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The Impact of an International Baccalaureate Primary Years Curriculum on Intermediate Grade Girls' and Boys' Perceptions of their Learned Global Citizenship Attributes

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The Impact of an International Baccalaureate Primary Years Curriculum on Intermediate Grade Girls' and Boys' Perceptions of their Learned Global Citizenship Attributes

By

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ABSTRACT

THE IMPACT OF AN INTERNATIONAL BACCALAUREATE PRIMARY YEARS CURRICULUM ON INTERMEDIATE GRADE GIRLS' AND BOYS' PERCEPTIONS OF THEIR LEARNED GLOBAL CITIZENSHIP ATTRIBUTES

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In this study girls (n = 30) reported a statistically significantly greater capacity for caring compared to boys (n = 30) on the caring domain of the International Baccalaureate Primary Years Program Student Self Assessment Learner Profile. However, the null hypothesis was not rejected for boys' and girls' reported levels of risk-taking behavior running counter to literature suggesting that boys are *ipso facto* bigger risk-takers than girls. However, in this study a greater advantaged classroom performance was not consistent with the research literature positing a stronger classroom performance in language arts (reading and writing) for girls compared to boys or a greater advantaged classroom performance in science and math for boys compared to girls. Overall, statistical equipoise was observed for all academic comparisons including reading, language, math, science, and social studies teacher ratings of classroom performance. It is

recommended that further research compare boys and girls as they mature and participate in the International Baccalaureate Middle Years and high school International Baccalaureate Diploma Programs to determine overall preparedness for post-secondary studies. International Baccalaureate programs must increasingly include racially and economically diverse students.

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TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

TABLE OF CONTENTS (cont.)

TABLE OF CONTENTS (cont.)

LIST OF TABLES

LIST OF TABLES (cont.)

LIST OF TABLES (cont.)

LIST OF TABLES (cont.)

CHAPTER ONE

Introduction

Currently there is a strong demand for internationally focused educational programs to meet the demands of globalization and the competition for global knowledge and business expertise--the world of tomorrow that today's elementary students are preparing for (Bales, 2004; Engler & Hunt, 2004; Friedman, 2005). In order to meet the goal of preparing today's students to successfully participate in global futures the International Baccalaureate Primary Years Programme (IBPYP) has set forth a framework for schools to incorporate (International Baccalaureate Organization, 2002) that emphasizes the importance of educating the whole child (Benninga, Berkowitz, Kuehn & Smith, 2006; International Baccalaureate, 2002). Moreover, the IBPYP is conceptualized as school wide, rather than an exclusive initiative meant only for a few gifted or academically talented students (International Baccalaureate Organization, 2002).

The IBPYP school curriculum emphasizes academics infused with attributes considered essential for participation in a global world (International Baccalaureate, 2002) and requires students to learn and demonstrate attributes such as being (a) inquirers, (b)

thinkers, (c) communicators, (d) risk-takers, (e) knowledgeable, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective throughout their school day. However, whether elementary age girls and boys are equally ready to learn and demonstrate highly sophisticated skills associated with being internationally minded learners and global citizens, as defined by the International Baccalaureate Organization (IBO, 2002), must be objectively assessed.

Gender Difference

While girls and boys alike are expected to learn and demonstrate global citizenship skills, in IBPYP schools, gender difference research has not been taken into consideration in this desire for outcome equipoise. There is research that documents gender differences in reading/language arts (Allred, 2001; Andre, Hendrickson & Chambers, 1997; Davies & Brember, 1999; Pajares & Giovanni, 2001), science (Catsambis, 1995; Dimitrov, 1999; Kahle, Parker, Rennie & Riley, 1993; Manning, 1998; Weinburgh, 1995), mathematics (Davies & Brember, 1999; Dimitrov, 1999; Lummis, 1990; Manning, 1998; Stroud, 1942), and life skills (Sax, 2005).

Reading. The research is not consistent with regards to the degree of difference in reading achievement for boys

and girls. There are studies that suggest differences occur to a degree as girls and boys progress in age (Lutkus, Rampey & Donahue, 2006). In The Nation's Report Card, the conclusion drawn is that girls in grades 4 and 8 score higher than boys in reading.

Writing. Pajares and Giovanni (2001) report that girls have higher self-efficacy in writing and thus they achieve at higher rates than boys in writing (Pajares & Giovanni, 2001). Writing is associated with femininity, according to the researchers, so girls relate to writing on a more personal level than boys do (Pajares & Giovanni, 2001).

Science. In the Nation's Report Card (Lutkus, Rampey & Donahue, 2006) the reported statistics give evidence that in fourth grade there is no gender difference in science achievement, however there is a difference in eighth grade and twelfth grade with males scoring higher than females.

Math. Davies and Brember (1999) found that boys perform better in the classroom and have higher mathematics test scores that seem to correspond with higher reported math self-esteem scores. Furthermore, Lummis (1990) found that while girls do as well as boys in mathematical computation boys out perform girls on word problems.

Life Skills. Girls are often found in research studies to be more self-disciplined than boys, thus they get better

grades in school even when achievement tests show that boys may have developed greater skills (Duckworth, 2006). Boys are also found to be more competitive and girls are more cooperative (Engelhard & Monsas, 1989). It is thought that the competitive nature of boys gives them an edge in achievement and success (Engelhard & Monsas, 1989).

Purpose of the Study

While the IBPYP has been implemented in the elementary school involved in the study, no research to date has been conducted locally or nationally to determine the impact of the IBPYP attitudes on 4th-grade and 5th-grade girls' and boys' perceptions of their learned global attributes, their achievement, and their life skills and how these differ with regard to gender. This research may contribute to the discussion of the efficacy of the IBPYP and contribute to discussion of its implementation district wide in the research school district.

The purpose of this study was to determine the impact of a founding yearlong school wide International Baccalaureate Primary Years Programme (IBPYP) curriculum on intermediate grade level girls' perceptions of their learned global citizenship attributes compared to intermediate grade level boys' perceptions of their learned global citizenship attributes.

Importance of the Study

The IBPYP has been implemented in 400 schools throughout the world. To date the attitudes and learner profile of a global learner, identified by the IBO, is gender neutral with the silent expectation that girls and boys will be able to learn and model the attributes equally well, with the same understanding, not affected by gender. However, there is research that suggests that some of the identified attributes and profiles required of students participating in IBPYP may be more natural for boys than girls or more natural for girls than boys. This study hoped to gain understanding of gender differences in the student self-assessment learner profile global citizenship attributes, course grades, and life skills if they are observed.

Research Questions

The following research questions were used to analyze student perceptions of their IBPYP learner profile attributes.

Overarching Pretest-Posttest Learner Profile Research Question #1: Do intermediate grade level students who participate in the IBPYP lose, maintain, or improve their beginning of the year compared to ending of the year Student Self-Assessment Learner Profile (SSALP) scores

reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains?

Overarching Posttest-Posttest Learner Profile Research Question #2: Do intermediate grade level students who participate in the IBPYP have congruent or different ending of the year compared to ending of the year SSALP scores reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains?

Overarching Pretest-Posttest Achievement Research Question #3: Do intermediate grade level students who participate in the IBPYP lose, maintain, or improve their beginning of the year compared to ending of the year grades for achievement in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies?

Overarching Posttest-Posttest Achievement Research Question #4: Do intermediate grade level students who participate in the IBPYP have congruent or different ending of the year compared to ending of the year achievement levels as determined by grades in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies?

Overarching Pretest-Posttest Life Skills Research Question #5: Do intermediate grade level students who participate in the IBPYP lose, maintain, or improve their beginning of the year compared to ending of the year life skill grades in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Overarching Posttest-Posttest Life Skills Research Question #6: Do intermediate grade level students who participate in the IBPYP have congruent or different ending of the year compared to ending of the year achievement levels as determined by life skills ratings in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Assumptions

The design of this study had several strong features including (a) good IB intervention stability, (b) long-term IB curriculum use, and (c) IB staff training and experience. At the beginning of the 2006-2007 school year intermediate level students began a review of the IB

attributes by completing a student self-assessment learner profile (SSALP) that included the ten attributes most central to fostering global citizenship outcomes. These were: (a) inquirers, (b) thinkers, (c) communicators, (d) risk-takers, (e) knowledgeable, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, (j) reflective (IBO, 2002). Teachers received IB programme training prior to the beginning of the 2006-2007 school year. This training was completed over a three-day period during the 2005-2006 school year. Further training was continued and provided throughout the 2006-2007 and 2007-2008 school years.

Delimitations

The sample for this study was confined to one 4th-grade and one 5th-grade class at one elementary school during the fall of 2006 and spring of 2007.

Limitations

Some limitations are important to note. First, the effectiveness of IB intervention cannot be separated from regular curriculum constraints. Second, there was a small *n* with only a total of 60 students who participated in the study. The Midwestern research school had little racial diversity.

Definition of Terms

Attitudes. Attitudes is defined as a set of attitudes that include tolerance, respect, integrity, independence, enthusiasm, empathy, curiosity, creativity, cooperation, confidence, commitment, and appreciation (IBO, 2002).

Caring. Caring is defined as showing sensitivity towards the needs and feelings of others; possessing a sense of personal commitment to action and service (IB), 2002).

Communicator. Communicator is defined as one who receives and expresses ideas and information confidently in more than one language, including the language of mathematical symbols (IBO, 2002).

Emotional Intelligence. Emotional intelligence is defined as the ability to rein in emotional impulse; to read another's innermost feelings; to handle relationships smoothly (Goleman, 1995). It is being able to motivate ones-self and persist in the face of frustrations; to control impulse and delay gratification; to regulate one's moods and keep distress from swamping the ability to think; to empathize and to hope (Goleman, 1995).

Intermediate grades. Intermediate grades are defined as elementary school students in grades four and five.

International Baccalaureate Learner Profile (IBLP). The IBLP includes the attributes the IBO has identified as being desirable in attempting to develop internationally minded people who are guardians of the planet and seek to create a better and more peaceful world (IBO, 2006). The IBLP includes the following characteristics: inquirer, knowledgeable, thinker, communicator, principled, open-minded, caring, risk-taker, balanced, and reflective.

International Baccalaureate Organization (IBO). International Baccalaureate Organization is defined as a non-profit educational foundation based in Geneva, Switzerland.

International Baccalaureate Primary Years Programme (IBPYP). The International Baccalaureate Organization began as a way to allow students in international schools to qualify for universities throughout the world. The first programme developed was the Diploma Programme, for grades eleven and twelve in 1968. By 1992 there was a recognized need for programmes in earlier grades to prepare students for the Diploma Programme. The International Baccalaureate Middle Years Programme (IBMYP) began in 1996 as a response to this need. In 1997 IBO developed the Primary Years Programme (PYP) for children aged three through twelve (IBO, 2002).

Inquirer. Inquirer is defined as a student whose natural curiosity has been nurtured; they have acquired the skills necessary to conduct purposeful, constructive research; they enjoy learning, and their love of learning will be sustained throughout their lives (IBO, 2002).

Knowledgeable. Knowledgeable is defined as one who has spent time in IB schools exploring themes which have global relevance and importance; in doing so, they have acquired a critical mass of significant knowledge (IBO, 2002).

Life skills. Life skills is defined as a set of skills identified by the Millard Public Schools that are considered essential for helping students to be ready for work, for life-long learning, and for citizenship. These skills include: cooperates with others to complete a task or goal, is trustworthy and honest, has a positive attitude, respects individual differences, respects the rights of others, and uses kind words and actions.

Open-minded. Open-minded is defined as respecting the views, values, and traditions of other individuals and cultures, and being accustomed to seeking and considering a range of points of view (IBO, 2002).

Primary Years Programme (PYP). Primary Years Programme is defined as an international transdisciplinary programme designed for students between the ages of 3 and 12 years.

Its goal is to foster the development of the whole child, (IBO, 2002).

Principled. Principled is defined as having a sound grasp of the principles of moral reasoning. They have integrity, honesty, and a sense of fairness and justice (IBO, 2002).

Profile. Profile is defined as desired attributes and traits that characterize students with an international perspective including: inquirers, thinkers, communicators, risk-takers, knowledgeable, principled, caring, open-minded, well-balanced, and reflective (IBO, 2002).

Reflective. Reflective is defined as giving thoughtful consideration to one's own learning and analyzing their personal strengths and weaknesses in a constructive manner (IBO, 2002).

Report card. Report card is defined as a report generated quarterly by teachers which reflects the progress students have made in the subject areas of reading, writing, spelling, mathematics, science/health, social studies, art, life skills, music, physical education, and Spanish.

Risk-taker. Risk-taker is defined as one who approaches unfamiliar situations without anxiety and has the confidence and independence of spirit to explore new

roles, ideas and strategies. Risk-takers are courageous and articulate in defending those things in which they believe (IBO, 2002).

Thinker. Thinker is defined as one who exercises initiative in applying thinking skills critically and creatively to make sound decisions and to solve complex problems (IBO, 2002).

Well-balanced. Well-balanced is defined as understanding the importance of physical and mental balance and well-being (IBO, 2002).

Significance of the Study

This study had the potential to contribute to research, practice, and policy. It was of significant interest to IB teachers, elementary school principals, district administrators and the IBO.

Contribution to research. Few studies, if any, have offered conclusions about the IB attitudes and the impact they have on girls compared to boys. This study examined the direct effects of the IB programme. The results of the study may inform the theoretical literature on the effectiveness of using the strategies that comprise the IBPYP curriculum.

Contribution to practice. Because implementation of the IBPYP curriculum makes no distinction between girls and

boys ability to learn and model the 10 attributes, a research study that examines gender outcome differences or similarities may lead to improved understanding of when and how to effectively teach boys and girls while understanding and appreciating differential outcomes.

Contribution to policy. Local level policy may be impacted through this study. If the results show a positive impact on student achievement and their life skills, a discussion should be generated to consider district-wide implementation. The questions asked might include the reasonableness of implementing only the attitudes and profile components of the IBPYP without implementation of the programme in its entirety.

Organization of the Study

The literature review relevant to this study is presented in Chapter 2. Chapter 3 describes the research design, methodology, and procedures that were used to gather and analyze the data of this study. Chapter 4 reports the research results, and Chapter 5 provides conclusions and a discussion of the research findings.

CHAPTER TWO

Review of the Literature

More than anything, we want children, girls and boys alike, to become successful participants in the world they are growing into--and it is thought that the world of tomorrow means global citizenship (Bales, 2004; Engler & Hunt, 2004; Friedman, 2005). Development of the IBPYP attributes is considered equally important for girls and boys who are expected to learn and demonstrate global citizenship skills. While the IBO has established over 400 primary years programme schools worldwide no gender difference research findings were cited in their literature of suggested attributes assuming outcome equivalence for girls and boys.

Literature on Gender Differences in Achievement and Life Skills

Researchers have asserted that gender is a factor in achievement (Allred, 2001; Davies & Brember, 1999; Dimitrov, 1999; Manning, 1998; Pajares & Giovanni, 2001) and in life skills (Duckworth & Seligman, 2006; Engelhard, 1989; George, Halpin, Dagnese & Keiter, 1997; Ramos, 1996; Seng, Siange & Wei, 1998; Stephens, Karnes & Whorton, 2001; Strough, Berg & Meegan, 2001). There is also research that documents gender differences in reading/language arts

(Allred, 2001; Andre, Hendrickson & Chambers, 1997; Davies & Brember, 1999; Pajares & Giovanni, 2001), science (Catsambis, 1995; Dimitrov, 1999; Kahle, Parker, Rennie & Riley, 1993; Manning, 1998; Weinburgh, 1995;), mathematics (Davies & Brember, 1999; Dimitrov, 1999; Lummis, 1990; Manning, 1998), and technology (Agosto, 2003; Comber, Colley, Hargreaves & Dorn, 1997; Shaw & Gant, 2002).

