi, Y. (1994). Conceptual acquisition and change through social interaction. *Human Development, 37*, 233-241.
- Kolb, B. (2002). *2002 IB Study*. A study presented at the University of Florida. Gainesville, Florida.
- Kolb, B. & Eckhardt, W.S. (1999). *1999 IB Study*. A study presented at the University of Florida.



Gainesville, Florida.

- Kulik, J.A. & Kulik, C.I.C. (1992). Meta-analytic findings on grouping programs. *Gifted Child Quarterly*, 6, 73-77.
- \*Lampert, M. (1986). Knowing, doing, and teaching multiplication, *Cognition and Instruction*. 3, 305-342.
- \*Lave, J. (1991). Situated learning in communities of practice. In L. Resnick, J. Levine, & S. Teasley (Eds.), *Perspectives on Socially Shared Cognition* (pp.63-83). Washington, DC: American Psychological Association.
- Lee-Corbin, H. & Denicolo, P. (1998, December). Portraits of the able child: Highlights of case study research. *High Ability Studies*, 9(2) pg. 207-219
- Lewis, H. (2003, May). Students and parents find the IB offers more than a textbook education. *IB World*, 35, 11
- Lord, M. (2002). America's best colleges 2001: Honors classes do help but beware of loading up inappropriately. *US News & World Report*. Retrieved May 3, 2002 from <http://www.usnews.com/usnews/edu/college/articles/coadvance.htm>
- Maker, J.C. & Nielson, A.B., (1996). *Curriculum Development and Teaching Strategies for Gifted Learners*, 2<sup>nd</sup> ed. Austin, Texas: Pro-ed.
- Marland, S.P. (1972). *Education of the Gifted and Talented*. Report to the Subcommittee on Education, Committee on Labor and Public Welfare, U.S. Senate. Washington DC: U.S. Government Printing Office.
- Marzano, R. J., Pickering, D., & McTighe, J. (1993). *Assessing Student Outcomes: Performance Assessment Using the Dimensions of Learning Model*. Alexandria, VA: Association for Supervision and Curriculum Development.

- Marzano, R. J., Pickering, D., & Pollard, J.E. (2000). *Classroom Instruction That Works*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Mathews, J. (2002a, August 7). Advanced Placement: Why college-level high school programs will retain their influence, despite current problems. *Education Week*. XXI (43). 51, 68.
- Mathews, J. (2002b, December 3). AP, IB tests in area schools soar above national average. *Washington Post*. Retrieved March 16, 2003 from:  
<http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&node+&contented=A3290-2002>
- Mathews, J. (2003a, June 2). The 100 best high schools in America. *Newsweek*. 49-54.
- Mathews, J. (2003b, July ). *The Perils of Challenge*. Speech presented at the IBO North American and Caribbean Annual Regional Conference, Niagara Falls, Ontario.
- McGhan, B. (2002 March). Schools our teachers deserve: A proposal for teacher-centered reform. *Phi Delta Kappan* 83(7), 538-540.
- McGonagill, B. K. (1996). The Virginia plan for the gifted: a guide for the development of effective program services for gifted students. *Governor's Schools and Gifted Education*. Retrieved August 12, 2003. from  
<http://www.pen.k12.va.us/VDOE/Instruction/Gifted/gftpln.html>
- \*McKenzie, M. (1998) Going, going, Gone ... Global! in: M.C. Hayden & J. Thompson (Eds) *International Education: Principles and Practice* (London, Kogan Page).
- Mendro, R. L. (1998). Student achievement and school and teacher accountability. *Journal of Personnel Evaluation in Education* (40), 41-58.
- Mulhern, J. & Ward, M. (1985). Achieving excellence through the International Baccalaureate