Reading and Writing. Reading and writing studies suggest differences in skill development occur to a degree as girls and boys progress in grade and age (Lutkus, Rampey & Donahue, 2006). For example, in The Nation's Report Card (2001) girls in grades 4 and 8 scored higher than boys on norm-referenced reading achievement tests. While girls achieve at higher levels than boys on reading tests in elementary school in the United States, in Germany, Nigeria, and England boys measured reading achievement is greater than girls (Allred, 2001). Higher reading grades for girls' have been attributed to the observation that girls seem to like reading better than boys and in turn girls perceive themselves as having higher competence than boys in classroom reading (Andre, Hendrickson & Chambers, 1997). However, according to Davies and Brember (1999) boys score higher on reading standardized tests and they self-report a higher self-concept in relation to reading on

these standardized measures than do girls. Pajares and Giovanni (2001) report that girls have higher reported self-efficacy scores in writing and they also achieve at higher rates than boys in writing (Pajares & Giovanni, 2001). Pajares & Giovanni (2001) also assert that writing is associated with femininity, so girls, in their studies, relate to writing on a more personal level than boys seem to.

Science. Many researchers posit that science achievement differences exist with respect to gender (Catsambis, 1995; Dimitrov, 1999; Kahle, Parker, Rennie & Riley, 1993; Manning, 1998; Weinburgh, 1995;). There are suppositions about the reasons for the differences. One school of thought is that the gender effect is associated with teacher expectations for girls and boys--lower for girls and higher for boys (Kahle, Parker, Rennie & Riley, 1993).

In separate studies Weinburgh (1995) and Catsambis (1995) arrived at the same conclusion that boys have a more positive attitude toward science than girls even though both researchers found that in the eighth grade females do not lag behind males in their science skills. In her study Catsambis (1995) found that girls' participate in fewer extracurricular science activities than boys and they

aspire less often to science careers addressing at least in part the locus of girls less than positive attitudes about science. Furthermore, twice as many males as females reported science career aspirations. This study also found that gender differences increase as students get older (Catsambis, 1995). In the Nation's Report Card (Lutkus, Rampey & Donahue, 2006) reported statistics give evidence that in fourth grade there is no gender difference in science achievement, however there is a difference in eighth grade and twelfth grade with males scoring higher than females on high stakes norm-referenced achievement tests perhaps due to the differing levels of direct and incidental science learning that boys and girls engage in over the school years leading up to high school. In one study it was discovered that gender differences varied by ability levels for students where higher ability boys science scores were greater than measured science scores for higher ability girls. In this same study no differences were observed between boys and girls from medium or low ability groups (Dimitrov, 1999).

Mathematics and technology. While research supports the contention that there are gender differences in mathematics norm-referenced achievement scores for students in the fourth grade, this difference is not found in a

comparison of girls and boys eighth grade and twelfth grade test results (Manning, 1998). However, Davies and Brember (1999) found that boys perform better in the classroom and have higher mathematics grades that seem to correspond with higher reported math self-esteem scores. Furthermore, Lummis (1990) found that while girls do as well as boys in mathematical computation boys out perform girls on word problems.

Perhaps because boys tend to approach math problem solving as a game their greater use of math and technology for gaming and the Internet speaks to their confidence even though girls measured skills may be the same (Engelhard & Monsas, 1989). While boys approach technology use as a game, girls tend to use technology for email, chat rooms, and homework to foster and promote relationships (Shaw & Gant, 2002; Weiser, 2000). Furthermore, girls have been found to use technology less often than boys (Agosto, 2003; Comber, Colley, Hargreaves & Dorn, 1997; Kay, 2007). In contemporary terms computers have been considered to be masculine and have been termed “boy toys” (Agosto, 2003). Aggressive, violent, antisocial, and death oriented computer games are being directly marketed to boys (Hartigan, 1999). Perhaps because of their appeal to boys and repetitive play--sometimes hours at a time--boys have

more confidence in their technology skills and a more positive attitude toward computers than females at all school ages (Comber, Colley, Hargreaves & Dorn, 1997; Kay, 2007; Shaw & Gant, 2002). Over the last decade, computer gaming has become a major topic of research interest (Agosto, 2003; Comber, Colley, Hargreaves & Dorn, 1997; Shaw & Gant, 2002). Gender differences exist in individuals' preferences of computer games (Agosto, 2003; Shaw & Gant, 2002; Weiser, 2000). Girls tend to be less involved with video games and they prefer different types of games (Hartmann & Klimmt, 2006). The reason that girls are less involved is explained by the fact that girls prefer more social interaction than is found when playing computer games. Also, the violent content of computer games make them less attractive to girls. Almost all games involve competitive elements, such as sports contests, armed duels or car racing. Moreover, females portrayed themselves as less competitive and found winning less important than their male counterparts (Hartmann & Klimmt, 2006).

Finally, girls do not enjoy participating in computer games because females are portrayed as victims of direct male violence, who need protecting and rescuing by a hero male (Hartmann & Klimmt, 2006).

Life skills. Life skill development is thought to be dependent on gender differences (Sax, 2005). Girls are often found in research studies to be more self-disciplined than boys, completing assigned tasks on time and in the manner prescribed, thus they get better grades in school even when achievement tests show that boys may have developed greater skills (Duckworth, 2006). Studies have also found boys to be more competitive and girls more cooperative (Engelhard & Monsas, 1989). It is thought that the competitive nature of boys gives them an edge in achievement and success, when solving problems quickly and getting the right answer is most important (Engelhard & Monsas, 1989). Furthermore, students who are academic risk takers, whether girls or boys, score better on tests (Ramos, 1996). While boys reportedly do better on multiple choice tests because they are more willing to gamble with a guess, girls do better on essays. However, females are often considered more compassionate than males because girls have been shown to be more likely to talk out a frustrating problem (Seng, Siang, & Wei, 1998) where boys often resort to physical aggression to solve a frustrating dilemma, in a similar problem situation (George et al., 1997).

IB Attributes

The IB attributes include: (a) inquirers, (b) thinkers, (c) communicators, (d) risk-takers, (e) knowledgeable, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective.

Inquirers

Children, by their very nature are curious. Educators tap this curiosity and use it as a major ingredient in the learning process. Inquiry-based education should begin in elementary school and include all students (Pine & Aschbacher, 2006). Inquiry means allowing students to become much more involved in the decisions about what to study and what sources and activities are necessary to complete a learning task (Tower, 2000) or as Riner (n.d.) asserts “creating a classroom where inquiry is the norm requires a tolerance of errors, supportive environments that nurture inquiring minds, and active engagement that involves meaningful activities that expand the child’s understanding of the new concepts” (p. 15).

Creating an inviting classroom where students are free to practice inquiry requires teachers to step away from the traditional sit and get delivery method of teaching. Teachers need to understand that “the natural flow from ignorance to knowledge starts with confused interest,

leading to participation, which then leads to continued exploration, which leads to knowledge" (Riner, n.d., p. 7). "Students will need opportunities to learn in a different manner, one where they are allowed to ask questions and seek their own answers. This will require practice on the part of the teacher and the student. Instructors need to educate students to question, explore, reason, collaborate, and communicate with others rather than just follow directions and memorize a body of existing knowledge" (Pine & Aschbacher, 2006, p.308).

Simply talking about inquiry is not very effective. Inquiry requires practice. Inquiry is best learned by continual practice (Riner, n.d.). Teaching by using an inquiry-based approach means that the instructor embraces the philosophy that children will make mistakes and that is how they learn. Inviting inquiry requires a tolerance of error, supportive environments that nurture inquiring intellects, and participation that involves meaningful endeavors that expand the child's understanding of the world (Riner, n.d.).

There is concern that teachers are not well prepared to teach using an inquiry-based technique. Pine and Aschbraher (2006) found that there were no significant differences between fifth-graders in hands-on inquiry and

text-based classes on three out of four investigative tasks raising important question about teacher preparation and professional development required for successful inquiry-based instruction. Tower (2000) discusses her difficulties of implementing an inquiry-based structure ultimately apologizing to her fourth graders for overwhelming them with her inquiry questions and research process. Furthermore, there are reasons to challenge the role students' questioning should play because "...a child might be in a poor position to ask educationally productive questions" (Scardamalia and Bereiter, 1992, p. 194). Children ask more questions than they can pursue, and these questions vary in their educational potential. The first question that comes to mind is not necessarily the one most worth pursuing (Scardamalia and Bereiter, 1992).

In an inquiry-based classroom, students take an active role in all areas of decision-making and assessment (Tower, 2000). This role serves students well as there is a link between the level of curiosity and the retention of information (Maw & Maw, 1961). In a study of boys who were judged by teachers and peers as being high-curiosity boys and low-curiosity boys, Maw and Maw (1970) found that children high in curiosity are also those who have

successfully interacted with their environments and, as a result, have good self-concepts.

Thinkers

Teaching our children to think has taken a front seat in the education arena (Underbakke, Borg and Peterson, 1993). Good thinking leads to good decision making. Facione (2006) believes that if people are taught to make good decisions they are equipped to improve their own future and become contributing members of society, rather than contributing to societal ills. “In primary education, ‘rote learning’ has been a term of criticism, and a progressive movement throughout the 20th Century moved to increase students’ active involvement in learning” (Nisbet, 1993, p. 282). Curriculum design changes throughout schools reflect the growing belief in the importance of developing students’ thinking skills (McKendree & Stenning, 2002). There is a sense of urgency about infusing the teaching of critical thinking into our nation’s schools. Peter Facione (2006) maintains that without critical thinking people would be hurt economically. “Without critical thinking skills people would be unable to analyze, interpret, evaluate, or explain economic trends. This could lead to a condition where whole sectors of the economy would become unpredictable, and large-scale economic disaster would

become extremely likely. There is a risk that our judicial system and economic system would collapse" (Facione, 2006, p. 19).

Pinning down a definition of thinking is like herding cats. Facione (2006) rather than identifying an abstract definition, poses question upon question that causes a reader to think. Higher order thinking is evident when one takes new or previously learned information and uses that information to achieve a purpose or problem solve (Lewis & Smith, 1993). Critical thinking can be defined as "thinking about your thinking while you're thinking in order to make your thinking better" (Paul, 2007, p. 1).

Thinking has been referred to as: (a) higher order thinking, (b) critical thinking, (c) problem solving, and (d) rational thought and reasoning (Lewis & Smith, 1993). Regardless of the title used, researchers are debating whether critical thinking can be taught (Nisbet, 1993; Riding & Powell, 1993). Lawson (1993) argues that teaching students to think can be effective at all levels, but that the degree of instruction must vary from the kindergarten student to the doctoral. Some experts question whether teachers have the expertise to properly teach students to think critically. If students are expected to learn to think critically, it may not be sensible to teach them in

an uncritical manner (Riding & Powell, 1993). Teachers need to model critical awareness in content or delivery. Lewis and Smith (1993) warn that it is not safe to assume that teachers know how to teach higher order thinking skills. In fact, there is evidence that teachers are not currently using many of the indicators of teaching for higher order thinking (Underbakke, Borg & Peterson, 1993). There is also evidence that with training, teachers can develop the competence to do so.

Communicators

The Partnership of 21st Century Skills polled American voters and found that eighty-eight percent of them believe schools should incorporate skills such as communication and self-direction. Voters agreed that the skills students need to succeed in the workplace of today are notably different from what they needed 20 years ago (Stansbury, 2007). Communication skills encompass the ability to write and speak in our mother tongue as well as in other world languages.

Former U. S. Secretary of Education Richard W. Riley (2000) stated in a public address, that people who are bi-literate may enjoy greater opportunities in our diverse nation and command a greater salary in the marketplace. The study of additional languages has, in part, been attributed

to the success of the United States in the international marketplace (Curtain & Dahlberg, 2004). Language study has been related to the skills required for happy and productive living in a future of increasing global interdependence (Curtain & Dalhberg, 2004).

If for no other reason, personal well-being is an incentive to become bilingual. It's not enough, though, to simply speak another language. Naserdeen (2001) explains that in 1998, American companies lost 40 percent of sales in the international market because they had few employees who could relate to the foreign country. Already, one in six American jobs is tied to international trade (Levine, 2005). "Study of a foreign language introduces students to non-English-speaking cultures, heightens awareness and comprehension of one's native tongue, and serves the nation's needs in commerce, diplomacy, defense, and education" (Curtain & Dahlberg, 2004, p. 394). Americans fluent in other languages increase our economic competitiveness worldwide, improve international communication, and maintain our political and security interests (Marcos, 1997).

Evidence from a California study shows language students to have a significantly higher self-concept than do non-language students (Curtain & Dahlberg, 2004). Many

benefits are thought to accrue to children who learn a second language. Those include: (a) improved performance in other basic skill areas such as reading and math, (b) improved cognitive flexibility, (c) better problem-solving, and higher-order thinking skills, (d) higher test scores on standardized tests, (e) gains on measures of performance IQ, and (f) improved communication skills, including better listening skills and a sharper memory all of which enhance career potential (Curtain & Dahlberg, 2004). Children enrolled in foreign language programs score statistically higher on standardized tests conducted in English (Marcos, 1997). Children who have learned a second language earn higher SAT scores, particularly on the verbal section of the test (Marcos, 1997).

Other studies confirm this research. Armstrong and Rogers (1997) found that third graders who were taught Spanish for thirty minutes three times per week showed statistically significant gains on their Metropolitan Achievement Tests scores in the areas of math and language after only one semester of study. It is particularly interesting to note that in this study one class of students in the experimental group had actually received one and a half fewer hours of math instruction per week,

and still outperformed the students in the control classes in math.

Aside from benefits to academic achievement, there is research that documents effects on attitudes toward other cultures as a result of the study of foreign language instruction in elementary schools. Students who assessed themselves positively also reported that they had positive attitudes toward Japanese, whereas the students who assessed themselves more poorly reported that they had more negative attitudes toward their learning experience (Donato, 2000).

Brain research comes into play when discussing the advantages of providing foreign language instruction for elementary students. Lipton (2003) says that one major reason to offer a foreign language in elementary school is because a child's brain has the greatest plasticity before the age of 10. Lipton (1996) writes that connections are easily made in the brain regarding second language acquisition at an early age and that the window of opportunity for early language learning is between birth and 10 years of age.

Lifetime bilingual individuals are more resistant to age-related losses of certain cognitive abilities than monolinguals (Schuster, 2005). Research findings suggest

that the effects of bilingual education may include physical changes in the brain that relate specifically to the second language and that affect cognitive ability (Schuster, 2005).

The 39th Annual Phi Delta Kappa/Gallup Poll of the Public's Attitude Toward the Public Schools asked voters how important they believe it is that all children in the United States learn a second language in addition to English. An overwhelming 85% of voters said that it is somewhat to very important that children learn a second language. Seventy-percent of those same voters believe that instruction in a second language should begin in elementary school (Rose & Gallup, 2007).

Research supports the trend toward teaching foreign languages to elementary school students for a multitude of reasons. Patkowski (1990) maintains that a child taught a second language after the age of 10 or so is unlikely ever to speak it like a native. There is evidence that suggests that early elementary school foreign language instruction has specific and unique advantages including (a) increased long-terms second language proficiency (where second language instruction is continued), (b) establishment of a broader frame of cultural reference and acceptance, (c) increased cognitive ability, and (d) enhancement of

creativity, mental flexibility, cognitive maturity, and communication skills (Schuster, 2005).

Marcos (1997) has found evidence that also suggests that children who receive second language instruction are more creative and better at solving complex problems. As for oral skills, early immersion students were documented as having an advantage on communicative tests of listening comprehension and speaking when compared with late immersion students. Research on early second language learning has provided evidence of cognitive, academic, and attitudinal advantages for children who start foreign language instruction early (Dominguez, 2005).

Risk-Takers

Risk-taking in the educational setting is most often associated with test taking behavior (Ramos, 1996; Ben-Shakhar & Sinai, 1991) and how boys and girls respond differently to risk-taking activities at different ages (Gullone & Moore, 2000; Morrongiello & Rennie, 1998).

Test taking behavior. Students who are risk takers score better on tests (Ramos, 1996). Boys reportedly do better on multiple-choice tests while girls perform at higher levels on essay tests (Ramos, 1996). It is hypothesized that boys do better on multiple-choice tests because they are more likely than girls to gamble with a

guess even if they are unsure of the correct answer (Ben-Shakhar & Sinai, 1991; Ramos, 1996). On essay exams it is thought that girls do better than boys because girls approach writing as personal expression, not just answer making (Pajares & Giovanni, 2001). Furthermore, males demonstrate a smaller tendency to omit test items irrespective of the content of the test and irrespective of their ability to answer the item correctly (Ben-Shakhar & Sinai, 1991). On the other hand females tend to omit more items than males perhaps because they do not feel as comfortable answering test items they are unsure of (Ben-Shakhar & Sinai, 1991).

Risk-Taking activities. Ben-Shakhar and Sinai (1991) assert that risk-taking gender differences, among boys and girls, remains constant throughout two distinct maturational levels and grade ranges including elementary grades 1st-grade through 5th-grade and intermediate through high school grades. Age was a related factor in reporting risk-taking behaviors. Younger adolescents engaged in risk-taking behaviors less frequently than older adolescents (Gullone & Moore, 2000; Morrongiello & Rennie, 1998). Morrongiello and Rennie's study (1998), boys and girls at various ages were shown pictures of an individual embarking on a risk-taking task. The facial expression on the

individuals performing the same task indicated either confidence or a wary look. Results indicated that children overall were more likely to rate an act as a risk when the look on the face did not exude confidence, however, boys' ratings of risk were not influenced to the same degree as girls' ratings of risk.

In another study boys attributed injuries to bad luck while girls assumed personal responsibility for more of their injuries (Morrongiello & Rennie, 1998). Boys rated risk as lower than girls and younger children identified fewer risk factors. Overall, girls' perceived vulnerability to injury was the best predictor of risk ratings, however, with boys, the predictor of high risk ratings were related to their judgment of how severe the potential injury might be (Hillier and Morrongiello, 1998).

Neuronal development may also play a role in how boys and girls respond to risk-taking. Girls and boys brain regions develop at different rates and in a different order. The region of the brain most involved with combining information from different sensory modalities develop along similar paths in girls and boys, however, the pace of girls' neuronal development is approximately two years ahead of boys' (Sax, 2007). This is particularly thought to be so in the region of the brain most involved with spatial

perception and object recognition, the temporal gray matter, where boys and girls neuronal development follows a similar trajectory, but boys' development is slightly faster than girls' (Sax, 2007).

Brain maturation requires a process of neuronal regression. This process is referred to as pruning. During the post-birth period, and throughout childhood, synaptic connections increase until adolescence. In what has been referred to as the inverted U-pattern synaptic densities peak some time during adolescences and then shrink into adulthood where the adult brain and the infant brain have similar neuronal densities (Hill & Thompson, 2002). This process occurs sooner in females, around middle adolescence, than males, often into the second decade of life. The fact that one region of the brain is shrinking in teenage girls while the same region is still growing in teenage boys does not mean that boys are smarter than girls. It simply means that boys and girls are different and these differences do not imply a rank order (Sax, 2007). However, this may have implications for the methods we use to instruct our girls and boys (Sax, 2007).

Knowledgeable

Historically, the stereotype has been that girls lagged behind boys academically (Gurian & Stevens, 2004;

Mead, 2006). Currently there is growing concern that boys may be lagging behind girls academically. However, Mead (2006) has found that boys are not doing worse than girls rather girls are just getting better, faster. Today the issue seems to be that boys are losing ground (Gurian & Stevens, 2004).

We know that girls and boys take different trajectories to reach the same intellectual threshold (McCarthy, 2006). Boys perform better on spatial questions, while girls outpace boys on reading and other verbal skills (Gurian & Stevens, 2004; McCarthy, 2006). Researchers have noted differences in learning trends and achievement of girls and boys (Gurian & Stevens, 2004; Mead, 2006; Sax, 2007).

Due to these differences, recommendations have been made for classroom instruction in order for girls and boys to have optimum learning experiences, acquire knowledge, and express knowledge. These recommendations include the actual physical arrangement of the classroom as well as instructional materials and teaching strategies (Gurian & Stevens, 2004; Sax, 2007). When students are taught using the constructivist theory they are coming to understand knowledge (Hare and Graber, 2007). Students learn better when there is an interaction between the student, peers in

the classroom, and the teacher, as opposed to a traditional method whereby teachers impose new knowledge upon students expected to passively receive this knowledge (Hare and Graber, 2007).

Nations (2001) discusses the four areas of educational constructivism: cognitive constructivism, social constructivism, radical constructivism, and critical constructivism. “Cognitive constructivism focuses on the individual’s knowledge acquisition as an adaptive process that results from the individual learner’s active thoughts” (Nations, 2001, p. 5). Nations (2001) reports that social constructivism focuses on the role society places in an individual’s development. This suggests that learning environments should include interaction so children can reflect on their learning and change their thoughts of what has already been learned. In this theory there is the assumption that no matter how knowledge is defined, it is in the individual’s mind, and the reflective person builds their own knowledge based on their own life experiences. Critical constructivism combines the social, radical and cognitive dimensions of constructivism (Nations, 2001).

Given the knowledge that constructivism is a process that results from learners’ actual thoughts (Nations, 2001), development of students’ questions need to be

examined. It is through the questioning skills of teachers and students that learners acquire a knowledge base (Scardamalia and Bereiter, 1991). Text-based questions are generally at a lower level than “wonderment” questions (Scrdamalia & Bereiter, 1991). In their research, Scardamalia and Bereiter (1991) found that students asked higher level questions when they were not given prior information about a topic. Also, when students did not think that their questions would require them to do more work, they asked better questions (Scardamalia & Bereiter, 1991). Overall, boys and girls seem to learn and demonstrate knowledge with equal success in constructivist-guided classrooms.

Principled

Studies have been conducted to determine whether there is a difference between males and females in their use of moral judgment (Badger, 1998; Gowing, King, Lan, McMahon & Rieger, 2005). In one study, it was found that there were no statistically significant differences in the level of moral reasoning based on gender (Gowing, King, Lan, McMahon & Rieger, 2005). The same study found few significant differences in values or value types based on gender, except for a greater concern on the part of female students for self-direction and equality.

Since the time of John Dewey, “educators have felt that assisting the child’s development through cognitive, social, and moral stages should be an important aim of education” (Kohlberg, 1986, p. vii). Instruction in deportment and attitudes is not just an add-on rather it is part of an all-encompassing school culture (Kersten, 2007). While some people feel that the school’s responsibility is to teach academics and leave moral development out of the picture (Strike, 1993) schools really are continually communicating social and moral messages when they teach students about rules and behavior (DeVries & Zan, 1994).

Creating moral classrooms is important considering that studies have concluded that there is a relationship between general deviances and academic dishonesty (Blakenship & Whitley, 2000). One example of academic dishonesty includes fabricating fraudulent excuses to avoid a testing situation. Caron, Whitbourne & Halgin (1992) found that men are more likely than women to fabricate fraudulent excuses. Findings from a study conducted by Sims (1993) indicate that subjects who admitted to having engaged in a wide range of academic dishonesty also admitted to a wide range of work-related dishonesty (Sims, 1993). It has also been found that cheaters scored higher than non-cheaters on measures of risky driving behaviors.

False excuse makers scored higher than other students on measures of substance abuse, risky driving, illegal behaviors, and personal unreliability (Caron, Whitbourne & Halgrin, 1992). In addition, men scored higher than women on substance abuse and illegal behaviors (Blankenship & Whitley, 2000).

Kohlberg, who studied differences in children's reasoning and moral dilemmas, developed a theory based on the idea that stages of moral development build on each other in order of importance and significance to the person. His theory includes three levels of morality: Preconventional Morality (age 4 – 10) conventional morality (age 10 – 13) and postconventional morality (adolescence through adulthood) (White, 1999). Within this framework it would not be possible for a 10-year-old child to have postconventional moral development and behave like an adult.

Piaget (1965) also discussed phases that children pass through on their way to developing morality. Piaget refers to four stages that include the practice of rules and soon the consciousness of rules. In his studies on moral development Piaget makes mention of the fact that boys were more concerned with rules in games than girls (Piaget, 1965).

Caring

The brain's limbic system controls emotion and caring (Brotherson, 2005). Recent studies indicate that men and woman operate differently in regard to the way they experience and show their feelings (Gurian, 2004; McCarthy, 2006). Overall, while women tend to be more empathetic men seem better able to manage their moods (McCarthy, 2006). However, there is evidence to support a female advantage in empathizing and spending more time comforting people compared to men (Baron-Cohen, 2003). Sex differences in empathy are noticeable as early as infancy when baby girls focus more on a face and boys look longer at a suspended mechanical mobile (Baron-Cohen, 2003). There also seems to be a sex difference in aggression. Males tend to show far more "direct" aggression such as pushing, hitting, and punching, while females will show more "indirect" aggression such as gossip, exclusion, and cutting remarks (Baron-Cohen, 2003).

Significant social changes in the traditional family unit coupled with the dramatic increase in violence among our youth places the school in a strategic position to help students become responsible, caring individuals (Wolfgramm, 1995). Our schools need to become places where an ethic of caring forms the centerpiece of the school program

(Wolfgramm, 1995). There is a critical need for schools to become caring communities, and schools have been identified as primary arenas for the nurture and promotion of caring. Interpersonal learning is the basis of academic learning (Chaskin & Rauner, 1995). Tragic events such as recent school shootings reaffirm the need for an ethic of caring in our schools (Wolfgramm, 1995). Caring interactions between teachers, students, and parents often make the difference between positive school experiences and frustration or alienation (Chaskin & Rauner, 1995). A sense of caring is a crucial element of programs and institutions that are successful in working with young people (Chaskin & Rauner, 1995). In the 39th Annual Gallup Poll of the Public's Attitudes Toward The Public Schools (2007), 67% of people voting responded that schools should be responsible for dealing with the behavioral, social, and emotional needs of their students (Rose & Gallup, 2007). Learning, playing, and working today almost always require social interactions among people. Social skills are a central part of these interactions and, enable people to achieve their school goals, work goals, and interpersonal goals (Elliott, Malecki & Demaray, 2001). It is widely accepted among educators and parents alike that students who consistently misbehave at school achieve less and often negatively

influence the achievement of classmates (Elliott, Malecki & Demaray, 2001). Children will not achieve in school unless they believe that they are cared for and learn to care for others (Noddings, 1995).

To have as our educational goal the production of caring, competent, loving, and lovable people is not anti-intellectual (Noddings, 1995). Students do better socially and academically when they feel safe and regarded as important members of a learning community (Curtis, 2007). “In a world filled with global violence and threats of environmental devastation, where drugs and guns are easily available, learning to be more decent and to build caring communities is hardly a waste of time” (Charney, 2002, p. 2). Two educational outcomes that society most values are students who are academically and socially successful. Clearly, social success and supportive school environments interact to become academic enablers thereby indirectly and directly affecting the outcome of academic success (Elliott, Malecki & Demaray, 2001). It is possible that students’ behavior in a classroom influences teachers’ preferences for students and that may affect the quality of instructional exchanges (Wentzel, 1993). Social behavior is a much stronger predictor of students’ grades than of their standardized test scores (Wentzel, 1993). What does it mean

to care? In her study of adolescents Bosworth (1995) found that 60% of the students could clearly articulate a definition of caring and identify specific behaviors that indicated caring. In looking at the responses from one group of adolescents, Bosworth (1995) identified five themes related to caring: helping, feelings, relationships, personal values, and activities. Within those five themes, the findings suggest that males and females share similar conceptions of caring (Bosworth, 1995). In fact, with regard to age, race or gender, there was across the board rich and multi-dimensional understanding of what caring is (Bosworth, 1995). Teaching caring requires more than one-time acts of caring such as food drives or neighborhood clean-up activities. All students need a multitude of opportunities to engage in caring activities in caring interactions within school (Bosworth, 1995). Teaching children to care must be taken seriously as a major purpose of schools. Educators must recognize that caring for students is fundamental in teaching and that developing people with a strong capacity for care is a major objective of responsible education (Nodding, 1995). Schools cannot be single purpose institutions (Lucas & Goleman, 2007). There is more to life and learning than the academic proficiency demonstrated by test scores (Noddings, 1995). We need to

teach children to give care as well as receive care. We must help children learn to contribute, to want to contribute, to believe that they have something vital to contribute (Charney, 2002).

Well-Balanced

The IBO student profile calls for students to be well-balanced (IBO, 2002). Leading a well-balanced life is associated with the emotional well being of individuals and according to Fulghum (1990) this process could begin even as early as kindergarten with activities that encourage students to, "Be aware of wonder. Live a balanced life--learn some and think some and draw and paint and sing and dance and play and work every day some" (p. 6). Research has shown that girls experience negative emotions more often than their male counterparts (Fujita, Diener & Sandvik, 1991). In their studies of gender differences in adolescent well being, Yeo, Ang, Chang & Huan (2007) found that girls registered significantly greater worries about self than boys. Girls reported significantly greater emotional distress than boys. Seiffge-Krenke & Stemmler (2002) postulate that girls may be more prone to developing mental disorders than boys. Female adolescents have reported significantly higher concerns for their emotional

well being than did male adolescents (Yeo, Ang, Chang & Huan, 2007).

What are the possible reasons for the findings that suggest females experience more highs and lows than males? Ptacek, Smith & Dodge (1994) explain that consistent with gender role expectations, where masculinity is more closely associated with active problem solving, femininity is associated with expression of emotions. Another cause for females reporting more emotional distress is their lower social status and power (Nolan-Hoeksema, Larson & Grayson, 1999). Although women may make less money than men, they appear to work more hours per week than men when all the roles that they perform are considered. Women often work full time in the workforce and do nearly all the childcare and domestic work at home (Nolan-Hoeksema, Larson & Grayson, 1999). In addition, they are also responsible for the care of sick and older family members, and this *sandwiching* leads to burnout and distress (Nolan-Hoeksema, Larson & Grayson, 1999).

Another reported reason that there seems to be a difference between female and male distress is that females report a greater willingness to self-report feelings and manifestations of stress (deAnda, Bradley, Collada, Dunn, Kubota, Hollister, et al., 1997).

It is interesting to note that while girls report more negative emotions than boys (Fujita, Diener & Sandvik, 1991; Yeo, Ang, Chang & Haun, 2007) girls report a more positive attitude toward school, better friendship skills, and stronger relations with their parents than boys (Yeo, Ang, Chang & Haun, 2007).

There are implications of this research for America's schools. Public schools in the United States are under enormous pressure to show that they are providing every student with a thorough and efficient education. Surely, we should demand more from our schools than to only educate people to be proficient in reading and mathematics and nothing more (Noddings, 2005). Given the reports of adolescent depression and stress (Hampel & Petermann, 2005; deAnda, Bradley, Collada, Dunn, Kubota, Hollister, et al., 1997) there is a terrific need for school programs that are preventative as well as of the intervention nature. These programs need to be in place in our schools to promote psychological resilience (Yeo, Ang, Chang & Huan, 2007).