- program: A case study university-school district cooperation. *Roepers Review* (7), 226-227.
- Munro, J. (2002, April). The influence of student learning characteristics on progress through the Extended Essay. *Journal of Research on International Education*, 2 (1), p. 5-24.
- National Association of Secondary School Principals. (1997). Students say: What makes a good teacher? *Schools in the Middle*, 6 (5), 15-17.
- National Board for Professional Teaching Standards. (no date). *What Teachers Should Know and Be Able to Do*. Retrieved September 4, 1999 from the World Wide Web:  
<http://www.nbpts.org/nbpts/standards>
- National Commission of Excellence in Education. (1983). *A nation at Risk: The Imperative for Education Reform*. Washington, D. C.: U.S. Department of Education.
- National Research Council. (2000). *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy Press.
- Newmann, F. M. & Wehlage, G. G. (1995). *Successful School Restructuring: A Report to the Public and Educators by the Center on Organization and Restructuring of Schools*. Madison, WI: University of Wisconsin-Madison, School of Education, Wisconsin Center for Education Research, Center on Organization and Restructuring of Schools.
- Nikakis, S. (2002). What makes an expert teacher of the gifted? *Learning Matters*, 7(1), 42-44.
- Nugent, S. A. & Karnes, F. A. (2002, winter). The advanced placement program and the international baccalaureate programme: A history and update. *Gifted Child Today*, 25(1), 30-39.
- Paige, R. (2002, November 20). *Remarks by the U.S. Secretary of Education Rod Paige Before*

- the States Institute on International Education in the Schools*. Retrieved July 23, 2003 from <http://www.ed.gov/Speeches/11-2002/11202002.html>
- Peart, N. A., & Campbell, F. A. (1999). At-risk students' perceptions of teacher effectiveness. *Journal for a Just and Caring Education*, 5, 269-284.
- Phillips, J. (2002, December). The third way: Lessons from international education. *Journal of Research in International Education*, 1(2), 159-181.
- Powell, W. (2000). Professional development and reflective practice. In M. Hayden & J. Thompson (Eds.), *International Schools and International Education: Improving Teaching, Management, and Quality*. (pp. 85-95). London: Kogan Page Limited.
- Rash, P.K. & Miller, A.D. (2000, April). A survey of the practices of teachers of the gifted. *Roeper Review*, 22(3), 192-194.
- Reagan, T.G., Case, C.W., & Brubacher, J.W. (2000). *Becoming a Reflective Educator: How to Build a Culture of Inquiry in the Schools*. 2<sup>nd</sup> ed. Thousand Oaks, CA: Corwin Press.
- Reiss, S.M., Gentry, M, & Park, S. (1996 Winter). Extending the pedagogy of gifted education to all students. *The National Research Center on the Gifted and Talented Newsletter*. Retrieved April 26, 2002 from <http://www.sp.uconn.edu/~nrcgt/news/winter96/wintr965.html>
- Renzulli, J. S. (1986). The three-ring conception of giftedness: A developmental model for creative productivity. In Sternberg, R. J., & Davidson J. (Ed.) *Conceptions of Giftedness* (pp. 53-92). New York: Cambridge University Press.
- Renzulli, J. S. (1999). What is this thing called giftedness, and how do we develop it? A twenty-five year perspective. *Journal for the Education of the Gifted*. 23(1), 3-54.
- Renzulli, J. S. & Reis, S. M. (1985). *The Schoolwide Enrichment model: A How-to Guide for*

- Educational Excellence*. Mansfield Center, CT: Creative Learning Press.
- Ross, J. A. (1998). The antecedents and consequences of teacher efficacy. In J. Brophy (Ed.) *Advances in Research on Teaching*. Vol. 7 (pp. 49-74). Greenwich, CT: JAI Press.
- Ross, J. A. (1994a, June). *Beliefs That Make a Difference: The Origins and Impacts of Teacher Efficacy*. Paper presented at the Annual Meeting of the Canadian Association for Curriculum Studies. Calgary, Alberta, Canada.
- Ross, J. A. (1994b). The impact of an in-service to promote cooperative learning on the stability of teacher efficacy. *Teaching and Teacher Education*, 10 (4), 381-394.
- Ross, J.A. (1998). Strategies for enhancing teachers' beliefs in their effectiveness: Research on a school improvement hypothesis. *Teachers College Record*, 97(2), 227-251.
- Ross, J.A., Cousins, J.B. & Gadalla, T (1996). Within teacher predictors of teacher efficacy. *Teaching and Teacher Education*, 12 (4), 385-400.
- Rothman, R. (2002, summer). A test worth teaching to. *American Educator*, 28-36.
- Rowan, B., Chiang, F.S., & Miller, R.J. (1997). Using research on employees' performance to study the effects of teachers on student achievement. *Sociology of Education*, 70, 256-284.
- Rubin, L.J. (1985). *Artistry in Teaching*. New York: Random House.
- Sanders, W.L. & Rivers, J.C. (1996, November) *Cumulative and Residual Effects of Teachers on Future Student Academic Achievement*. Knoxville, Tennessee: University of Tennessee Value-Added Assessment Center. (R11-0435-02-001-97). Retrieved March 2001 from [www.heartland.org/apps/documents/docsPubResults2.cfm](http://www.heartland.org/apps/documents/docsPubResults2.cfm)
- Scaturro, S. & Campbell, P. (2003). *An Analytical Look at the North American Region* Research presented at the IBNA Annual Regional Conference, Niagara Falls,

Ontario.