Reflective

Many researchers have a hard time pinning down a real definition of reflective thinking (Griffith & Frieden, 2000; Moallem, 1997; Rodgers, 2002). However, Dewey (1933), one of the original American industrial age advocates for

broad based public education reform, noted that reflection is the “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends” (Dewey, 1933, p. 9). In contemporary terms there is agreement that true reflective thinking represents objective means for problem solving (Griffith & Frieden, 2000; Moallem, 1997). Reflective thinking then is related to the scientific process (Dewey, 1933; Rodgers, 2002). The connection is strong because true reflective thinking requires a person to state a problem, analyze the problem, form a hypothesis, test the hypothesis and draw conclusions (Rodgers, 2002). Grifith and Frieden (2000) take the process one step further and say that reflective thinking must in the end include action.

Why should educational practitioners think reflectively? Dewey (1933) believes that without reflective thinking, teachers merely repeat mindlessly the practices of their own past teaching. Reflective thinking is thinking to learn (Rodgers, 2002). Good teaching requires an instructor to think about what is happening in the class in terms of meaningful learning and possibly modify the course of action in educational lesson plans (Moallem, 1997). Careful reflection becomes easier for those who have

previous experience (Rodgers, 2002; Moallem, 1997). Thoughtful reflection reduces impulsivity (Kish, Sheehan-Holt & Cole, 1997).

Looman (2003) argues that reflection is necessary for people in leadership positions. Goleman (1995) believes that today's global challenges call for leaders who are reflective. Reflective leadership is connecting with other people at the emotional, empathic level (Looman, 2003).

There are a variety of strategies that can be used to facilitate reflective thinking which are used in the classroom including journals (Griffith & Frieden, 2000; Kish, Sheehan-Holt & Cole, 1997; Moallem, 1997; Spalding & Wilson, 2002), portfolios (Kish, Sheehan-Holt & Cole, 1997), videos (Moallem, 1997), and observations. However, according to Spalding and Wilson (2002) there is no one best strategy for improving reflective thinking or action in boys and girls. Moreover, reflective thinking takes time as individuals work together to objectively identify a problem and work towards a solution--the very antithesis of impulsive, reactive behavior (Moallem, 1997; Rodgers, 2002).

While it is important to be a reflective thinker, some researchers, interestingly, caution that there is an optimal amount of reflectiveness (Baron, 1990; Duemler &

Mayer, 1988). Sternberg (1981) believes that when students are taught to eliminate impulsive biases in the testing of hypotheses, they may also learn to give less consideration to the generation of unusual hypotheses that underlie non-entrenched kinds of tasks.

Open-Minded

The personality dimension that has the most influence in social and interpersonal arena is openness (McCrae, 1996). “Openness is a broad and general dimension, seen in vivid fantasy, artistic sensitivity, depth of feeling, behavioral flexibility, intellectual curiosity, and unconventional attitudes” (McCrae, 1996, p. 323). Highly open people claim to be exceptional, and some of them are (McCrae, 1996). Personality traits affect social interactions. Traits in the domain of openness have powerful and pervasive influences (McCrae, 1996). In fact, McCrae (1996) argues, variations in experiential openness are the major psychological determinant of political polarities.

Discussions of critical thinking in the educational and psychological literature point to the importance of reasoning styles that foster the practice of evaluating arguments and evidence in a way that is open to beliefs other than your own (Stanovich & West, 1997). To reason

objectively about issues that are different from prior beliefs is often seen as the epitome of critical thought (Stanovich & West, 1997). In their study of open-minded thought, Stanovich and West (1997) found strong relationships between cognitive ability and the tendency to evaluate evidence independent of prior beliefs.

In a study that investigated dynamics of controversy and the effects of its cooperative and competitive contexts, Tjosvold and Deemer (1980) found that cooperative controversy induced openness. Competitive controversy resulted in closed-mindedness and little interest or acceptance of the other's position (Tjosvold & Deemer, 1980). Avoidance of controversy produced openness but little interest or actual knowledge of the other's arguments and a decision that reflected one person's views only (Tjosvold & Deemer, 1980). It is thought that some people resist persuasion attempts and compromises in part because to do otherwise would be costly to their sense of identity and self-integrity (Cohen, Bastardi, Sherman, McGoey & Ross, 2007).

While boys and girls participating in IB schools are learning and modeling the ten IB attributes including: (a) inquirers, (b) thinkers, (c) communicators, (d) risk-takers, (e) knowledgeable, (f) principled, (g) caring, (h)

open-minded, (i) well-balanced, and (j) reflective it is not clear from the research literature if the instruction will positively impact 4th-grade and 5th-grade girls and boys equally.

CHAPTER THREE

Methodology

Participants

Number of participants. The number of participants was 60. The participants were 4th-grade and 5th-grade girls (*n* = 30) and 4th-grade and 5th-grade boys (*n* = 30) enrolled in an elementary school program that was designated as an International IBPYP Candidate School. All participants were in classrooms with teachers who have completed IBPYP Level 1 training.

Gender of the subjects. The 60 students selected as participants for this study were a randomly selected group of 4th-grade and 5th-grade girls (*n* = 30) and 4th-grade and 5th-grade boys (*n* = 30). No individual identifiers were attached to the achievement data, the SSALP data or the report card data.

Age Range of the Subjects. The age range of the participants was from 8 to 11 years. By the end of the 2006-2007 school year participants had completed the 4th-grade or the 5th-grade.

Racial and ethnic origin. The racial and ethnic origin ratio was congruent with enrollment patterns in the participating school. The current enrollment shows 87%

White, not Hispanic; 1% Black, not Hispanic; 1% Hispanic; and 11% Asian/Pacific Islanders.

Inclusion criteria. Fourth-grade and 5th-grade students who attended the IBPYP candidate school, participated in all IBPYP learning activities, completed the Student Self-Assessment Learner Profile (SSALP) at the beginning of the 2006-2007 school year, and completed the SSALP at the end of the school year were eligible to participate in the study.

Method of subject identification. The 60 students selected for this study were 4th-grade and 5th-grade students who attended the IBPYP candidate school. No individual identifiers were attached to the SSALP or achievement data.

Description of Procedures

Research design. The study design was a two-arm pretest posttest comparative survey study to determine the impact of International Baccalaureate curriculum on intermediate level girls' compared to boys' perceptions of their learned global citizenship attributes. Following is the research design in notation:

Group 1 X_1 O_1 X_2 O_2

Group 2 X_1 O_1 X_3 O_2

Group 1 = naturally formed group of intermediate 4th-grade and 5th-grade level girls (n = 30)

Group 2 = naturally formed group of intermediate 4th-grade and 5th-grade level boys (n = 30)

X_1 = uniform IBPYP school curriculum and academic curriculum for 2006-2007 school year.

X_2 = intermediate level girls participating in the IBPYP school curriculum and academic curriculum

X_3 = intermediate level boys participating in the IBPYP school curriculum and academic curriculum

O_1 = Pretest 1. IBPYP Attributes as measured by the SSALP beginning of the school year student report for: (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective; 2. Achievement as measured by first quarter grades in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies; and 3. Life Skills as measured by first quarter grades in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

O_2 = Posttest 1. IBPYP Attributes as measured by the SSALP end of the school year student report for: (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective; 2. Achievement as measured by fourth quarter grades in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies; and 3. Life Skills as measured by fourth quarter grades in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

The purpose of this study was to determine the impact of a founding yearlong school wide International Baccalaureate Primary Years Programme (IBPYP) curriculum on intermediate grade level girls' perceptions of their learned global citizenship attributes compared to intermediate grade level boys' perceptions of their learned global citizenship attributes.

Independent Variable Descriptions

Girls and boys completed classes starting at 8:45 a.m. and ending at 3:30 p.m. Monday through Friday. All students were required to complete the same courses including: (a)

reading/writing/language arts, (b) mathematics, (c) social studies, (d) science, (e) Spanish, (f) physical education, (g) music, (h) art, and (i) technology. The 10 IBPYP attributes were infused in all lessons. School visuals, in hallways and in classrooms, supported incidental and direct learning of the 10 IB attributes. Expectations for girls' and boys' academic achievement and deportment based on the 10 IB attributes were the same. All classes, including physical education, were coeducational. The research school recently completed an international accreditation review of its IB early years programme and is waiting for the final written IB authorization report.

Dependent Measures

Dependent measures included a 10 IB attributes student profile, course grades, and life skills. The student profile was analyzed using the Student Self Assessment Learner Profile survey. Data was collected retrospectively.

Achievement data were collected retrospectively and were analyzed using the dependent measure of report card grades for: (a) reading, (b) math, (c) language, (d) science, and (e) social studies.

Life skills data were collected retrospectively using the dependent measure of report card grades for: (a) cooperating with others to complete a task or goal, (b) is

trustworthy and honest, (c) has a positive attitude, respects individual differences, (d) respects the rights of others, and (e) uses kind words, actions.

Research Questions and Data Analysis

The following research questions were used to analyze student participation in the IBPYP measuring SSALP attributes.

Overarching Pretest-Posttest Learner Profile Research Question #1: Do intermediate grade level students who participate in the IBPYP lose, maintain, or improve their beginning of the year compared to ending of the year SSALP scores reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains?

Sub-Question 1a. Is there a significant difference between intermediate grade level girls beginning of the year compared to ending of the year SSALP scores reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains?

Sub-Question 1b. Is there a significant difference between intermediate grade level boys beginning

of the year compared to ending of the year SSALP scores reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains?

Research Sub-Questions #1a and 1b were analyzed using dependent *t* tests to examine the significance of the difference between intermediate level student's beginning compared to ending of the school year SSALP domain scores. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed on tables.

Overarching Posttest-Posttest Learner Profile Research Question #2: Do intermediate grade level students who participate in the IBPYP have congruent or different ending of the year compared to ending of the year SSALP scores reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains?

Sub-Question 2. Is there a significant difference between intermediate grade level girls ending of the year compared to intermediate grade level boys ending of the

year SSALP scores reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains?

Research Sub-Question #2 was analyzed using independent *t* tests to examine the significance of the difference between intermediate level girls' and boys' ending of the school year SSALP domain scores compared to ending of the school year SSALP domain scores. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed on tables.

The following research questions were used to analyze student achievement.

Overarching Pretest-Posttest Achievement Research Question #3: Do intermediate grade level students who participate in the IBPYP lose, maintain, or improve their beginning of the year compared to ending of the year grades for achievement in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies?

Sub-Question 3a. Is there a significant difference between intermediate grade level girls beginning of the year compared to ending of the year grades for

achievement in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies?

Sub-Question 3b. Is there a significant difference between intermediate grade level boys beginning of the year compared to ending of the year grades for achievement in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies?

Research Sub-Questions #3a and 3b were analyzed using dependent *t* tests to examine the significance of the difference between intermediate level student's beginning compared to ending of the school year grades for achievement in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed on tables.

Overarching Posttest-Posttest Achievement Research Question #4: Do intermediate grade level students who participate in the IBPYP have congruent or different ending of the year compared to ending of the year achievement levels as determined by grades in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies?

Sub-Question 4. Is there a significant difference between intermediate grade level girls ending of the year

compared to intermediate grade level boys ending of the year achievement levels as determined by grades in: (a) reading, (b) math, (c) language, (d) science, and (e) social studies?

Research Sub-Question #4 was analyzed using independent *t* tests to examine the significance of the difference between intermediate grade level students' ending of the school year achievement grades. Because multiple statistical tests was conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations were displayed on tables.

The following research questions are used to analyze student life skills.

Overarching Pretest-Posttest Life Skills Research Question #5: Do intermediate grade level students who participate in the IBPYP lose, maintain, or improve their beginning of the year compared to ending of the year life skill grades in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Sub-Question 5a. Is there a significant difference between intermediate grade level girls beginning

of the year compared to ending of the year life skills ratings in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Sub-Question 5b. Is there a significant difference between intermediate grade level boys beginning of the year compared to ending of the year life skills ratings in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Research Sub-Questions #5a and 5b were analyzed using dependent *t* tests to examine the significance of the difference between intermediate level student's beginning compared to ending of the school year life skills ratings in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to help control for Type 1 errors. Means and standard deviations are displayed on tables.

Overarching Posttest-Posttest Life Skills Research Question #6: Do intermediate grade level students who participate in the IBPYP have congruent or different ending of the year compared to ending of the year achievement levels as determined by life skills ratings in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Sub-Question 6. Is there a significant difference between intermediate grade level girls ending of the year compared to intermediate grade level boys ending of the year life skills as determined by grades in: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

Research Sub-Question #6 was analyzed using an independent *t* test to examine the significance of the difference between intermediate level student's ending of the school compared to ending of the school year life skills ratings. Because multiple statistical tests were conducted, a one-tailed .01 alpha level was employed to

help control for Type 1 errors. Means and standard deviations are displayed on tables.

Data Collection Procedure. All study achievement data was retrospectively, archival, and routinely collected school information. Permission from the appropriate school research personnel was obtained. Profile data was obtained retrospectively via survey. A random sampling of 30 students in each independent arm was obtained to include achievement and report card data. Non-coded numbers were used to display individual de-identified profile data as well as report card data. Aggregated group data, descriptive statistics, and parametric statistical analyses were utilized and reported with means and standard deviations on tables.

Performance site. The research was conducted in a public school setting through normal educational practices. The study procedures did not interfere in any way with the normal educational practices of the public school and did not involve coercion or discomfort of any kind. All data were analyzed in the office of the researcher. Data were stored on spreadsheets and computer disks for statistical analysis. Data and computer disks were kept in a locked closet. No individual identifiers were attached to the data.

Institutional Review Board (IRB) for the Protection of Human Subjects Approval Category. The exemption categories for this study were provided under 45CFR46.101(b) categories 1 and 4. The research was conducted using routinely collected archival data. A letter of support from the research school district is located in Appendix A.

CHAPTER FOUR

Results

Purpose of the Study

The purpose of this study was to determine the impact of a founding yearlong school wide International Baccalaureate Primary Years Programme (IBPYP) curriculum on intermediate grade level girls' perceptions of their learned global citizenship attributes compared to intermediate grade level boys' perceptions of their learned global citizenship attributes.

Independent Variable

Girls and boys completed classes starting at 8:45 a.m. and ending at 3:30 p.m. Monday through Friday. All students were required to complete the same courses including: (a) reading/writing/language arts, (b) mathematics, (c) social studies, (d) science, (e) Spanish, (f) physical education, (g) music, (h) art, and (i) technology. The 10 IBPYP attributes were infused in all lessons. School visuals, in hallways and in classrooms, supported incidental and direct learning of the 10 IB attributes. Expectations for girls and boys academic achievement and deportment based on the 10 IB attributes were the same. All classes, including physical education, were coeducational. The research school recently completed an international accreditation review of

its IB early years programme and is waiting for the final written IB authorization report.

Dependent Measures

Dependent measures included a 10 IB attributes student profile, course grades, and life skills teacher ratings of students. The Student profile was analyzed using the Student Self Assessment Learner Profile survey. Student Self Assessment Learner IB Profile scores were reported for (a) inquirers, (b) knowledgeable, (c) critical thinkers, (d) communicators, (e) risk-takers, (f) principled, (g) caring, (h) open-minded, (i) well-balanced, and (j) reflective domains. Dependent achievement measures included report card grades for: (a) reading, (b) math, (c) language, (d) science, and (e) social studies. Life skills data were collected retrospectively. Dependent life skills teacher ratings of students were: (a) cooperating with others to complete a task or goal, (b) is trustworthy and honest, (c) has a positive attitude, (d) respects individual differences, (e) respects the rights of others, and (f) uses kind words, actions.

All study achievement data related to each of the dependent variables were retrospective, archival, and routinely collected school information. Permission was obtained from the appropriate school research personnel and

the University of Nebraska Medical Center/University of Nebraska at Omaha Combined Institutional Review Board for the Protection of Human Subjects before data were collected and analyzed.

Data Analysis

Table 1 displays the girls who participated in the International Baccalaureate Primary Years Curriculum pretest student Self Assessment Learner Profile likert scores. Table 2 displays the girls who participated in the International Baccalaureate Primary Years Curriculum posttest student Self Assessment Learner Profile likert scores. Boys who participated in the International Baccalaureate Primary Years Curriculum pretest student Self Assessment Learner Profile likert scores are found in Table 3. Table 4 displays the boys who participated in the International Baccalaureate Primary Years Curriculum posttest student Self Assessment Learner Profile likert scores.

Research Question #1

Research Question #1a. The first hypothesis analyzing girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile score results utilizing a dependent *t* test were displayed in Table 5. As

seen in Table 5 the null hypothesis was rejected for five of the ten learner profile subtest scores. The pretest Inquires score (M = 2.30, SD = 0.60) compared to the posttest Inquires score (M = 1.73, SD = 0.64) was statistically significantly different, $t(29) = -4.26$, p = 0.0001 (one-tailed), d = .91. The pretest Knowledgeable score (M = 3.00, SD = 0.83) compared to the posttest Knowledgeable score (M = 1.93, SD = 0.83) was statistically significantly different, $t(29) = -5.96$, p = 0.0001 (one-tailed), d = 1.28. The pretest Critical Thinkers score (M = 2.10, SD = 0.61) compared to the posttest Critical Thinkers score (M = 1.57, SD = 0.68) was statistically significantly different, $t(29) = -3.40$, p = 0.001 (one-tailed), d = .82. The pretest Communicators score (M = 1.93, SD = 0.64) compared to the posttest Communicators score (M = 1.47, SD = 0.63) was statistically significantly different, $t(29) = -3.75$, p = 0.0004 (one-tailed), d = .72. The pretest Risk Takers score (M = 2.00, SD = 0.98) compared to the posttest Risk Takers score (M = 1.73, SD = 0.69) was not statistically significantly different, $t(29) = -1.31$, p = 0.10 (one-tailed), d = .32. The pretest Principled score (M = 1.93, SD = 0.69) compared to the posttest Principled score (M = 1.63, SD = 0.67) was not statistically significantly different, $t(29) = -1.80$, p = 0.04 (one

tailed), d = .44. The pretest Caring score (M = 1.53, SD = 0.63) compared to the posttest Caring score (M = 1.17, SD = 0.38) was statistically significantly different, $t(29) = -3.61$, p = 0.001 (one-tailed), d = .71. The pretest Open Minded score (M = 1.73, SD = 0.64) compared to the posttest Open Minded score (M = 1.43, SD = 0.63) was not statistically significantly different, $t(29) = -1.87$, p = 0.04 (one-tailed), d = .47. The pretest Well Balanced score (M = 1.93, SD = 0.74) compared to the posttest Well Balanced score (M = 1.67, SD = 0.92) was not statistically significantly different, $t(29) = -1.55$, p = 0.07 (one-tailed), d = .31. The pretest Reflective score (M = 1.70, SD = 0.65) compared to the posttest Reflective score (M = 1.73, SD = 0.78) was not statistically significantly different, $t(29) = -0.21$, p = 0.42 (one-tailed), d = .04.

Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile did significantly improve their Inquires, Knowledgeable, Critical Thinkers, Communicators, and Caring scores. Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile did not

significantly improve their Risk Takers, Principled, Open Minded, Well Balanced and Reflective scores. Pretest-posttest results for nine of the ten subtest domain areas were in the direction of improvement with lower scores at posttest yielding negative *t* test results. Reflective results were in the direction of a higher but not statistically significantly different posttest score. All posttest girls Student Self Assessment Learner Profile subtest mean scores ranged from 1.93 to 1.17 representing student agree to strongly agree responses. Given the consistent *t* test results in the direction of improvement for nine of the ten subtests and the consistency of scores in the agree to strongly agree range it may be said that girls responded positively to the IB learner attributes curriculum.

Research Question #1b. The first hypothesis analyzing boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile score results utilizing a dependent *t* test were displayed in Table 6. As seen in Table 6 the null hypothesis was rejected for two of the ten learner profile subtest scores. The pretest Inquires score (M = 2.47, SD = 0.73) compared to the posttest Inquires score (M = 2.10, SD = 0.61) was

statistically significantly different, $t(29) = -2.63$, $p = 0.01$ (one-tailed), $d = .55$. The pretest Knowledgeable score ($M = 2.90$, $SD = 1.06$) compared to the posttest Knowledgeable score ($M = 2.20$, $SD = 0.81$) was statistically significantly different, $t(29) = -4.03$, $p = 0.0002$ (one-tailed), $d = 0.74$. The pretest Critical Thinkers score ($M = 2.20$, $SD = 1.00$) compared to the posttest Critical Thinkers score ($M = 2.07$, $SD = 0.94$) was not statistically significantly different, $t(29) = -0.61$, $p = 0.27$ (one-tailed), $d = .13$. The pretest Communicators score ($M = 2.10$, $SD = 0.92$) compared to the posttest Communicators score ($M = 1.90$, $SD = 0.96$) was not statistically significantly different, $t(29) = -1.18$, $p = 0.12$ (one-tailed), $d = .21$. The pretest Risk Takers score ($M = 2.13$, $SD = 0.97$) compared to the posttest Risk Takers score ($M = 1.67$, $SD = 0.76$) was not statistically significantly different, $t(29) = -2.14$, $p = 0.02$ (one-tailed), $d = .53$. The pretest Principled score ($M = 2.10$, $SD = 0.61$) compared to the posttest Principled score ($M = 2.00$, $SD = 0.87$) was not statistically significantly different, $t(29) = -0.72$, $p = 0.24$ (one tailed), $d = .13$. The pretest Caring score ($M = 1.87$, $SD = 0.82$) compared to the posttest Caring score ($M = 1.77$, $SD = 0.73$) was not statistically significantly different, $t(29) = -0.62$, $p = 0.27$ (one-tailed), $d = .12$.

The pretest Open Minded score (M = 2.03, SD = 0.96) compared to the posttest Open Minded score (M = 2.03, SD = 0.85) was not statistically significantly different, $t(29) = 0.00$, p = 0.50 (one-tailed), d = .00. The pretest Well Balanced score (M = 2.43, SD = 0.97) compared to the posttest Well Balanced score (M = 2.20, SD = 1.06) was not statistically significantly different, $t(29) = -1.10$, p = 0.14 (one-tailed), d = .22. The pretest Reflective score (M = 2.23, SD = 1.10) compared to the posttest Reflective score (M = 2.10, SD = 0.96) was not statistically significantly different, $t(29) = -0.52$, p = 0.30 (one-tailed), d = .12.

Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile did significantly improve their Inquires and Knowledgeable scores. Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile did not significantly improve their Critical Thinkers, Communicators, Risk Takers, Principled, Caring, Open Minded, Well Balanced, and Reflective scores. Pretest-posttest results for nine of the ten subtest domain

areas were in the direction of improvement with lower scores at posttest yielding negative *t* test results. Open-Minded results yielded identical pretest and posttest mean scores. Posttest boys Student Self Assessment Learner Profile subtest mean scores ranged from 2.20 to 1.67 representing student agree, seven subtests, to strongly agree, three subtests, responses. Given the consistent *t* test results in the direction of improvement for nine of the ten subtests and the consistency of scores in the agree range it may be said that boys responded positively to the IB learner attributes curriculum.

Research Question #2

The second hypothesis was tested using the independent *t* test. A comparison of girls and boys who participated in the International Baccalaureate Primary Years Curriculum posttest compared to posttest Student Self Assessment Learner Profile score results were displayed in Table 7. As seen in Table 7 the predetermined .01 alpha level set for rejecting the null hypothesis was obtained for four measured girl versus boy posttest Self Assessment Learner Profile subtests where girls scores were lower than the boys scores for subtests including Inquirers, Critical Thinkers, Caring, and Open-Minded. Also as seen in Table 7 the predetermined .01 alpha level set for rejecting the

null hypothesis was not obtained for six measured Student Self Assessment Learner Profile subtests including Knowledgeable, Communicators, Risk Takers, Principled, Well-Balanced, and Reflective.

Overall, the girls posttest Student Self Assessment Learner Profile scores on nine subtests were lower than the boys posttest scores, in the strongly agree range, for: Inquirers, Knowledgeable, Critical Thinkers, Communicators, Principled, Caring, Open-Minded, Well-Balanced, and Reflective. However, the boys posttest Student Self Assessment Learner Profile score on one subtest was lower than the girls posttest score, in the strongly agree range, for: Risk-Takers. Given the consistently lower mean score results in nine out of ten subtests and reported statistical difference for four of the posttest subtest areas measured--Inquirers, Critical Thinkers, Caring, and Open-Minded--indicates that girls self reported benefit after participating in the IB curriculum may be considered somewhat greater than boys self reported benefit.

Table 8 displays the girls who participated in the International Baccalaureate Primary Years Curriculum pretest and posttest reading, math, language, science, and social studies grades. Table 9 displays the boys who participated in the International Baccalaureate Primary

Years Curriculum pretest and posttest reading, math, language, science, and social studies grades.

Research Question #3

Research Question #3a. The third hypothesis analyzing girls who participated in the International Baccalaureate Primary Years Curriculum pretest and posttest Reading, Math, Language, Science, and Social Studies grade results utilizing a dependent *t* test were displayed in Table 10. As seen in Table 10 the null hypothesis was rejected for one of the five academic grades, Science. The pretest Reading grade (M = 1.40, SD = 0.56) compared to the posttest Reading grade (M = 1.33, SD = 0.48) was not statistically significantly different, $t(29) = -0.70$, p = 0.24 (one-tailed), d = .13. The pretest Language grade (M = 1.43, SD = 0.57) compared to the posttest Language grade (M = 1.40, SD = 0.56) was not statistically significantly different, $t(29) = -0.37$, p = 0.36 (one-tailed), d = 0.05. The pretest Math grade (M = 1.43, SD = 0.63) compared to the posttest Math grade (M = 1.53, SD = 0.63) was not statistically significantly different, $t(29) = 1.14$, p = 0.13 (one-tailed), d = .15. The pretest Science grade (M = 1.57, SD = 0.68) compared to the posttest Science grade (M = 1.30, SD = 0.60) was statistically significantly different, $t(29) = -2.28$, p = 0.01 (one-tailed), d = .42. The pretest Social

Studies grade (M = 1.23, SD = 0.43) compared to the posttest Social Studies grade (M = 1.27, SD = 0.45) was not statistically significantly different, $t(29) = 0.37$, p = 0.36 (one-tailed), d = .09.

Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did significantly improve their Science score at posttest and had grades in the direction of improvement for Reading, Language, and Science. Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did not significantly improve their Math and Social Studies grades at posttest. Pretest-posttest results for three of the five academic grade areas Reading, Language, and Science were in the direction of improvement with lower scores at posttest yielding negative t test results. Math and Social Studies grade results were in the direction of a higher but not statistically significantly different posttest score. All posttest academic area mean grade scores ranged from 1.53 to 1.27 representing grades within the A range. Given the consistency of the posttest grades across all academic areas and considering that the pretest grades, ranging from 1.57 to 1.23, that were within

the A range, it may be said that girls responded positively to the IB learner attributes curriculum.

Research Question #3b. The third hypothesis analyzing boys who participated in the International Baccalaureate Primary Years Curriculum pretest and posttest reading, math, language, science, and social studies grade results utilizing a dependent *t* test were displayed in Table 11. As seen in Table 11 the null hypothesis was rejected for two of the five academic grades, Math, in the direction of a worsening grade, and Science, in the direction of improvement. The pretest Reading grade (M = 1.60, SD = 0.72) compared to the posttest Reading grade (M = 1.40, SD = 0.56) was not statistically significantly different, $t(29) = -1.53$, $p = 0.07$ (one-tailed), $d = .31$. The pretest Language grade (M = 1.70, SD = 0.70) compared to the posttest Language grade (M = 1.63, SD = 0.61) was not statistically significantly different, $t(29) = -0.57$, $p = 0.29$ (one-tailed), $d = 0.10$. The pretest Math grade (M = 1.57, SD = 0.68) compared to the posttest Math grade (M = 1.83, SD = 0.70) was statistically significantly different, $t(29) = 2.80$, $p = 0.004$ (one-tailed), $d = .37$, in the direction of a worsening grade. The pretest Science grade (M = 1.80, SD = 0.71) compared to the posttest Science grade (M = 1.30, SD = 0.60) was statistically significantly

different, $t(29) = -3.34$, $p = 0.001$ (one-tailed), $d = .76$. The pretest Social Studies grade ($M = 1.33$, $SD = 0.61$) compared to the posttest Social Studies grade ($M = 1.23$, $SD = 0.50$) was not statistically significantly different, $t(29) = -0.90$, $p = 0.19$ (one-tailed), $d = .18$.

Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did significantly improve their Science score at posttest and had grades in the direction of improvement for Reading, Language, Science, and Social Studies. Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did not significantly improve their Reading, Language, Math (statistically significantly different in the direction of a worsening grade) and Social Studies grades at posttest. Pretest-posttest results for four of the five academic grade areas Reading, Language, Science, and Social Studies were in the direction of improvement with lower scores at posttest yielding negative t test results. All posttest academic area mean grade scores ranged from 1.83 to 1.23 representing grades within the A range. Given the consistency of the posttest grades across all academic areas and considering that the pretest

grades, ranging from 1.80 to 1.33, that were within the A range, it may be said that boys responded positively to the IB learner attributes curriculum.

Research Question #4

The fourth hypothesis was tested using the independent *t* test. A comparison of girls and boys who participated in the International Baccalaureate Primary Years Curriculum posttest compared to posttest academic grades score results were displayed in Table 12. As seen in Table 12 the predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for any of the five measured girl versus boy posttest academic grades subtests where girls scores were lower, in the direction of A, than the boys scores for subtests including Reading, Language, and Math. Also as seen in Table 12 boys' scores for Social Studies was lower, in the direction of A, than the girls' scores. Girls' and boys' mean scores for Science were identical.

Overall, the girls' posttest grade scores on three of the five subtests measured were lower than the boys' posttest grade scores, in the direction of a grade of A, including Reading, Language, and Math. Boys' posttest grade score on one of the five subtests measured was lower than the girls' posttest grade score, in the direction of a

grade of A, for Social Studies. Girls' and boys' posttest mean scores, in the direction of a grade of A, for Science were identical. The null hypothesis was not rejected for any of the five posttest girls' versus posttest boys' academic grade comparisons. Therefore, it may be said that girls and boys classroom performance in Reading, Language, Math, Science, and Social Studies as reflected by their grade results, awarded by their teachers, indicated that girls and boys seemed to have equally benefited from participation in the IB curriculum.

Table 13 displays the girls who participated in the International Baccalaureate Primary Years Curriculum pretest Life Skills ratings. Table 14 displays the girls who participated in the International Baccalaureate Primary Years Curriculum posttest Life Skills ratings. Table 15 displays the boys who participated in the International Baccalaureate Primary Years Curriculum pretest Life Skills ratings. Table 16 displays the boys who participated in the International Baccalaureate Primary Years Curriculum posttest Life Skills ratings.