Seeley, K.R. (1979). Competencies for teachers of gifted and talented children. *Journal for the Education of the Gifted*, 3 (1), 7-13.

Silverman, L. (1995, Nov./Dec./Jan). How are gifted teachers different from other teachers? (Abstract) *The Kaleidoscope* (1) p. 8- 9.

Silverman, L. (1990). *Secondary Programs for Gifted Students*. Ordered online on March 23, 2003 from:  
<http://www.gifteddevelopment.com/Merchant2/url.mv?M=47&S=GDCC&O=2187&X=1048441513>

Smith, A.F. & Czarra, F. R. (2003). Teaching in a global context. *ASCD Infobrief*, 1(32), 1-10.

Smutney, J.F. (2000). Teaching young gifted children in the regular classroom. *ERIC EC Digest* #595. Retrieved October 17, 2001 from

Speed, F. & Appleyard, D. (1985) *The Bright and the Gifted*. Toronto: Guidance Centre.

Stake, R. (1994). Case studies. in Denzin, N. and Lincoln, Y. (Eds). *Handbook of Qualitative Research*. Thousand Oak, Sage. 236-248.

Standards Work, Inc. (2003). *Study of the Effectiveness of the Virginia Standards of Learning (SOL) Reforms*. Retrieved August 1, 2003 from  
<http://www.pen.k12.va.us/VDOE/Instruction/VASOLstudy.pdf>

Stepanek, J. (1999, December). *The Inclusive Classroom: Meeting the Needs of Gifted Students: Differentiating Mathematics and Science Instruction. It's Just Good Teaching Series*. Retrieved February 16, 2003 from:  
[http://www.nwrel.org/msec/just\\_good/9/gifted.pdf](http://www.nwrel.org/msec/just_good/9/gifted.pdf)

Sternberg, R. J. (2003, November). What is an "expert student?" *Educational Researcher*. 32 (8),

5-9.

Sternberg, R.J. & Grigorenko, E.L. (2002, Fall), The Theory of successful intelligence as a basis for gifted education. *Gifted Child Quarterly*, 46(4), 265-277.

Stronge, J.H. (2002). *Qualities of effective teachers*. Alexandria, Virginia: Association for Supervision & Curriculum Development.

Stronge, J.H., Tucker, P.D. & Ward, T.J. (2003) *Teacher Effectiveness and Student Learning: What Do Good Teachers Do?* Paper presented at the 2003 American Educational Research Association Annual Conference. Chicago, IL.

Study shows students performing better since SOL's implemented. (2003, February 27). *Daily Press*, Retrieved March 1, 2003 from: <http://www.dailypress.com/news/local/virginia/dp-va--solstudy0227feb27.story>

Thomas, J. A., & Montgomery, P. (1998). On becoming a good teacher: Reflective practice with regard to children's voices. *Journal of Teacher Education*, 49, 372-380.

Torrance, P.E. & Goff, K. (1990). Fostering academic creativity in gifted students. *ERIC EC Digest 484*. Retrieved March 29, 2001 from: <http://ericec.org/digests/e484.htm>

Tschannen-Moran, M. & Hoy, A.W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*. 17, 783-805.

Tschannen-Moran, M. & Hoy, A.W. (2002, April). The influences of resources and support on teacher efficacy beliefs. A paper presented at the annual meeting of the American Educational Research Association. *What Is the Value of Understanding Beliefs? An Exploration of Beliefs Related to Academic Achievement*. New Orleans, LA.

Tschannen-Moran, M. Hoy, A.W. & Hoy, W.K. (1998). Teacher efficacy: its meaning and measure. *Review of Educational Research*. 68( 2), 202-248.

- Thompson, J. (1999). Student learning: A focus for research. *IB World*, 8.
- U.S. Department of Education. (2001). *No Child Left Behind Act of 2001*. Retrieved March 2002 from <http://www.ed.gov/offices/OESE/osea/index.html>
- VanTassel-Baska, J. (1993 July/August). *Linking Curriculum Development for the Gifted to School Reform and Restructuring*. *GCT*. p.34-37.
- VanTassel-Baska, J., Johnson, D., & Avery, L. (2002, Spring). Using performance tasks in the identification of economically disadvantaged and minority gifted learners: Findings from Project STAR. *Gifted Child Quarterly*, 46(2), 110-123.
- VanTassel-Baska, J. & Little, C.A. (2003). *Content-Based Curriculum for High-Ability Learners*. Washington, DC: Prufrock Press.
- VanTassel-Baska, J.L. & Olszewski-Kubilius, P. ed. (1989). *Patterns of Influence on Gifted Learners*. New York: Teachers College Press.
- VanTassel-Baska, J., Zuo, L., Avery, L., & Little, C. (2002, winter) Curriculum study of gifted-student learning in the language arts. *Gifted Child Quarterly*, 46(1), 30-44.
- Virginia Board of Education (2003). *Standards of Learning Currently in Effect for Virginia Public Schools: Forward*. Retrieved March 30, 2003 from:  
<http://www.pen.k12.va.us/VDOE/Superintendent/Sols/home.shtml>
- Virginia Department of Education. (2003). *Standards of Quality*. Richmond, VA.
- Vygotsky, L.S. (1978). *Mind in Society*. Cambridge, MA: Harvard University Press.
- Walker, G. (2002, November 27). International education: An idea whose time has come. *Education Week*, 22(13), 28 & 30.
- Walker, G. & Bollington, A. (2003, July). *Four months with McKinsey & Company: Planning the future*. Speech presented at the IBNA Annual Regional Conference, Niagara Falls,



Ontario.

- Wallace, E. (2002, 28 February). *IBO Welcomes Study*. Retrieved on April 29, 2002 from: [www.ibo.org/ibo/index.cfm?ObjectID=000EE1CA-9F06-1BBC1](http://www.ibo.org/ibo/index.cfm?ObjectID=000EE1CA-9F06-1BBC1)
- Wang, M. C., Haertel, G. D., & Walberg, H. J. (1993a). Toward a knowledge base of school learning. *Review of Educational Research*, 73, 249-294.
- Wang, M. C., Haertel, G. D., & Walberg, H. J. (1993b). What helps students learn? *Educational Leadership*, 51 (4), 74-79
- Wenglinsky, H. (2002, February 13). How schools matter: The link between teacher classroom practices and student academic performance. *Education Policy Analysis Archives*, 10(12). Retrieved March 26, 2002 from <http://epaa.asu.edu/epaa/v10n12/>.
- Wenglinsky, H. (2001, September). *Teacher Classroom Practices and Student Performance: How Schools Can Make a Difference*. (Research Report RR-01-19). Princeton, NJ: Educational Testing Service
- Wenglinsky, H. (2000). *How Teaching Matters: Bringing the Classroom Back into Discussions of Teacher Quality*. Princeton, NJ: Millikin Family Foundation and Educational Testing Service.
- Westberg, K., & Archambeault, F. (1997, winter). A multi-site case study of successful classroom practices for high ability students. *Gifted Child Quarterly*, 41(1), 42-51.
- Westberg, K., Archambeault, F., Dobyms, S., & Salvin, T. (1993, July). An observational study of instructional and curricular practices used with gifted and talented students in regular classrooms. *The National Research Center on the Gifted and Talented Research Monograph*, 93104.
- Wharburton, E. C., Bugarin, R., & Nunez, A. (2001, May). *Bridging the Gap: Academic*

*Preparation and Postsecondary Success of First-Generation Students.* (NCES

Publication Number 2001153). Washington, D.C.: U.S. Government Printing Office.

\*White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297-333.

Yin, R. K. (1995) *Case Study Research Design and Methods*, 2<sup>nd</sup> ed.. Thousand Oaks, Sage.

## VITA

Linda Prince Hutchinson

Birthplace: Cleveland, Ohio

Birthdate: April 10, 1946

## Education:

- |           |                                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------------|
| 1998-2004 | College of William and Mary<br>Williamsburg, Virginia<br>Ed.D in Educational Policy, Planning and Leadership |
| 1976-1978 | Old Dominion University<br>Norfolk, Virginia<br>M.S. in Administration/Supervision                           |
| 1964-1968 | Indiana University of Pennsylvania<br>Indiana, Pennsylvania<br>B.S. in Education English and Reading         |