Research Question #5

Research Question #5a. The fifth hypothesis analyzing girls who participated in the International Baccalaureate Primary Years Curriculum pretest and posttest Life Skills

ratings utilizing a dependent *t* test were displayed in Table 17. As seen in Table 17 the null hypothesis was rejected for six of the six Life Skills ratings. The pretest Cooperating with Others rating (*M* = 2.00, *SD* = 0.00) compared to the posttest Cooperating with Others rating (*M* = 1.63, *SD* = 0.49) was statistically significantly different, *t*(29) = -4.10, *p* = 0.0002 (one-tailed), *d* = 1.51. The pretest Trustworthy and Honest rating (*M* = 1.97, *SD* = 0.18) compared to the posttest Trustworthy and Honest rating (*M* = 1.53, *SD* = 0.51) was statistically significantly different, *t*(29) = -4.71, *p* = 0.00003 (one-tailed), *d* = 1.27. The pretest Positive Attitude rating (*M* = 1.97, *SD* = 0.18) compared to the posttest Positive Attitude rating (*M* = 1.60, *SD* = 0.50) was statistically significantly different, *t*(29) = -3.61, *p* = 0.001 (one-tailed), *d* = 1.08. The pretest Respects Individual Differences rating (*M* = 2.00, *SD* = 0.00) compared to the posttest Respects Individual Differences rating (*M* = 1.70, *SD* = 0.47) was statistically significantly different, *t*(29) = -3.53, *p* = 0.001 (one-tailed), *d* = 1.27. The pretest Respects the Rights of Others rating (*M* = 2.00, *SD* = 0.00) compared to the posttest Respects the Rights of Others rating (*M* = 1.73, *SD* = 0.45) was statistically significantly different, *t*(29) =

-3.25, p = 0.001 (one-tailed), d = 1.20. The pretest Uses Kind Words, Actions rating (M = 2.00, SD = 0.00) compared to the posttest Uses Kind Words, Actions rating (M = 1.67, SD = 0.48) was statistically significantly different, $t(29)$ = -3.81, p = 0.0003 (one-tailed), d = 1.37.

Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum did statistically significantly improve their Life Skills ratings for all six subtests Cooperating with Others, Trustworthy and Honest, Positive Attitude, Respects Individual Differences, Respects the Rights of Others, and Uses Kind Words, Actions. All posttest Life Skills mean ratings ranged from 1.73 to 1.53 representing ratings within the Exceeds Expectations range. Given the consistency of the posttest Life Skills mean ratings across all Life Skills areas and considering that the pretest Life Skills mean ratings, ranging from 2.00 to 1.97, that were for the most part within the Satisfactory/Meet Expectations range, it may be said that girls responded positively to the IB learner attributes curriculum.

Research Question #5b. The fifth hypothesis, analyzing boys who participated in the International Baccalaureate Primary Years Curriculum pretest and posttest Life Skills ratings utilizing a dependent t test were displayed in

Table 18. As seen in Table 18 the null hypothesis was rejected for four of the six Life Skills ratings. The pretest Cooperating with Others rating (M = 2.07, SD = 0.25) compared to the posttest Cooperating with Others rating (M = 1.80, SD = 0.76) was not statistically significantly different, $t(29) = -2.11$, p = 0.02 (one-tailed), d = 0.53. The pretest Trustworthy and Honest rating (M = 2.03, SD = 0.18) compared to the posttest Trustworthy and Honest rating (M = 1.67, SD = 0.66) was statistically significantly different, $t(29) = -3.61$, p = 0.001 (one-tailed), d = 0.85. The pretest Positive Attitude rating (M = 2.03, SD = 0.18) compared to the posttest Positive Attitude rating (M = 1.70, SD = 0.47) was statistically significantly different, $t(29) = -3.81$, p = 0.0003 (one-tailed), d = 1.01. The pretest Respects Individual Differences rating (M = 2.00, SD = 0.00) compared to the posttest Respects Individual Differences rating (M = 1.73, SD = 0.45) was statistically significantly different, $t(29) = -3.25$, p = 0.001 (one-tailed), d = 1.20. The pretest Respects the Rights of Others rating (M = 2.00, SD = 0.00) compared to the posttest Respects the Rights of Others rating (M = 1.90, SD = 0.55) was not statistically significantly different, $t(29) = -1.00$, p = 0.16 (one-tailed), d = 0.18. The pretest

Uses Kind Words, Actions rating (M = 2.03, SD = 0.18) compared to the posttest Uses Kind Words, Actions rating (M = 1.77, SD = 0.63) was statistically significantly different, $t(29) = -2.80$, $p = 0.004$ (one-tailed), $d = 0.64$.

Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum did statistically significantly improve their Life Skills ratings for four subtests Trustworthy and Honest, Positive Attitude, Respects Individual Differences, and Uses Kind Words, Actions. Boys who participated in the International Baccalaureate Primary Years Curriculum did not statistically significantly improve their Life Skills ratings for two subtests Cooperating with Others and Respects the Rights of Others. All posttest Life Skills mean ratings ranged from 1.80 to 1.67 representing ratings within the Exceeds Expectations range. Given the consistency of the posttest Life Skills mean ratings across all Life Skills areas and considering that the pretest Life Skills mean ratings, ranging from 2.07 to 2.00, that were for the most part within the Satisfactory/Meet Expectations range, it may be said that boys responded positively to the IB learner attributes curriculum.

Research Question #6

The sixth hypothesis was tested using the independent *t* test. A comparison of girls and boys who participated in the International Baccalaureate Primary Years Curriculum posttest compared to posttest Life Skills ratings were displayed in Table 19. As seen in Table 19 the predetermined .01 alpha level set for rejecting the null hypothesis was not obtained for any of the six measured girl versus boy posttest Life Skills Teachers ratings where girls scores were lower, in the direction of Exceeds Expectations, than the boys scores for subtests including Cooperating with Others, Trustworthy and Honest, Positive Attitude, Respects Individual Differences, Respects the Rights of Others, and Uses Kind Words, Actions.

Overall, the girls' posttest Life Skills ratings on all six subtests were lower than the boys' posttest Life Skills ratings, in the direction of Exceeds Expectations, including Cooperating with Others, Trustworthy and Honest, Positive Attitude, Respects Individual Differences, Respects the Rights of Others, and Uses Kind Words, Actions. The null hypothesis was not rejected for any of the six posttest girls' versus posttest boys' Life Skills ratings comparisons. Therefore, it may be said that girls and boys Life Skills reflected by their Life Skills ratings

in Cooperating with Others, Trustworthy and Honest, Positive Attitude, Respects Individual Differences, Respects the Rights of Others, and Uses Kind Words, Actions, awarded by their teachers, indicated that girls and boys equally benefited from participation in the IB curriculum.

Table 1

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Student Self Assessment Learner Profile Likert Scores (a, b)

	A	B	C	D	E	F	G	H	I	J
1.	2	3	2	1	3	1	1	2	2	1
2.	3	4	2	3	1	2	1	3	1	2
3.	2	3	2	2	1	1	1	1	1	1
4.	1	2	2	2	1	2	1	1	1	1
5.	2	3	2	2	3	3	2	2	2	2
6.	2	3	2	2	1	2	1	2	2	1
7.	2	3	2	2	1	2	1	1	2	1
8.	2	3	2	3	3	3	3	2	3	2
9.	2	3	2	2	2	1	2	2	2	3
10.	2	2	2	1	1	1	1	2	1	1
11.	4	4	3	2	4	3	2	2	1	2
12.	2	3	2	1	2	2	1	2	2	1
13.	2	3	3	2	3	3	2	3	2	3
14.	2	1	2	2	3	2	2	1	1	2
15.	3	4	1	1	1	2	1	1	2	1
16.	2	4	3	2	1	2	1	2	1	1
17.	2	4	2	2	2	2	2	2	2	1
18.	2	2	2	2	2	1	2	2	1	1
19.	2	5	2	2	1	1	1	1	2	1
20.	3	4	4	2	3	2	1	1	3	2
21.	3	2	3	2	1	2	2	1	2	2
22.	2	3	1	2	1	2	1	1	2	2
23.	3	2	2	1	4	2	1	3	3	2
24.	3	2	1	1	1	1	1	1	1	2
25.	2	3	2	1	2	1	1	1	3	2
26.	2	3	2	3	2	3	2	2	3	2
27.	3	3	2	2	3	2	2	2	3	2
28.	2	3	2	3	2	3	2	2	2	2
29.	3	3	2	3	3	2	3	2	2	3
30.	2	3	2	2	2	2	2	2	3	2

(a) Note: A = Inquirers; B = Knowledgeable; C = Critical Thinkers; D = Communicators; E = Risk-Takers; F = Principled; G = Caring; H = Open-Minded; I = Well-Balanced; J = Reflective. (b) Note: Likert Scores = 1 high to 5 low.

Table 2

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Posttest Student Self Assessment Learner Profile Likert Scores (a, b)

	A	B	C	D	E	F	G	H	I	J
1.	1	2	2	1	2	1	1	1	1	1
2.	2	3	2	2	2	2	1	3	1	2
3.	2	1	1	1	1	1	1	1	1	1
4.	1	2	1	1	2	1	1	2	1	2
5.	1	1	1	1	2	2	1	1	1	1
6.	2	2	1	1	1	1	1	1	1	1
7.	1	2	3	1	2	1	2	1	2	1
8.	2	1	1	2	1	2	2	2	2	2
9.	1	1	1	2	1	1	1	1	1	1
10.	2	2	2	1	2	1	1	1	1	1
11.	2	2	1	2	1	2	1	1	3	3
12.	2	2	2	2	2	1	1	2	2	2
13.	2	2	2	1	2	2	1	1	1	2
14.	2	2	2	3	4	3	2	2	1	4
15.	1	3	2	1	2	2	1	2	2	2
16.	2	3	2	1	1	1	1	1	2	1
17.	1	1	1	1	1	1	1	1	1	1
18.	2	1	1	1	2	2	1	1	1	1
19.	3	2	1	3	2	3	1	1	3	2
20.	2	3	2	2	1	1	1	1	3	2
21.	2	1	1	2	1	2	1	2	2	2
22.	1	1	1	1	1	1	1	1	1	1
23.	1	2	1	1	2	1	1	1	2	1
24.	2	1	1	1	2	2	1	1	1	2
25.	2	4	2	1	3	3	1	2	5	3
26.	2	3	3	2	2	2	2	3	1	3
27.	3	2	2	1	2	1	1	2	1	2
28.	1	1	1	2	1	2	1	1	2	1
29.	3	3	3	2	2	2	2	2	2	2
30.	1	2	1	1	2	2	1	1	2	2

(a) Note: A = Inquirers; B = Knowledgeable; C = Critical Thinkers; D = Communicators; E = Risk-Takers; F = Principled; G = Caring; H = Open-Minded; I = Well-Balanced; J = Reflective. (b) Note: Likert Scores = 1 high to 5 low.

Table 3

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Student Self Assessment Learner Profile Likert Scores (a, b)

	A	B	C	D	E	F	G	H	I	J
1.	2	2	1	2	1	2	1	2	2	1
2.	3	4	2	1	2	2	3	2	3	3
3.	2	3	1	2	1	2	1	2	4	3
4.	2	2	3	2	1	2	3	2	3	1
5.	4	4	4	2	2	3	3	4	2	3
6.	2	3	1	4	1	2	2	5	1	5
7.	2	4	1	2	1	2	1	2	3	2
8.	2	3	2	1	2	2	1	2	1	2
9.	2	3	3	2	2	1	1	1	1	1
10.	2	3	2	2	3	2	2	2	3	2
11.	2	3	2	2	2	2	2	2	2	2
12.	2	1	3	1	2	2	2	2	2	2
13.	2	1	2	1	1	1	1	1	1	1
14.	3	2	2	1	3	2	2	2	3	2
15.	4	5	4	4	4	3	3	3	5	5
16.	3	4	1	2	2	2	1	1	1	2
17.	2	2	1	3	1	2	1	1	3	3
18.	4	4	4	2	3	2	1	2	2	3
19.	1	1	1	1	1	1	2	1	2	1
20.	2	4	2	2	3	2	2	1	3	1
21.	3	3	3	4	2	3	2	3	2	2
22.	3	3	4	2	4	2	2	1	3	2
23.	2	2	1	2	3	2	1	2	3	1
24.	3	2	3	2	4	2	3	3	2	2
25.	2	3	2	2	3	4	4	1	3	4
26.	2	3	2	2	1	2	1	1	2	1
27.	2	3	2	2	2	2	2	2	2	2
28.	3	2	3	3	2	3	2	3	4	3
29.	3	3	2	4	2	2	2	3	2	2
30.	3	5	2	1	3	2	2	2	3	3

(a) Note: A = Inquirers; B = Knowledgeable; C = Critical Thinkers; D = Communicators; E = Risk-Takers; F = Principled; G = Caring; H = Open-Minded; I = Well-Balanced; J = Reflective. (b) Note: Likert Scores = 1 high to 5 low.

Table 4

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Posttest Student Self Assessment Learner Profile Likert Scores (a, b)

	A	B	C	D	E	F	G	H	I	J
1.	2	1	2	2	2	1	1	2	2	1
2.	2	2	1	2	2	2	2	4	3	4
3.	1	2	3	3	2	3	1	2	2	1
4.	2	2	3	3	2	3	3	3	3	2
5.	3	3	3	4	1	3	2	4	2	3
6.	2	3	1	2	1	2	2	4	1	1
7.	2	3	2	1	1	2	2	2	3	2
8.	2	1	1	2	2	1	2	2	2	1
9.	2	3	2	1	2	2	2	1	1	2
10.	2	2	1	1	1	1	1	1	1	2
11.	2	2	2	1	2	2	3	2	3	3
12.	2	2	2	2	3	3	3	2	3	3
13.	2	2	2	1	2	1	1	2	2	1
14.	2	2	3	1	1	1	2	2	2	2
15.	4	4	4	4	4	2	2	2	4	4
16.	3	2	2	2	1	2	1	2	2	1
17.	3	2	1	2	1	2	1	1	2	1
18.	2	3	2	1	1	1	1	2	1	2
19.	3	1	2	1	2	1	2	1	2	2
20.	2	1	2	1	1	2	2	1	2	1
21.	2	3	2	4	3	3	2	2	2	3
22.	2	2	1	1	2	2	1	1	1	2
23.	1	2	1	1	1	1	1	2	2	3
24.	2	2	3	2	2	2	3	2	1	2
25.	2	3	5	2	1	4	1	2	5	1
26.	1	1	2	1	2	4	2	1	2	4
27.	2	3	2	2	1	1	1	3	2	2
28.	2	1	1	2	1	2	2	2	1	2
29.	2	3	2	3	2	2	1	2	2	2
30.	2	3	2	2	1	2	3	2	5	3

(a) Note: A = Inquirers; B = Knowledgeable; C = Critical Thinkers; D = Communicators; E = Risk-Takers; F = Principled; G = Caring; H = Open-Minded; I = Well-Balanced; J = Reflective. (b) Note: Likert Scores = 1 high to 5 low.

Table 5

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Compared to Posttest Student Self Assessment Learner Profile Scores

Source of Data (a)	Pretest Scores Mean	*SD*	Posttest Scores (b) Mean	*SD*	Effect Size	*t*	*p*
A	2.30	(0.60)	1.73	(0.64)	0.91	-4.26	.0001***
B	3.00	(0.83)	1.93	(0.83)	1.28	-5.96	.0001***
C	2.10	(0.61)	1.57	(0.68)	0.82	-3.40	.001*
D	1.93	(0.64)	1.47	(0.63)	0.72	-3.75	.0004**
E	2.00	(0.98)	1.73	(0.69)	0.32	-1.31	.10 *ns*
F	1.93	(0.69)	1.63	(0.67)	0.44	-1.80	.04 *ns*
G	1.53	(0.63)	1.17	(0.38)	0.71	-3.61	.001*
H	1.73	(0.64)	1.43	(0.63)	0.47	-1.87	.04 *ns*
I	1.93	(0.74)	1.67	(0.92)	0.31	-1.55	.07 *ns*
J	1.70	(0.65)	1.73	(0.78)	0.04	0.21	.42 *ns*

(a) Note: A = Inquirers; B = Knowledgeable; C = Critical Thinkers; D = Communicators; E = Risk-Takers; F = Principled; G = Caring; H = Open-Minded; I = Well-Balanced; J = Reflective.

(b) Note: Negative *t* is in the direction of improvement.

*$p < .001$. **$p < .0004$. ***$p < .0001$.

Table 6

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Compared to Posttest Student Self Assessment Learner Profile Scores

	Pretest Scores		Posttest Scores (b)				
Source of Data (a)	Mean	*SD*	Mean	*SD*	Effect Size	*t*	*p*
A	2.47	(0.73)	2.10	(0.61)	0.55	-2.63	.01*
B	2.90	(1.06)	2.20	(0.81)	0.74	-4.03	.0002**
C	2.20	(1.00)	2.07	(0.94)	0.13	-0.61	.27 *ns*
D	2.10	(0.92)	1.90	(0.96)	0.21	-1.18	.12 *ns*
E	2.13	(0.97)	1.67	(0.76)	0.53	-2.14	.02 *ns*
F	2.10	(0.61)	2.00	(0.87)	0.13	-0.72	.24 *ns*
G	1.87	(0.82)	1.77	(0.73)	0.12	-0.62	.27 *ns*
H	2.03	(0.96)	2.03	(0.85)	0.00	0.00	.50 *ns*
I	2.43	(0.97)	2.20	(1.06)	0.22	-1.10	.14 *ns*
J	2.23	(1.10)	2.10	(0.96)	0.12	-0.52	.30 *ns*

(a) Note: A = Inquirers; B = Knowledgeable; C = Critical Thinkers; D = Communicators; E = Risk-Takers; F = Principled; G = Caring; H = Open-Minded; I = Well-Balanced; J = Reflective.

(b) Note: Negative *t* is in the direction of improvement.

*$p < .01$. **$p < .0002$.

Table 7

Girls and Boys Who Participated in the International Baccalaureate Primary Years Curriculum Posttest Compared to Posttest Student Self Assessment Learner Profile Scores

Source of Data (a)	Posttest Girls Mean	*SD*	Posttest Boys Mean	*SD*	Effect Size	*t*	*p*
A	1.73	(0.64)	2.10	(0.61)	0.59	-2.28	.01*
B	1.93	(0.83)	2.20	(0.81)	0.32	-1.26	.11 *ns*
C	1.57	(0.68)	2.07	(0.94)	0.61	-2.35	.01*
D	1.47	(0.63)	1.90	(0.96)	0.54	-2.07	.02 *ns*
E	1.73	(0.69)	1.67	(0.76)	0.08	0.36	.36 *ns*
F	1.63	(0.67)	2.00	(0.87)	0.48	-1.83	.04 *ns*
G	1.17	(0.38)	1.77	(0.73)	0.08	-4.00	.0001***
H	1.43	(0.63)	2.03	(0.85)	0.81	-3.11	.001**
I	1.67	(0.92)	2.20	(1.06)	0.53	-2.08	.02 *ns*
J	1.73	(0.78)	2.10	(0.96)	0.42	-1.62	.06 *ns*

(a) Note: A = Inquirers; B = Knowledgeable; C = Critical Thinkers; D = Communicators; E = Risk-Takers; F = Principled; G = Caring; H = Open-Minded; I = Well-Balanced; J = Reflective.

*$p < .01$. **$p < .001$. ***$p < .0001$.

Table 8

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Pretest and Posttest Reading, Math, Language, Science, and Social Studies Grades (a, b)

	Girls Pretest Grades					Girls Posttest Grades				
	A	B	C	D	E	A	B	C	D	E
1.	1	1	1	1	1	1	1	1	1	1
2.	2	1	1	1	2	1	1	2	1	1
3.	1	1	2	2	1	2	2	2	1	1
4.	2	1	3	2	1	2	1	3	1	2
5.	1	1	2	1	1	1	1	1	1	1
6.	1	1	1	2	1	1	1	1	1	1
7.	1	2	2	1	1	1	1	2	1	1
8.	1	1	1	1	1	1	1	1	1	1
9.	1	1	1	1	1	1	1	1	1	1
10.	1	1	1	2	1	1	1	1	1	1
11.	1	1	1	1	1	1	1	1	1	1
12.	2	2	2	2	1	1	1	2	1	1
13.	1	1	1	1	1	1	1	1	1	1
14.	1	2	1	1	2	2	1	2	1	2
15.	2	1	3	3	2	2	2	2	1	2
16.	1	1	1	2	1	1	1	1	1	1
17.	1	2	1	2	2	2	2	2	2	1
18.	1	1	1	1	1	1	2	1	1	1
19.	2	3	2	3	2	2	3	2	3	2
20.	1	2	1	1	1	1	1	1	1	1
21.	1	1	1	1	1	1	1	1	2	2
22.	1	2	1	1	1	1	2	1	1	1
23.	2	1	2	2	1	1	1	2	2	1
24.	1	1	1	1	1	1	1	1	1	1
25.	2	2	2	2	2	2	2	3	3	1
26.	2	2	1	1	1	2	2	2	1	2
27.	2	2	2	2	1	2	2	2	2	2
28.	3	2	2	3	2	2	2	2	2	2
29.	1	1	1	1	1	1	1	1	1	1
30.	2	2	1	2	1	1	2	1	1	1

(a) Note: A = Reading; B = Math; C = Language; D = Science; E = Social Studies. (b) Note: 1 high to 5 low.

Table 9

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Pretest and Posttest Reading, Math, Language, Science, and Social Studies Grades (a, b)

	Boys Pretest Grades					Boys Posttest Grades				
	A	B	C	D	E	A	B	C	D	E
1.	1	1	1	1	1	1	1	1	1	1
2.	2	1	2	2	1	2	2	2	1	2
3.	1	2	2	1	1	1	1	2	1	1
4.	1	1	1	1	1	1	1	1	1	1
5.	2	2	3	2	1	3	2	3	1	2
6.	2	2	1	3	1	1	2	2	1	1
7.	1	1	1	2	1	1	1	1	1	1
8.	1	1	1	1	1	1	1	1	1	1
9.	1	1	1	1	1	1	1	1	1	1
10.	2	1	1	2	1	1	2	2	1	1
11.	1	2	1	2	1	1	1	1	1	1
12.	2	3	3	2	1	2	3	3	1	1
13.	1	1	1	2	3	2	2	2	1	1
14.	1	1	1	1	2	1	1	1	1	1
15.	1	2	2	3	1	2	1	2	1	1
16.	1	2	2	3	2	2	2	2	2	1
17.	2	1	2	3	2	1	2	3	1	1
18.	2	3	1	2	2	1	2	2	1	1
19.	1	2	1	1	1	1	2	2	1	1
20.	1	2	1	2	1	1	2	1	1	1
21.	2	2	3	2	2	2	2	2	3	2
22.	2	2	2	1	1	2	2	2	2	1
23.	1	1	1	1	1	1	1	1	1	1
24.	2	2	2	2	1	1	1	2	2	2
25.	2	2	2	2	1	2	2	2	3	1
26.	2	1	1	1	1	1	2	2	1	1
27.	2	2	2	2	1	1	1	2	1	1
28.	3	3	2	2	2	2	3	3	2	2
29.	4	3	2	3	3	2	2	3	2	2
30.	1	1	1	1	1	1	1	1	1	1

(a) Note: A = Reading; B = Math; C = Language; D = Science; E = Social Studies. (b) Note: 1 high to 5 low.

Table 10

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Compared to Posttest Academic Grades

	Pretest Scores		Posttest Scores (b)				
Source of Data (a)	Mean	*SD*	Mean	*SD*	Effect Size	*t*	*p*
A	1.40	(0.56)	1.33	(0.48)	0.13	-0.70	.24 *ns*
B	1.43	(0.57)	1.40	(0.56)	0.05	-0.37	.36 *ns*
C	1.43	(0.63)	1.53	(0.63)	0.15	1.14	.13 ns
D	1.57	(0.68)	1.30	(0.60)	0.42	-2.28	.01*
E	1.23	(0.43)	1.27	(0.45)	0.09	0.37	.36 *ns*

(a) Note: A = Reading; B = Language; C = Math; D = Science; E = Social Studies.

(b) Note: Negative *t* is in the direction of improvement.

*$p < .01$.

Table 11

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Compared to Posttest Academic Grades

	Pretest Scores		Posttest Scores (b)				
Source of Data (a)	Mean	*SD*	Mean	*SD*	Effect Size	*t*	*p*
A	1.60	(0.72)	1.40	(0.56)	0.31	-1.53	.07 *ns*
B	1.70	(0.70)	1.63	(0.61)	0.10	-0.57	.29 *ns*
C	1.57	(0.68)	1.83	(0.70)	0.37	2.80	.004*
D	1.80	(0.71)	1.30	(0.60)	0.76	-3.34	.001**
E	1.33	(0.61)	1.23	(0.50)	0.18	-0.90	.19 *ns*

(a) Note: A = Reading; B = Language; C = Math; D = Science; E = Social Studies.

(b) Note: Negative *t* is in the direction of improvement.

*$p < .004$. **$p < .001$.

Table 12

Girls and Boys Who Participated in the International Baccalaureate Primary Years Curriculum Posttest Compared to Posttest Academic Grades

Source of Data (a)	Posttest Girls Mean	*SD*	Posttest Boys Mean	*SD*	Effect Size	*t*	*p*	
A	1.33	(0.48)	1.40	(0.56)	0.13	-0.49	.31	*ns*
B	1.40	(0.56)	1.63	(0.61)	0.39	-1.53	.07	*ns*
C	1.53	(0.63)	1.83	(0.70)	0.45	-1.75	.04	*ns*
D	1.30	(0.60)	1.30	(0.60)	0.00	0.00	.50	*ns*
E	1.27	(0.45)	1.23	(0.50)	0.08	0.27	.39	*ns*

(a) Note: A = Reading; B = Language; C = Math; D = Science; E = Social Studies.

Table 13

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Life Skills Ratings (a, b)

	A	B	C	D	E	F
1.	2	1	1	2	2	2
2.	2	2	2	2	2	2
3.	2	2	2	2	2	2
4.	2	2	2	2	2	2
5.	2	2	2	2	2	2
6.	2	2	2	2	2	2
7.	2	2	2	2	2	2
8.	2	2	2	2	2	2
9.	2	2	2	2	2	2
10.	2	2	2	2	2	2
11.	2	2	2	2	2	2
12.	2	2	2	2	2	2
13.	2	2	2	2	2	2
14.	2	2	2	2	2	2
15.	2	2	2	2	2	2
16.	2	2	2	2	2	2
17.	2	2	2	2	2	2
18.	2	2	2	2	2	2
19.	2	2	2	2	2	2
20.	2	2	2	2	2	2
21.	2	2	2	2	2	2
22.	2	2	2	2	2	2
23.	2	2	2	2	2	2
24.	2	2	2	2	2	2
25.	2	2	2	2	2	2
26.	2	2	2	2	2	2
27.	2	2	2	2	2	2
28.	2	2	2	2	2	2
29.	2	2	2	2	2	2
30.	2	2	2	2	2	2

(a) Note: A = Cooperating with Others; B = Trustworthy and Honest; C = Positive Attitude; D = Respects Individual Differences; E = Respects the Rights of Others; F = Uses Kind Words, Actions. (b) Note: Likert Scores = 1 high to 5 low.

Table 14

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Posttest Life Skills Ratings (a, b)

	A	B	C	D	E	F
1.	1	1	2	2	2	1
2.	2	2	2	2	2	2
3.	2	1	2	2	2	2
4.	1	1	1	2	2	2
5.	2	1	1	2	2	2
6.	1	1	1	1	1	1
7.	1	1	1	1	1	1
8.	2	1	1	1	1	2
9.	1	1	1	1	1	1
10.	1	1	1	1	1	1
11.	1	1	2	1	1	1
12.	1	1	2	1	2	1
13.	1	1	1	1	1	1
14.	2	1	2	2	2	2
15.	1	1	1	1	1	1
16.	2	2	2	2	2	2
17.	2	2	2	2	2	2
18.	2	2	2	2	2	2
19.	2	2	2	2	2	2
20.	2	2	2	2	2	2
21.	2	2	2	2	2	2
22.	2	2	2	2	2	2
23.	2	2	2	2	2	2
24.	2	2	2	2	2	2
25.	2	2	2	2	2	2
26.	2	2	2	2	2	2
27.	2	2	2	2	2	2
28.	2	2	1	2	2	2
29.	2	2	1	2	2	2
30.	1	2	1	2	2	1

(a) Note: A = Cooperating with Others; B = Trustworthy and Honest; C = Positive Attitude; D = Respects Individual Differences; E = Respects the Rights of Others; F = Uses Kind Words, Actions. (b) Note: Likert Scores = 1 high to 5 low.

Table 15

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Life Skills Ratings (a, b)

	A	B	C	D	E	F
1.	2	2	2	2	2	2
2.	2	2	2	2	2	2
3.	2	2	2	2	2	2
4.	2	2	2	2	2	2
5.	2	2	2	2	2	2
6.	2	2	2	2	2	2
7.	2	2	2	2	2	2
8.	2	2	2	2	2	2
9.	2	2	2	2	2	2
10.	2	2	2	2	2	2
11.	2	2	2	2	2	2
12.	2	2	2	2	2	2
13.	2	2	2	2	2	2
14.	2	2	2	2	2	2
15.	2	2	2	2	2	2
16.	2	2	2	2	2	2
17.	2	2	2	2	2	2
18.	2	2	2	2	2	2
19.	2	2	2	2	2	2
20.	2	2	2	2	2	2
21.	3	3	2	2	2	3
22.	2	2	2	2	2	2
23.	2	2	2	2	2	2
24.	2	2	2	2	2	2
25.	2	2	2	2	2	2
26.	2	2	2	2	2	2
27.	2	2	2	2	2	2
28.	3	2	3	2	2	2
29.	2	2	2	2	2	2
30.	2	2	2	2	2	2

(a) Note: A = Cooperating with Others; B = Trustworthy and Honest; C = Positive Attitude; D = Respects Individual Differences; E = Respects the Rights of Others; F = Uses Kind Words, Actions. (b) Note: Likert Scores = 1 high to 5 low.

Table 16

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Posttest Life Skills Ratings (a, b)

	A	B	C	D	E	F
1.	2	1	1	2	2	1
2.	2	1	2	2	2	2
3.	2	2	2	2	2	2
4.	2	2	2	2	2	2
5.	4	2	2	2	2	2
6.	1	1	1	1	2	1
7.	1	1	1	1	1	1
8.	1	1	1	1	1	1
9.	1	1	1	1	1	1
10.	1	1	1	1	1	1
11.	2	1	2	2	2	2
12.	2	1	2	2	2	1
13.	1	1	1	1	2	1
14.	1	1	1	1	2	2
15.	1	1	2	1	1	1
16.	2	2	2	2	2	2
17.	2	2	2	2	2	2
18.	2	2	1	2	2	2
19.	2	2	2	2	2	2
20.	2	2	2	2	2	2
21.	4	4	2	2	4	4
22.	2	2	2	2	2	2
23.	2	2	2	2	2	2
24.	2	2	2	2	2	2
25.	2	2	2	2	2	2
26.	1	2	2	2	2	2
27.	1	2	2	2	2	2
28.	2	2	2	2	2	2
29.	2	2	2	2	2	2
30.	2	2	2	2	2	2

(a) Note: A = Cooperating with Others; B = Trustworthy and Honest; C = Positive Attitude; D = Respects Individual Differences; E = Respects the Rights of Others; F = Uses Kind Words, Actions. (b) Note: Likert Scores = 1 high to 5 low.

Table 17

Girls Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Compared to Posttest Life Skills Ratings

	Pretest Scores		Posttest Scores (b)				
Source of Data (a)	Mean	*SD*	Mean	*SD*	Effect Size	*t*	*p*
A	2.00	(0.00)	1.63	(0.49)	1.51	-4.10	.0002***
B	1.97	(0.18)	1.53	(0.51)	1.27	-4.71	.00003****
C	1.97	(0.18)	1.60	(0.50)	1.08	-3.61	.001*
D	2.00	(0.00)	1.70	(0.47)	1.27	-3.53	.001*
E	2.00	(0.00)	1.73	(0.45)	1.20	-3.25	.001*
F	2.00	(0.00)	1.67	(0.48)	1.37	-3.81	.0003**

(a) Note: A = Cooperating with Others; B = Trustworthy and Honest; C = Positive Attitude; D = Respects Individual Differences; E = Respects the Rights of Others; F = Uses Kind Words, Actions.

(b) Note: Negative *t* is in the direction of improvement.

*$p < .001$. **$p < .0003$. ***$p < .0002$. ****$p < .00003$.

Table 18

Boys Who Participated in the International Baccalaureate Primary Years Curriculum Pretest Compared to Posttest Life Skills Ratings

	Pretest Scores		Posttest Scores (b)				
Source of Data (a)	Mean	*SD*	Mean	*SD*	Effect Size	*t*	*p*
A	2.07	(0.25)	1.80	(0.76)	0.53	-2.11	.02 *ns*
B	2.03	(0.18)	1.67	(0.66)	0.85	-3.61	.001*
C	2.03	(0.18)	1.70	(0.47)	1.01	-3.81	.0003***
D	2.00	(0.00)	1.73	(0.45)	1.20	-3.25	.001*
E	2.00	(0.00)	1.90	(0.55)	0.18	-1.00	.16 *ns*
F	2.03	(0.18)	1.77	(0.63)	0.64	-2.80	.004**

(a) Note: A = Cooperating with Others; B = Trustworthy and Honest; C = Positive Attitude; D = Respects Individual Differences; E = Respects the Rights of Others; F = Uses Kind Words, Actions.

(b) Note: Negative *t* is in the direction of improvement.

*$p < .001$. **$p < .004$. ***$p < .0003$.

Table 19

Girls and Boys Who Participated in the International Baccalaureate Primary Years Curriculum Posttest Compared to Posttest Life Skills Ratings

Source of Data (a)	Posttest Girls Mean	*SD*	Posttest Boys Mean	*SD*	Effect Size	*t*	*p*	
A	1.63	(0.49)	1.80	(0.76)	0.27	-1.01	.16	*ns*
B	1.53	(0.51)	1.67	(0.66)	0.85	-0.23	.19	*ns*
C	1.60	(0.50)	1.70	(0.47)	0.20	-0.80	.21	*ns*
D	1.70	(0.47)	1.73	(0.45)	0.06	-0.28	.39	*ns*
E	1.73	(0.45)	1.90	(0.55)	0.34	-1.29	.10	*ns*
F	1.67	(0.48)	1.77	(0.63)	0.18	-0.69	.25	*ns*

(a) Note: A = Cooperating with Others; B = Trustworthy and Honest; C = Positive Attitude; D = Respects Individual Differences; E = Respects the Rights of Others; F = Uses Kind Words, Actions.

CHAPTER FIVE

Conclusions and Discussion

The purpose of this study was to determine the impact of a founding yearlong school wide International Baccalaureate Primary Years Programme (IBPYP) curriculum on intermediate grade level girls' perceptions of their learned global citizenship attributes compared to intermediate grade level boys' perceptions of their learned global citizenship attributes.

Independent Variable Descriptions

Girls and boys completed classes starting at 8:45 a.m. and ending at 3:30 p.m. Monday through Friday. All students were required to complete the same courses including: (a) reading/writing/language arts, (b) mathematics, (c) social studies, (d) science, (e) Spanish, (f) physical education, (g) music, (h) art, and (i) technology. The 10 IBPYP attributes were infused in all lessons. School visuals, in hallways and in classrooms, supported incidental and direct learning of the 10 IB attributes. Expectations for girls' and boys' academic achievement and deportment based on the 10 IB attributes were the same. All classes, including physical education, were coeducational. The research school has recently completed an international accreditation

review of its IB early years programme and is waiting for the final written IB authorization report.

Dependent Measures

Dependent measures included a 10 IB attributes student profile, course grades, and life skills. The Student profile was analyzed using the Student Self Assessment Learner Profile survey. Data was collected retrospectively.

Achievement data were collected retrospectively and were analyzed using the dependent measure of report card grades for: (a) Reading, (b) Math, (c) Language, (d) Science, and (e) Social Studies.

Life skills data were collected retrospectively using teacher ratings of girls and boys on Life Skills for: (a) Cooperating with Others, (b) Trustworthy and Honest, (c) Positive Attitude, (d) Respects Individual Differences, (e) Respects the Rights of Others, and (f) Uses Kind Words, Actions.

Conclusions

Research Question #1

Research Question #1a. Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile did significantly improve their Inquires,

Knowledgeable, Critical Thinkers, Communicators, and Caring scores. Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile did not significantly improve their Risk Takers, Principled, Open Minded, Well Balanced and Reflective scores. Pretest-posttest results for nine of the ten subtest domain areas were in the direction of improvement with lower scores at posttest yielding negative *t* test results. Reflective results were in the direction of a higher but not statistically significantly different posttest score. All posttest girls Student Self Assessment Learner Profile subtest mean scores ranged from 1.93 to 1.17 representing student agree to strongly agree responses. Given the consistent *t* test results in the direction of improvement for nine of the ten subtests and the consistency of scores in the agree to strongly agree range it may be said that girls responded positively to the IB learner attributes curriculum.

Research Question #1b. Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment

Learner Profile did significantly improve their Inquires and Knowledgeable scores. Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest Student Self Assessment Learner Profile did not significantly improve their Critical Thinkers, Communicators, Risk Takers, Principled, Caring, Open Minded, Well Balanced, and Reflective scores. Pretest-posttest results for nine of the ten subtest domain areas were in the direction of improvement with lower scores at posttest yielding negative *t* test results. Open-Minded results yielded identical pretest and posttest mean scores. Posttest boys Student Self Assessment Learner Profile subtest mean scores ranged from 2.20 to 1.67 representing student agree, seven subtests, to strongly agree, three subtests, responses. Given the consistent *t* test results in the direction of improvement for nine of the ten subtests and the consistency of scores in the agree range it may be said that boys responded positively to the IB learner attributes curriculum.

Research Question #2

Overall, the girls posttest Student Self Assessment Learner Profile scores on nine subtests were lower than the boys posttest scores, in the strongly agree range, for:

Inquirers, Knowledgeable, Critical Thinkers, Communicators, Principled, Caring, Open-Minded, Well-Balanced, and Reflective. However, the boys posttest Student Self Assessment Learner Profile score on one subtest was lower than the girls posttest score, in the strongly agree range, for: Risk-Takers. Given the consistently lower mean score results in nine out of ten subtests and reported statistical difference for four of the posttest subtest areas measured--Inquirers, Critical Thinkers, Caring, and Open-Minded--indicates that girls self reported benefit after participating in the IB curriculum may be considered somewhat greater than boys self reported benefit.

Research Question #3

Research Question #3a. Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did significantly improve their Science score at posttest and had grades in the direction of improvement for Reading, Language, and Science. Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did not significantly improve their Math and Social Studies grades at posttest. Pretest-posttest results for three of

the five academic grade areas Reading, Language, and Science were in the direction of improvement with lower scores at posttest yielding negative *t* test results. Math and Social Studies grade results were in the direction of a higher but not statistically significantly different posttest score. All posttest academic area mean grade scores ranged from 1.53 to 1.27 representing grades within the A range. Given the consistency of the posttest grades across all academic areas and considering that the pretest grades, ranging from 1.57 to 1.23, that were within the A range, it may be said that girls responded positively to the IB learner attributes curriculum.

Research Question #3b. Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did significantly improve their Science score at posttest and had grades in the direction of improvement for Reading, Language, Science, and Social Studies. Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum pretest compared to posttest did not significantly improve their Reading, Language, Math (statistically significantly different in the direction of a worsening grade) and Social Studies

grades at posttest. Pretest-posttest results for four of the five academic grade areas Reading, Language, Science, and Social Studies were in the direction of improvement with lower scores at posttest yielding negative *t* test results. All posttest academic area mean grade scores ranged from 1.83 to 1.23 representing grades within the A range. Given the consistency of the posttest grades across all academic areas and considering that the pretest grades, ranging from 1.80 to 1.33, that were within the A range, it may be said that boys responded positively to the IB learner attributes curriculum.

Research Question #4

Overall, the girls' posttest grade scores on three of the five subtests measured were lower than the boys' posttest grade scores, in the direction of a grade of A, including Reading, Language, and Math. Boys' posttest grade score on one of the five subtests measured was lower than the girls' posttest grade score, in the direction of a grade of A, for Social Studies. Girls' and boys' posttest mean scores, in the direction of a grade of A, for Science were identical. The null hypothesis was not rejected for any of the five posttest girls' versus posttest boys' academic grade comparisons. Therefore, it may be said that girls and boys classroom performance in Reading, Language,

Math, Science, and Social Studies as reflected by their grade results, awarded by their teachers, indicated that girls and boys seemed to have equally benefited from participation in the IB curriculum.

Research Question #5

Research Question #5a. Overall, pretest-posttest results indicated that girls who participated in the International Baccalaureate Primary Years Curriculum did statistically significantly improve their Life Skills ratings for all six subtests Cooperating with Others, Trustworthy and Honest, Positive Attitude, Respects Individual Differences, Respects the Rights of Others, and Uses Kind Words, Actions. All posttest Life Skills mean ratings ranged from 1.73 to 1.53 representing ratings within the Exceeds Expectations range. Given the consistency of the posttest Life Skills mean ratings across all Life Skills areas and considering that the pretest Life Skills mean ratings, ranging from 2.00 to 1.97, that were for the most part within the Satisfactory/Meet Expectations range, it may be said that girls responded positively to the IB learner attributes curriculum.

Research Question #5b. Overall, pretest-posttest results indicated that boys who participated in the International Baccalaureate Primary Years Curriculum did

statistically significantly improve their Life Skills ratings for four subtests Trustworthy and Honest, Positive Attitude, Respects Individual Differences, and Uses Kind Words, Actions. Boys who participated in the International Baccalaureate Primary Years Curriculum did not statistically significantly improve their Life Skills ratings for two subtests Cooperating with Others and Respects the Rights of Others. All posttest Life Skills mean ratings ranged from 1.80 to 1.67 representing ratings within the Exceeds Expectations range. Given the consistency of the posttest Life Skills mean ratings across all Life Skills areas and considering that the pretest Life Skills mean ratings, ranging from 2.07 to 2.00, that were for the most part within the Satisfactory/Meet Expectations range, it may be said that boys responded positively to the IB learner attributes curriculum.

Research Question #6

Overall, the girls' posttest Life Skills ratings on all six subtests were lower than the boys' posttest Life Skills ratings, in the direction of Exceeds Expectations, including Cooperating with Others, Trustworthy and Honest, Positive Attitude, Respects Individual Differences, Respects the Rights of Others, and Uses Kind Words, Actions. The null hypothesis was not rejected for any of

the six posttest girls' versus posttest boys' Life Skills ratings comparisons. Therefore, it may be said that girls and boys Life Skills reflected by their Life Skills ratings in Cooperating with Others, Trustworthy and Honest, Positive Attitude, Respects Individual Differences, Respects the Rights of Others, and Uses Kind Words, Actions, awarded by their teachers, indicated that girls and boys equally benefited from participation in the IB curriculum.

Discussion

Self-perception. Elementary girls more often than not rate themselves as having positive performance on the affective aspects of growing up such as caring or being tender-minded (Feingold, 1994). Females are more likely than males to express feelings of warmth, pity, or sadness than their male counterparts (Feingold, 1994). Males are more likely than females to express emotions associated with competition (Oliver, 1998) and they are found to be more aggressive than females (Feingold, 1994). Boys are traditionally bigger risk-takers than girls (Jelicic, Bobek, Phelps, Lerner & Lerner, 2007); however, there is no reported gender difference on impulsivity (Feingold, 1994).

In this study girls' performance was consistent with the above views where girls reported greater capacity to

express emotion than boys, and a statistically significant difference was reported in the area of caring, with girls reporting a greater capacity for caring compared to boys on this domain of the IBPYP Student Self Assessment Learner Profile. The null hypothesis was not rejected for boys' and girls' reported levels of risk-taking behavior running counter to literature suggesting that boys are *ipso facto* bigger risk-takers than girls.

Academic Progress. According to Feingold (1992) while boys score higher on standardized achievement tests in general knowledge, mechanical reasoning, and mental rotations than girls, females score higher than males on tests of language usage (spelling, grammar) and perceptual speed. There are no notable sex differences reported in general verbal ability, arithmetic, abstract reasoning, spatial visualization and memory span (Feingold, 1992). Furthermore, boys reportedly are more likely than girls to aspire to scientific careers following their initial science interests than girls (Lee, 1998). Moreover, within the field of science, women elect more often to pursue careers as physicians, whereas men elect more often to become engineers (Lee, 1998).

However, in this study a greater advantaged classroom performance was not consistent with the research literature

positing a stronger classroom performance in Language Arts (reading and writing) for girls compared to boys or a greater advantaged classroom performance in Science and Math for boys compared to girls. Overall, statistical equipoise was observed for all academic comparisons including Reading, Language, Math, Science, and Social Studies teacher ratings of girls' and boys' classroom performance. The study seemed to affirm the assertion that cognitive and performance differences between girls and boys may be disappearing over time (Feingold, 1992).

Teacher Ratings. Caution must be used when making generalizations about girls' and boys' abilities in subject areas that are based on teachers' ratings. In some instances teachers' ratings have been influenced by behavior not associated with skill development per se (O'Connor, 2002). For instance, girls tend to be more persistent and able to sit still for longer periods of time than boys (Hong & Lee, 1999) thus teachers may structure their teaching in a way that is more positive for girls (McNeil, 1964) resulting in higher grades for girls than for boys. Sax (2005) found that teachers treat boys differently than they treat girls, making more negative comments to boys particularly in reading classes. Perhaps due to the consistency of the school wide IBPYP curriculum

and required IB teacher training, teachers' grading procedures in this study were fairly and objectively administered.

Closing Observations

Further research. Further research might compare boys and girls as they mature and participate in the IB middle years and the high school IB diploma program to determine the progress of these students over time and their overall preparedness for post-secondary studies. It will also be important to determine if the IBPYP could provide successful learning experiences to students of academic and economic need.

Personal reflection. Finally, from the perspective of an IBPYP school leader it seems that the study data and results indicate that girls and boys alike are well served by the elementary IBPYP curriculum. Program development in the years to come could proceed from this blueprint even as the program opens itself up to an increasingly racially and economically diverse student body.

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APPENDIX A

School District Letter of Research Approval.

Memo

To: Suzanne Melliger

From: Jon T. Lopez.

CC: ad hoc committee

Date: 5/22/2008

Re: Research Application

The ad hoc committee met and reviewed your proposal to conduct research in Millard Public Schools. We are pleased to inform you that your research has been approved. You may begin your research immediately. At the conclusion of your study, the Office of Planning and Evaluation will require a copy of your dissertation.